So what does all this mean for us?

Even if technology is creating this isolation, we will be able to use technology to reconnect the world by breaking and surpassing existing models.

By exploring how these technologies work together, we can break free from habitual, almost machine-like behavior and finally find common ground with each other.

Technology is never neutral.

It provides context and frames reality.

It's part of the problem and part of the solution.

We can use this to uncover our blind spots and retrain our perceptions so that we can choose how we view each other.

thank you.

(applause)

During the break, several people asked me about my comments on the aging debate.

And this will be my only comment on it.

So, I understand that optimists live much longer than pessimists.

(Laughter) What I'm going to talk about in 18 minutes is how we're going to switch from reading the genetic code to starting to write the code ourselves in the first place.

Exactly 10 years ago this month, we published the first sequence of the free-living Haemophilus influenzae.

This has reduced the duration of the genome project from 13 years to 4 months.

We can now run the same genome project in 2-8 hours.

Over the past decade, a large number of genomes have been added, including most human pathogens, some plants, some insects, and some mammals that contain human genomes.

A little over a decade ago, at this stage of genomics, it was thought that by the end of this year, three to five genomes might be sequenced. That's on the order of hundreds.

We just received a grant this year from the Gordon & Betty Moore Foundation to sequence 130 genomes as a side project from Environmental Biology.

In other words, the speed at which the genetic code is read has changed.

But as we look at what's out there, we've only scratched the surface of what's available on this planet.

Most people don't realize it because they're invisible, but microbes make up about half of the Earth's biomass, while all animals make up about 1/1,000 of the total biomass.

It may not be something many people in Oxford do, but if you go to the ocean and take a gulp of seawater, keep in mind that every milliliter contains about 1 million bacteria and on the order of 10 million viruses.

As of two years ago, less than 5,000 microbial species have been characterized, and we decided to do something about it.

Then we launched the Sorcerer II Expedition, attempting to sample the ocean every 200 miles, similar to a large ocean survey.

We started in Bermuda for a test project, then moved to Halifax, the US East Coast, the Caribbean Sea, the Panama Canal, the Galapagos, across the Pacific, and now crossing the Indian Ocean.

It's a very tough duty. We do this on sailboats, and one of the purposes is to get young people interested in science.

Experimenting is incredibly easy.

We can take seawater, filter it, collect organisms of different sizes through different filters, and bring their DNA back to a lab in Rockville where we can sequence 100 million letters of the genetic code every 24 hours.

And in doing this I made some surprising discoveries.

For example, the visual pigments in our eyes were thought to exist in only one or two organisms with these same pigments in the environment.

Nearly all species inhabiting the upper reaches of the world's warmer oceans have these same photoreceptors and use sunlight as a source of energy and communication.

In one location, one barrel of seawater, 1.3 million new genes and 50,000 new species were discovered.

We received a grant from the Sloan Foundation to extend this to broadcasting.

We measure how many viruses and germs we all inhale and exhale each day, especially on airplanes and in enclosed auditoriums.

(Laughter) We filter through some simple equipment. We collect a billion microbes in just one day of filtration on the roof of a building in New York City.

And now we are working out the order of all of them.

In terms of data collection, where we pass through the Galapagos Islands, we find tremendous diversity in sea samples almost every 200 miles.

Some of these make logical sense in terms of different temperature gradients.

This is a satellite image based on temperature. Red indicates warm and blue indicates cold. And we found significant differences between the hot and cold water samples in terms of species abundance.

Another thing that surprised us quite a bit is that these photoreceptors can detect different wavelengths of light and predict it based on their amino acid sequences.

And these vary greatly by region.

Perhaps unsurprisingly, in the deep sea, where most of the water is blue, photoreceptors tend to perceive blue light.

If you have a lot of chlorophyll around you, you will see a lot of green light.

However, they are changing further and can be extreme towards the infrared and ultraviolet.

In an attempt to assess what our genetic repertoire is, we collected all the data, including all the data ever obtained from the expedition, representing more than half of all genetic data on Earth. The total was approximately 29 million genes.

We then applied these to gene families to try to see what these findings were. Are we simply discovering new members of known families, or are we discovering new families?

And it turns out that we have about 50,000 major gene families, but these new families are linearly added each time we take a new sample in the environment.

So we are in the early stages of discoveries about the basic genes, building blocks and life on this planet.

If you look at the so-called evolutionary tree, you will find an animal in the upper right corner.

Out of about 29 million genes, our genome has only about 24,000.

And all animals together probably share less than 30,000, perhaps a dozen or more different gene families.

I believe that these genes are now more than just evolutionary design elements.

And we think in a gene-centric way, perhaps going back to Richard Dawkins thinking, rather than a genome-centric way of thinking that is the different construction of these genetic components.

Synthetic DNA, or the ability to synthesize DNA, is changing at about the same pace as DNA sequencing has been over the last 10-20 years, getting very fast and very cheap.

Our first thoughts on synthetic genomics came in 1995 when we sequenced the second genome from Mycoplasma genitalium.

And there's a really nice T-shirt that says, "I love my genitals."

Actually, it's just microbes.

But there are about 500 genes.

Haemophilus had 1,800 genes.

And we simply asked. If you need 800 of one species and 500 of another, is there a smaller set of genes that could make up a minimal operating system?

So we started transposon mutagenesis.

A transposon is simply a small piece of DNA that randomly inserts into the genetic code.

And when they are inserted in the middle of the gene, their function is destroyed.

We therefore created a map of all genes that could undergo transposon insertion and called them 'non-essential genes'.

However, the environment turns out to be very important for this, and we can only define essential or non-essential genes based on what is in the environment.

We also tried a more direct intellectual approach to the genomes of 13 related organisms, comparing them all to see what they had in common.

And we got these overlapping circles. They found only 173 genes common to all 13 organisms.

Ignoring one intracellular parasite, the pool expanded slightly. The range is even wider when we focus on a core set of ~310 or so genes.

So, depending on your point of view here, we believe the genome can grow or shrink from a minimum of 500 genes to perhaps 300-400 genes.

The only way to prove these ideas was to construct artificial chromosomes containing those genes, which had to be done in a cassette-based manner.

Synthesizing accurate DNA from large pieces proved to be very difficult.

My colleagues on this work, Ham Smith and Clyde Hutchison, have developed an exciting new method to synthesize 100% sequence- and biology-accurate 5,000-bp viruses in just two weeks.

This was a very exciting experiment. They took a piece of synthetic DNA and injected it into a bacterium, and suddenly the DNA began to drive the production of viral particles, which turned around and killed the bacterium.

It wasn't the first synthetic virus, but the poliovirus, which had been made a year earlier, was only 10,000 times less active and took three years to synthesize.

A cartoon of the structure of the Phi X174.

This is a case of software building its own hardware, and this is our conception in biology.

People are quick to jump on concerns about biowarfare, but I recently testified before a Senate committee and a special committee set up by the U.S. government to look into this area.

And I think it's important to keep reality in mind, not what happens in people's imaginations.

Basically any virus that is sequenced today can have its genome made.

And although people are quick to make a fuss about Ebola and smallpox, the organism's DNA is not contagious.

So even if someone created the smallpox genome, the DNA by itself would not cause infection.

Designer viruses are a real concern for security departments.

And only two countries, the United States and the former Soviet Union, actively engaged in the development of biological weapons.

If that research were really stopped, there would be little activity in the know-how for making designer viruses in the future.

I believe that single-celled organisms can be realized within two years.

And maybe the eukaryotic cells we have are feasible within a decade.

We are currently making dozens of different constructs because we can change the cassettes and genes that are integrated into this artificial chromosome.

What matters is how you arrange everything else.

There is a homologous recombination system that starts with these fragments and reassembles them into chromosomes.

It is derived from Deinococcus radiodurans, a microorganism that survives exposure to 3 million rads of radiation.

After this burst of radiation, the chromosomes are literally blown out, after which they rebuild the genome in about 12-24 hours.

These creatures are ubiquitous on Earth and are probably still in space today as a result of our travels through space.

This is a glass beaker after about 500,000 rads of radiation.

The glass started to burn and crack, but the microbes at the bottom became happier.

Here's a picture of what's actually happening. The upper part shows the genome after receiving 1.7 million rads of radiation.

Chromosomes are literally blown away.

And here is the same DNA automatically reassembled after 24 hours.

It's truly amazing that these organisms can do that, and there are probably thousands, if not tens of thousands, of different species on this planet that can do that.

After these genomes are synthesized, the first step is simply to transplant them into genome-less cells.

Therefore, we believe that synthetic cells have great potential not only for understanding the basics of biology, but also, hopefully, for environmental and social issues.

For example, the third microorganism we sequenced, Methanococcus jannaschii, lives at the temperature of boiling water. Its energy source is hydrogen, and all its carbon comes from CO2 captured from the environment.

So, we know that there are thousands of different organisms currently living off CO2 and capable of capturing it through different pathways.

So instead of using carbon from petroleum in synthetic processes, there is an opportunity to use carbon to capture it from the atmosphere and convert it into biopolymers and other products.

We have one living organism that breathes carbon monoxide, and as a reducing power, it breaks down water to produce hydrogen and oxygen.

Also, there are many pathways that can be designed to metabolize methane.

And DuPont is working with Norway's Statoil on a massive program to capture methane from gas fields and convert it into useful products.

I believe there will soon be a new field called “combinatorial genomics”. With these new synthetic capabilities, vast gene sequence repertoires, and homologous recombination, we could design robots that make perhaps a million different chromosomes a day.

Thus, as in all biology, selection is made through screening, whether for hydrogen production, chemical production, or just viability.

Understanding the role of these genes would be well within reach.

We are improving photosynthesis to produce hydrogen directly from sunlight.

Photosynthesis is regulated by oxygen, but we have oxygen-insensitive hydrogenases that we think completely alter this process.

It also combines cellulases, enzymes that break down complex sugars into simple sugars, and enzymes that ferment in the same cell to produce ethanol.

Major laboratories are already producing pharmaceuticals using microorganisms.

The chemistry we get from the compounds in our environment is orders of magnitude more complex than our best chemists can create.

I think future artificial organisms could replace food sources, hopefully energy sources, environmental remediation, and possibly the petrochemical industry.

I would like to conclude my study of ethics and policy here.

We delayed the start of the experiment in 1999 until we had completed a year-and-a-half bioethical review on whether we should attempt to create an artificial species.

All major religions took part in this.

It was actually a very strange study. Because various religious leaders were using their scriptures as their legal books, and I found nothing in them that prohibited the creation of life. So you should be fine. The only final concern was this aspect of biowarfare, but they gave me permission to start these experiments because we are doing them.

Now, the Sloan Foundation has just funded multi-institutional research on this issue to figure out what the risks and benefits are for society, and what rules scientific teams like myself should use in this area. And we try to set a good example moving forward.

These are complex issues.

Aside from the threat of bioterrorism, these are very simple questions, whether we can design something that produces clean energy, and perhaps revolutionize what developing countries can do and deliver through a variety of simple processes.

thank you very much.

So my grandfather said when I was little, "Say a word often, and it becomes you."

And having grown up in the segregated city of Baltimore, Maryland, I thought maybe I could use that idea to walk around America with a tape recorder, interview people, and follow their words—which is why I don't wear shoes when I perform—so I could absorb a certain kind of America.

I was also inspired by Walt Whitman, who absorbed America and wanted America to absorb him.

So these four characters will come from a piece I've been working on over the years. And I don't know if I've interviewed the thousands or more people I've interviewed.

Studs Terkel, is anyone old enough to know that old radioman?

So I thought he was the perfect person to go to ask about a defining moment in American history.

As you know, he was "born in 1912. The year the Titanic sank, the biggest ship ever built. Hit the tip of the iceberg, bang, sank. Sunk and I got up. Wow, centuries."

(Laughter) Here's his answer to a defining moment in American history.

“I don’t think there is a defining moment in American history.

The gradual slip--"slip" is the word the Watergate people used, the moral slip--it's a sort of gradual thing, a combination of things.

As you know, we have technology too.

I say it's becoming less and less human.

"Oh, let's talk about some fun games.

Atlanta airport is a modern airport, so you should exit the gate there.

A train that takes you from the concourse to your destination.

And these trains are smooth, quiet and efficient.

Then I heard a voice on the train, and it turns out it was a human voice.

There used to be robots, but robots imitated humans.

Now there are humans imitating robots.

On this train, I heard the following voices. Concourse 1: Omaha, Lincoln.

Concourse 2: Dallas, Fort Worth. Same voice.

Just as the train was about to leave, a young couple ran in and were just closing the pneumatic doors.

And the voice immediately said, "You are 30 seconds late because you entered late." At that time, everyone is looking at this couple with hatred, and the couple is shrinking like this.

Well, I happened to have a few drinks before boarding--I do it to brace myself--so I imitated the call of the train, holding my hand--"George Orwell, it's your turn."

Well, some people are laughing. People laugh when I say that, but not on this train. silence.

And suddenly they saw me.

So here I am with that couple, the three of us huddled at the foot of Calvary and about to wake up.

"At that moment, I saw a baby on its mother's lap.

She speaks Spanish to her companions, so you can tell she's Hispanic.

So let's talk to the baby. So I hold my hand over my mouth because my breath must be 100 proof and say to the baby, "Doctor or Madam, what do you think of humanity?"

I said, "Thank God for the human response. We are not defeated yet." "But the human touch is fading away.

As you know, you have to doubt the official truth.

You know how great Mark Twain is -- we know we admire Mark Twain, but we haven't read his books.

We read "Huck Finn", of course we read "Huck Finn".

Of course, the hack was great.

Great scene on the raft, remember what Huck did?

Look, here's a hack. He is an illiterate child. He has no schooling, but there is something in him.

And the official truth, truth, law is that black people were property and things.

And Huck boards a raft with a property named Jim, who is a slave.

And when he heard that Jim was going to take his wife and children and steal from the owner's lady, Huck said, "Oh my God, oh, oh, that woman, that woman never hurt anyone."

Oh he's gonna steal he is going to steal he will do terrible things Just then, two slave traders catch up, and the men are following the slaves in search of Jim.

"Is there anyone on the raft with you?" Huck says, "Yes." 'Is he black or white?' 'White. ' and they leave.

Then Huck said, "Oh my God, my God, I lied, I lied, oh I did a terrible thing, I did a terrible thing—why am I feeling so good?"

In other words, humanity is being lost.

So you ask about the defining moment, which for me is not the defining moment in American history.

It's an accumulation of moments, leading to the current situation where trivia is news.

And more and more, we become less and less aware of the pain of others.

teeth. I don't know if you can use this, but I quoted Nebraska writer Wright Morris. “We are becoming more and more interested in communicating and less and less interested in communicating.” Now, kids, I have to rush to see a cardiologist. ”

That is Stads Terkel.

(Applause) Now let's talk about risk-taking. I'm going to do it with someone no one likes.

Most actors want to play likeable characters. Not always, but especially at conferences like this, I like to inspire people.

But this was called "risk-taking," so I'm doing someone I'd never do, because she's so unlikely, someone actually came backstage and told me to take her out of the show she was on.

And I'm doing it to her because at conferences like this, risk is a good thing.

But the word "risk" has another connotation, and the word "natural" has the same meaning. what is nature?

Maxine Greene, a fine philosopher about Studs' age, who was head of a philosophy--a kind of great, great philosophical organization--I went up to her and asked her if there were two things she didn't know and still wanted to know.

And she said, "Well, personally I still feel like I have to bow when I see a university president.

And even though I've outlived most of my male co-workers, I still feel I have to drink coffee for them. ”

And she said, "And intellectually, I don't know enough about negative imagination.

And September 11th certainly taught us that it's an area we haven't explored. ”

In other words, this work is about negative imagination.

It raises questions about what nature is, what is mother nature, and what is risk.

And I got this at the Maryland Institute of Corrections for Women.

Everything I do is verbatim from the tape.

And I title things because I think people speak in organic poetry. This is called "mirror to her mouth".

This is a prisoner named Paulette Jenkins.

"I didn't want anyone to know this was going on in my house, so I started learning how to hide it.

I want everyone to think that we are a normal family.

I mean, we had all the material things, but that didn't ease my children's pain. Yet their fear did not subside.

I've run out of excuses as to why my eyes are black, my lips are cracked, and I have bruises. I had no more excuses.

And he hit me too. But that didn't change the fact that it was a nightmare for the family. it was a nightmare.

And I failed them dramatically as I let it go on and on.

"But the night Misha was killed, it got more intense, and one night when we came home with drugs, he got mad at Misha and started hitting her and pushing her into the bathtub. Oh, he'd use a belt.

He had the belt because he had the twisted perversion that Misha had sex with his brother and caressed each other - that's his reason.

I'm only talking about the specific night she died.

So he put her in the tub and I was in the bedroom with the baby.

"And four months before this happened, four months before Mischa died, I thought I could really cure this man. So I had a baby beside him — crazy — thinking that if I gave him my child, he would leave my child alone.

And it didn't work, it didn't work.

And I had three children: Houston, Misha, and Dominic, who was 4 months old when I got to prison.

"And I was in the bedroom. Like I said, he was taking her to the bathroom and every time he hit her she would fall.

Then she hit her head in the bathtub. It happened continuously and repeatedly.

I could hear it, but I dared not move. I didn't move.

I didn't even go to see what was going on.

I was just sitting there listening.

And he put her in the corridor.

He told her to just stay there. So she stayed there for about four or five hours.

And he said to her, "Get up."

Then he gets up and says he couldn't see.

She had scars on her face. She had black eyes.

The area around her head was just swollen. Her head was about twice the size of her own.

I said to him, "Please put her to bed." he put her to bed

"The next morning she was dead.

He entered the house to see if she was going to school and was very excited.

He said, "She won't breathe." I knew immediately that she had died.

I didn't want to accept the fact that she was dead, so I went inside and held a mirror to her mouth, but nothing came out of her mouth.

He said, "I can't do that, I can't let anyone know about this." He says, "You have to help me." I agree. Agree.

"I mean, I've been keeping a secret for years and years, so it just seemed second-hand to me just to keep it a secret.

So we went to the mall and told the police that she was gone, missing.

We told security that she was missing, but she was not missing.

And we told the security what we had her wear, and we went home and dressed her in exactly the same thing that the security had dressed her.

"And we took the baby and another child and drove out to places like Interstate 95.

I was so petrified and numb that I could only look in the rearview mirror.

And he laid her on the shoulder of the highway.

My child, I allowed it to happen. ”

This is a survey of negative imagination.

(Applause.) When I started this project, On the Road: Finding American Figures, with a tape recorder, I was traveling all over America trying to find it in all its facets: cattlemen, cowboys, pig farmers, drum majorlets.

So I went to both - two race riots, one of which was the Los Angeles riots. And this next piece is from there.

Because I can say that this is what I learned most about race relations from this work.

You could say it's a kind of aria, but it's on a lot of the tapes I have.

We all know that the Los Angeles riots were caused by four police officers beating a black man named Rodney King.

It was recorded on videotape (technology) and played around the world.

Everyone thought the four cops would go to jail.

They didn't, so a riot broke out.

And what many forget is that there was a second trial ordered by George Bush Sr.

And the trial came back with two officers going to jail and two officers being acquitted. I was present at that trial.

So people were dancing in the streets for fear of another riot.

I was overjoyed that this verdict was back.

Other communities didn't, namely Korean-Americans whose stores burned down.

So I think this woman, Mrs. Han Young-soon, taught me most of what I learned about race.

And she also questions the question Studs asks, this notion of "official truth," "official truth."

So what she's wondering here is that she's taking a chance and wondering what justice is in society.

And this is called "swallowing the bitter".

"I believed America was the best.

I watched a lot of Hollywood luxury lifestyle movies in Korea.

I have never seen a poor man or a black man.

Until 1992, I believed America was the best. I still think so. I'm a victim, so I won't deny it.

However, at the end of 1992, when we were in such turmoil, with economic and mental problems, I began to realize that Koreans were completely left out of society and that we were nothing.

why? Why should we be left behind?

We didn't qualify for treatment, food stamps, GR, welfare, nothing. Many African Americans who never work have the bare minimum of money to live on.

We got a car and a house so we got nothing.

And we are high taxpayers. where is the justice?

"Okay, okay? Okay, okay.

Many African Americans probably think they won the trial.

The morning after the sentencing, as I sat here watching them, they were partying all day, celebrating all over South Central, in every church. And they say, "Justice has finally been done to this society." What about victims' rights?

They earned their rights by destroying innocent Korean merchants.

Like me, they have great respect for Dr. Martin King.

He is the only model for the black community. I don't care about Jesse Jackson.

He is an example of non-violence, non-violence and wants everyone to empathize with his spirit.

"But what about 1992? They destroyed innocent people.

And I wonder if it's really justice for them to get their rights that way.

I sat here alone, watching them, with bitterness in my heart.

It became very interesting, but I was happy with it.

I was happy for them. At least they got something back, OK.

Forget the Korean victims and other victims destroyed by them.

They have been fighting for their rights for more than two centuries, and perhaps we, the mainstream, will suffer even more as they sacrifice other minorities, such as Hispanics and Asians.

That's why I understand. That's why I have mixed feelings about this ruling.

"But I want it, I want it, I wish I could be a part of that fun too.

I wish I could live with black people.

But after the riots, it's just too different.

Fire is still there. What do you say? [indistinct].

Ignite, ignite, ignite. Fire ignites.

it's still there. It can explode at any time. ”

Han Young Soon.

(Applause.) Another reason I don't wear shoes is when I really feel like I have to snuggle up to someone, get under someone's feet, and actually walk in someone else's shoes.

I didn't tell you the year, but in '79 I got sidetracked on race relations by trying to hunt down bull riders and pig farmers and stuff like that.

Two years ago, I finally found a bull rider.

I went to the rodeo with him and our bond deepened.

And he's the subject of an op-ed I wrote about the Republican convention.

He's a Republican -- I won't say anything about my party affiliation, but anyway -- so this is my dear Brent Williams. This is about toughness in case anyone needs to know about being tough for your job. I think there is a real lesson in this.

And this is called "toughness".

"Well, I'm an optimist, so basically I'm an optimist.

So it's like my wife Jolene, her family always saying, 'Did you ever think he was a born loser?

It seems that he is very unlucky.

But when that bull stepped on my kidney, I hadn't lost it--I could have lost a kidney, but I kept my kidney, so I don't think I was born a loser.

I consider myself lucky.

(Laughter) "And I mean, funny things like this happen.

The last time I had a CAT scan was in the doctor's office, with the October 2002 Reader's Digest.

Something like 7 ways to get lucky. It also says that if you want to be lucky, you have to surround yourself with positive people.

So when I told my wife that you wanted to come out and talk to me, she was like, "She's just talking." She's just being nice to you. She doesn't mean to. "And you called me and said you wanted to come out and interview me, and she went to look you up on the Internet.

She said, "Look who she is."

You won't even be able to answer her question. ’ (Laughter.) And she said you were going to make fun of me because I never went to college and I never talked about anything professional.

I said, "Look, that woman talked to me for four hours."

If I hadn't spoken, she would have wanted me to, but I don't think she would even come out here. “Confidence? Well, I think I run more out of determination than confidence.

So confidence is like you've ridden that bull before. you know you can ride him

So confidence is kind of cocky in a way, but in a good way.

But determination is like, you know, 'fuck the form, get your horns up'. (laughs) I'm Tough Hedeman from the movie 8 Seconds. I mean, Pat O'Mealy always said when I was a boy, "You scored more tries than any kid I've ever seen." And hard work and determination are the same thing.

Determination means sticking to that bull, even if it's riding upside down.

Determination is like riding until your head hits the back of the dirt.

"Freedom? That would be a rodeo.

"Beauty? I don't think I know what beauty is.

Well, I think it has to be a rodeo too.

I mean, look at us, the rowdy family walking around, shaking hands, wrestling around me.

It's like saving up a credit card for admission and gas.

We ride together, eat together, sleep together.

I mean, I can't even imagine what my last day at the rodeo would be like. I mean, okay.

I mean, I have a ranch and all that stuff, but I really don't even want to think that day will ever come.

I mean, it's probably like the day my brother died.

"Is it hard? Well, we were in West Jordan, Utah, and this bull stuck my face in a metal bud and my face was completely flipped and I had to go to the hospital.

And they had to stitch me up and straighten my nose.

I had to ride the rodeo that night and didn't want to go under anesthesia or anything like that. So they sewed my face up.

Then they had to straighten my nose and it felt like they took a stick and pushed it into my nose and it went through my brain and out the top of my head. Everyone said this should kill me, but it didn't. I am strong in pain.

(Laughter.) But the good thing is they pushed the rod up there and straightened their noses and they were able to breathe, which they hadn't been able to do since breaking their noses at the high school rodeo. ”

thank you.

(applause)

Ethic and Hedge are located on the ground floor of a giant tower.

An energetic barrier separates them from the second goal of their quest, the Node of Creation.

To reach it, Ethic must use three energy streams to climb the tower.

As soon as she steps forward, the timer starts counting down from 60 seconds.

At the back of the room is a basin made up of invisible towers that can hold energy between them.

After a minute, a torrent of energy rains down from above, filling one unit at a time and preventing the force field from spilling forward or backward.

In 60 seconds of calm, Ethic and Hedge must determine exactly how many units of energy will drop.

For each of the three challenges, we need to choose an amount that exactly fills the basin.

That energy will then propel further upwards.

However, if the amount is even slightly wrong, the energy lift will fail and you will fall.

The drawing on the wall shows some examples.

This configuration captures exactly 2 units of energy.

This configuration captures 4 (3 here, 1 here).

And this also captures 4 because the energy on the right side spills out.

Energy pours down in such a way that it overflows only when there is no space to hold it.

Hedges can display towers of blocks one at a time and count their heights, but cannot see the entire structure at once.

How does the Ethics Program hedge to know exactly how much energy each basin can hold?

Stop now and figure it out for yourself.

One way of thinking about what's going on is: Each empty cell will hold energy only if it ends up with a wall on the left and ends up with a wall on the right.

But it takes a long time for hedge to check this for each individual cell.

But what if we consider an entire column of blocks at once?

For example, how many units of energy can this hold?

Stop now and figure it out for yourself.

Let's analyze the problem by looking at an example.

There are 5 columns of blocks here.

The leftmost one cannot hold energy. Because there is nothing higher than that.

The second stack is trapped between these two 4 block stacks, so it can have 3 units on it.

Subtracting the stack height from the energy leveling height (4) gives us 3 units. So 4 minus 1.

Similarly for the third stack. There are 4 left, 4 right, and 3 high, so 4 minus 3 equals 1 unit.

The 4th and 5th stacks cannot hold energy because there is nothing higher to their right.

We can adapt this idea to our algorithm.

Considering one column at a time as a reference point, for each stack the hedge looks at the left stack to find the height of the tallest, looks at the right to find the height of the tallest, and takes the smaller of the two as the height at which the energy is filled.

If the result is taller than the column in question, subtract the height of the original column and the result is the number of units that column can hold.

If it is at or below the level of the pillar in question, the energy spills out.

Hedge can apply this to the entire basin using a loop that starts with the leftmost column and moves to the right one column at a time.

Do the same for each column. Look tallest to the left, same thing to the right, take the lower of the two heights, subtract the original column height, and if that number is positive, increase the grand total.

His loop iterates for the number of columns.

It works fine, but it takes a long time for big basins.

The hedge repeats the action of turning to the left and turning to the right with each step.

If you have N stacks, look through all N stacks N times.

Is there a faster way?

There is one time saver here. Before doing anything else, the hedge can start on the left side and keep track of what the highest stack is to date.

Here, the first was higher, so again 2, 2, then 4, 4, 4.

Then you can do the same from right to left to find the rightmost stacks: 1, 3, 4, 4, 4.

Eventually he will have a table like this in his memory.

Now the Hedge can make one more pass and use the same equations as before to calculate how much energy is on top of each stack. That is, take the smaller of the left and right stored values ​​and subtract the current tower height.

Instead of looking up N stacks N times, you'll only look up N stacks 3 times. This is what we call linear time.

There are ways to optimize the solution further, but this is good enough for our hero.

Ethics and hedging work as one.

The first cascade goes like a breeze and they climb the tower.

The second is a little more difficult.

The third is huge, with dozens of blocks stacked on top of each other.

The timer decrements towards zero, but Ethic's program is fast.

She puts the handles in place at just the right moment, and the energy lifts them to the node of creation.

Like the first, it reveals a vision, a memory of years gone by.

Machines in the world have changed everything, and in his position as chief robotics engineer, Ethick was troubled by what he saw.

When the Blood Barrier rose to trap people, she realized something was seriously wrong.

So she created three artifacts with the ability to restore people's powers, creativity, and memories, and smuggled them into three communities.

Before she could teach people how to use it, the government discovered her work and sent bots to arrest her and other programmers.

The last thing Ethic created with the World Machine was a robot that protected the ancient device from the forces of ignorance by enclosing it in a giant maze.

She named her work "Hedge".

Without any warning, the energy lift flashes and then disappears.

[As of the morning of February 27, 2020, there have been at least 82,000 confirmed coronavirus cases worldwide and 2,810 deaths from the virus.

TED invited Dr. David Heyman to share his latest findings on the epidemic. ] [What happens when you get coronavirus?] For most people, this looks like a very mild illness, like the common cold.

Some people become infected and become seriously ill. Among them are medical workers.

They receive higher doses than normal people, and at the same time they have no immunity, making them very susceptible to infections.

Therefore, in the general population, the amount of virus you receive when you get infected is likely to be much less than the amount that health care workers would receive, and they have more severe infections.

Then your infection will be less serious.

So it's the elderly and those with co-morbidities that we really need to care for in hospitals.

[Who should be most concerned about this?] Well, first and foremost it is people who live in developing countries who may not have access to adequate medical care in the event of an epidemic in their country, and may not have access to a hospital at all.

Such people, especially the elderly, will be at greater risk.

Elderly people of all populations are at risk, but especially those who cannot obtain oxygen.

In developed countries, those at risk are the very old with comorbidities, diabetes and other diseases.

The general population does not appear to be in great danger.

[What pre-existing medical conditions put people at risk?] First and foremost, lung disease present as a comorbidity is also important.

In general, older people, especially those over the age of 70, are at greater risk because their immune systems are not as effective as they used to be and they are more susceptible to infections.

In addition, there have been cases of co-infection with influenza and bacterial co-infection with pneumonia in China.

[Where can I get the latest information?] The Centers for Disease Control of Atlanta tracks information on its website and provides regular updates.

The World Health Organization in Geneva, which coordinates many international activities, also operates a website with daily updates.

It is our responsibility as individuals to obtain that information, so we can make sure that we understand it and that we can uniquely contribute to the prevention of a large-scale epidemic.

[You led the global response to the 2003 SARS outbreak.

How does it compare to this outbreak?] It's the same problem with all new infections.

This is an infection that occurs even in people who have never been exposed to this virus before.

They have no antibody defense, and it is unknown if their immune system can handle the virus.

This is a virus that normally infects bats and other animals, but suddenly it also infects humans.

And mankind has no experience with this virus.

But just like with SARS, we are slowly learning a lot.

And as you know, the death toll is certainly higher than SARS.

But if you divide that by the denominator of people infected, you'll end up with far more people infected than with SARS.

The fatality rate, or the ratio of deaths to SARS cases, was about 10 percent.

With the current coronavirus, that percentage is 2%, maybe less.

Therefore, the virus is much less virulent, but it is still a virus that causes mortality and one that we do not want to invade the human population.

[Have you responded appropriately at airports and other border crossings?] Clearly, airports and land borders cannot prevent disease from entering.

People in incubation can cross borders and infect others when they get sick.

Therefore, borders are not a way to prevent internal transmission by checking temperatures.

Borders are important because they enable people arriving from at-risk areas to have a printed or verbal understanding of what the signs and symptoms of the disease look like and what to do if they think they may be infected.

[What is the timeline for the vaccine?] A vaccine is currently in development and a lot of research is going on.

That research will first need to develop a vaccine, then study its safety and efficacy in animals infected with the virus after vaccination, and then move on to human studies.

Animal testing has not yet begun, but will begin soon for certain vaccines.

And it is believed that by the end of the year or early next year, there may be several vaccine candidates ready to be studied for regulatory approval.

This means that it will be at least a year before a vaccine that can be used by many people is developed.

[What are the still unanswered questions about the outbreak?] We know how it is contagious, but we don't know how easily it spreads in humans, in communities, or in unenclosed areas.

For example, infections have been found to spread very easily in enclosed areas on cruise ships.

We need a better understanding of how the virus spreads when it enters more open places where people are exposed to potentially ill people.

[What could be improved about the global response?] The big problem in the world today is that we see epidemics in developing countries as something we should stop.

So when the Ebola outbreak hits, we ask, 'How can we stop this outbreak in our country?'

We don't think, "How can we strengthen the country's capacity to detect and respond to infectious diseases?"

Therefore, we have not invested enough in helping countries develop core public health competencies.

The work we have done has been invested in many mechanisms around the world that can help other countries stop the spread of the disease.

But we want to see a world where every country can do its best to contain the spread of the disease in its own country.

[Will we see more outbreaks of emerging infectious diseases in the future?] Currently, the population exceeds 7 billion.

And when those people are born into this world, they demand more food, they demand a range of things, they live closer.

In fact, we are an urban society and people live in urban areas.

And at the same time, we are raising more animals, and those animals also provide food for humans.

So what we're seeing is that the boundaries between animals and humans are getting tighter and tighter.

And this intensive farming of animals and this intensive increase in the human population living together on the same planet is a crucible in which outbreaks can and do indeed occur.

Ultimately, there will be more outbreaks of these infections.

So today's emerging infectious diseases are only warnings of what might happen in the future.

We need to ensure technical cooperation around the world to work together so that we can quickly provide the information we need to understand and control these epidemics as they occur.

[What's Worst Awaiting?] It's impossible to predict exactly.

So all I can say is that we all have to prepare for the worst case scenario.

And at the same time, let's learn how to protect ourselves and protect others if we are caught in the epidemic.

[For more information, see the World Health Organization Centers for Disease Control and Prevention]

I am a pediatric cancer physician and stem cell researcher at Stanford University. The clinical focus there is bone marrow transplantation.

Well, inspired by Jill Bolte Taylor last year, I didn't bring a human brain, but a liter of bone marrow.

And in fact, bone marrow is used to save the lives of tens of thousands of patients, most of whom suffer from advanced malignancies such as leukemia, lymphoma, and other diseases.

So, a few years ago, I did a transplant fellowship at Stanford University.

I am in the operating room. Here we have Bob, a volunteer donor.

We send his bone marrow across the country to save the life of a child with leukemia.

So how do we actually harvest this bone marrow?

Well, we have an entire operating room. A team, general anesthesia, a nurse, and another doctor across from me.

Bob is on the table and we use this kind of small needle, you know, not too big.

The way we do this is basically like putting this through soft tissue and hammering it into a hard bone, which is the technical term, and aspirating about 10ml of bone marrow each time with a syringe.

and give it to the nurse. She pours it into a can.

give it back to me And we do it over and over.

About 200 times.

And by the time this was over, my arms were sore and my hands had calluses, much less Bob's butt like this one, like Swiss cheese.

So I suspect this procedure hasn't changed in about 40 years.

And there are probably better ways to do this.

So I came up with a minimally invasive approach and a new device called the Marrow Miner.

This is it.

And here's how Marrow Miner works.

Our standard see-through patient.

Instead of going into the bone dozens of times, just go into the front or back of your hips once.

There is also a flexible, powered catheter with a special wire loop tip that stays inside the crunchy part of the bone marrow and follows the contours of the hip joint as it moves around.

So you can aspirate or aspirate abundant bone marrow very quickly through a single hole.

You can run multiple passes through the same entry.

No robot needed.

And very quickly, Bob is able to perform this harvest as an outpatient with just one puncture and local anesthesia.

So I made some prototypes. I received a small grant at Stanford University.

So, I played around with this a bit.

And our team members developed this technology.

And I ended up getting two big animals and a pig study.

And to their surprise, they found that not only did the Marrow Miner extract bone marrow, but it also increased stem cell activity in the bone marrow by a factor of 10 compared to conventional devices.

The device was approved by the FDA only last year.

I have a living patient here. You can see that it draws a smooth curve.

Here there are two paths from the same hole on the same patient.

This was done on an outpatient basis under local anesthesia.

And they also yielded about 3 to 6 times more stem cells than standard approaches performed on the same patients.

So why should we care? Bone marrow is a very rich source of adult stem cells.

Everyone knows about ES cells, right?

They have great potential, but have yet to enter clinical trials.

Adult stem cells are present throughout our body, including hematopoietic stem cells in our bone marrow, and we have used them as a form of stem cell therapy for over 40 years.

The past decade has seen an explosion in the use of bone marrow stem cells to treat other ailments in patients such as cardiology, vascular disease, orthopedics, tissue engineering, and neurology to treat Parkinson's disease and diabetes.

We are announcing and commercializing the 2.0 generation of Marrow Miner this year.

It is hoped that this will allow more stem cells to be retrieved, leading to better results.

This may encourage more people to sign up as potential life-saving bone marrow donors.

You may be able to store your own bone marrow stem cells when you are young and healthy so that you can use them in the future if you need them.

And finally, here is a picture of a bone marrow transplant survivor. They gather at Stanford every year for their alumni reunion.

Hopefully this technology will give us more survivors in the future.

thank you.

(applause)

I'm a neuroscientist and professor at the University of California.

Over the past 35 years, I have studied behavior based on everything from genes to neurotransmitters to dopamine to circuit analysis.

That's what I usually do.

But for some reason, just recently, I got into something else.

And it all started when one of my colleagues asked me to analyze the brain of a psychopath killer.

This is a typical lecture I give.

And the question is, "How do we get to the psychopath killer?"

It's these people, these types of people, that I call psychopath killers.

So the parts of the brain I studied are people you know.

I don't know what I'm looking at when I get my brain.

It's a blind experiment. They gave me normal people and everything.

So, I checked about 70 cases.

And what came out was a lot of data.

So we rationalize this sort of thing based on genetics, brain damage, interactions with the environment, and how machines work.

Therefore, we are interested in the exact location of the brain and what are the most important parts of the brain.

We have been studying gene interactions, so-called epigenetic effects, brain damage, the environment, and how they are connected.

And how you fall into a psychopath or murderer depends on when the damage happens.

It's really a very precise timing thing.

There are different types of psychopaths.

So, we will proceed along this line. Introduce patterns.

The pattern was that all the people I saw were murderers, serial killers, and had damage to the orbital cortex just above the eyes, the eye sockets, and the medial part of the temporal lobe.

So there was a certain pattern for each, but they were all a little different.

They had other types of brain injuries.

Importantly, the major violence gene is called the MAO-A gene.

And there are variants of this gene in the normal population.

Some of you have this. And it has to do with gender.

It's on the X chromosome. And in this way you can only get from your mother.

And indeed, perhaps this is why most men, boys, are either psychopathic killers or are highly aggressive.

It's kind of diluted because the daughter can get 1 X from her father and 1 X from her mother.

However, a son can only get the X chromosome from his mother.

This is how it is passed down from mother to child.

And this is interesting because it has to do with an excess of serotonin in the developing brain, which is supposed to calm and relax.

However, carrying this gene exposes the brain to this gene in the womb, which desensitizes the entire brain to serotonin and prevents it from functioning later in life.

And I just gave this talk in Israel this past year.

And it has some consequences.

Theoretically, this means that for this gene to be expressed in a violent way, one must be involved in a truly traumatic event very early in pre-adolescence – not least by being stressed or slapped, but actually seeing violence in 3D or being involved in it.

right? That's how the mirror neuron system works.

So if you have that gene and you see a lot of violence in certain situations, this is a recipe for disaster, absolute disaster.

And I think in those parts of the world where violence is constant, generations of children will be born to witness all this violence.

And if I'm a young girl somewhere in a violent area, say 14, and I want to find a marriage partner, I'll find a tough guy to protect me.

Now, what's wrong is that these genes tend to cluster together.

And now boys and girls understand it.

So, generations later, here's the idea, I think we really do have a tinder box.

That was the idea.

But then my mother said to me, "I heard you were talking about a psychopath killer.

And you speak as if you come from a normal family. ”

I said, "What the hell are you talking about?"

She then talked about our own family tree.

Of course she said this was my dad's fault.

She had no violent background, but my father was.

Well, she said, "I have good news and I have bad news.

One of your cousins ​​is Ezra Cornell, the founder of Cornell University.

But the bad news is that your cousin is also Lizzie Borden.

Well, I said, "Okay, so what? There's Lizzie."

She said, "No, it will be worse, read this book."

And this is this Killed Strangely, this historical book.

And the first mother murdered by a son was my great-grandfather.

Well, this is the first murder case.

And the book is very interesting. Because it's about witch trials and how people thought back then.

But that's not all.

There were seven other men on my father's side, including the Cornells, all of whom were murderers.

Now, let's take a short break here.

(Laughter) Because during World War II my father himself and my three uncles were all conscientious objectors and they were all cats.

But sometimes, like Lizzie Borden, three times in 100 years, we owe it.

(Laughter) The moral of the story is that people in glass houses shouldn't throw stones.

But here's what's more likely.

(Laughter.) And we had to act. Now our children know that.

And they all seemed fine.

But our grandchildren will be a little worried here.

So what we did was start doing PET scans of the whole family.

(Laughter) We started doing PET scans, EEGs, genetic analysis to see where the bad news is.

It turns out that one son and one daughter, brothers do not get along and their patterns are exactly the same.

They have the same brain, they have the same brain waves.

And now they are as close as possible.

But somewhere along the way, bad news will arrive.

And I don't know where it shows up.

That's my story.

(laughter)

Interestingly, Charles Darwin was born into a world of medium to dark pigment as a very pale man.

Darwin enjoyed great privileges throughout his life.

He lived in a fairly wealthy house.

He was raised by very supportive and concerned parents.

And in his twenties, he embarked on a wonderful voyage aboard the Beagle.

And in the course of that voyage, he saw amazing things: an amazing diversity of plants, animals, and people.

And the observations he made on that epic journey were eventually condensed into his wonderful book, The Origin of Species, published 150 years ago.

Now, what is so interesting, and to some extent notorious, about On the Origin of Species is that there is only one line in it about human evolution.

“It will shed light on the origins of mankind and its history.”

It wasn't until much later that Darwin actually spoke and wrote about humans.

After many years of traveling on the Beagle and listening to explorers and naturalists, he knew that skin color was one of the most important factors in the diversity of people.

And he had a bit of an interest in skin color patterns.

He knew that people with darker pigments were found near the equator. Pale-pigmented people like him were found near the poles.

So what did he judge from all this?

Well, he didn't write anything about it in On the Origin of Species.

But much later, in 1871, he had something to say about it.

And it was very interesting. He said, "Of all the differences between human races, skin color is the most prominent and one of the most prominent."

And he went on to say, "These differences are not consistent with the corresponding climate differences."

So he traveled here and there.

He has seen people with different skin colors live in different places.

Still, he rejected the idea that human skin pigmentation is climate-related.

If Darwin was still alive

I wish Darwin had NASA.

Now, one of the great things NASA is doing is putting up different satellites that detect all sorts of interesting things about our environment.

And for decades there has been a series of TOMS satellites collecting data on radiation on the Earth's surface.

The TOMS 7 satellite data shown here show the annual mean ultraviolet radiation at the surface.

Well, the really hot pink and red areas are the areas with the highest UV doses of the year.

The progressively cooler colors of blue, green, yellow, and finally gray indicate areas with much lower UV exposure.

An important part of the human skin pigmentation story is how much of the northern hemisphere lies in these cool gray zones.

This has tremendous implications for our understanding of the evolution of human skin pigmentation.

And what Darwin didn't understand, or perhaps didn't want to understand at the time, is that there is a fundamental relationship between UV intensity and skin pigmentation.

And that skin pigmentation itself was a product of evolution.

And as we know it today, when we look at the map of skin color and the predicted skin color, we see a beautiful gradation from the darkest skin pigmentation towards the equator and from the lightest skin pigmentation towards the poles.

What is very important here is that the first humans evolved in a high UV environment in sub-equatorial Africa.

The first member of our lineage, the genus Homo, had dark pigments.

And we all share the amazing heritage of originally having dark pigments 2-1.5 million years ago.

Well, what happened to our history?

First, let's look at the relationship between ultraviolet rays and the earth's surface.

Early in our evolution, looking at the equator, we were exposed to high levels of UV radiation.

The most energetic type of UVC was blocked by the Earth's atmosphere.

But especially UVB and UVA came in unhindered.

UVB turned out to be very important.

Although it is highly destructive, it also catalyzes the production of vitamin D in the skin. Vitamin D is a molecule that is critically necessary for our strong bones, immune system health, and myriad other vital functions in our bodies.

Living at the equator, we get a lot of UV light, and melanin (this wonderfully complex ancient polymer compound in our skin) has acted as an excellent natural sunscreen.

This polymer is surprising because it exists in so many different organisms.

Various forms of melanin have been around on Earth for probably a billion years and have, as is often the case, been replenished over and over again through evolution.

Why change if it works?

Therefore, melanin was adopted as a natural sunscreen in our lineage, especially in our first ancestors who evolved in Africa.

It protects the body from UV degradation, DNA breakage and damage, and breakdown of a very important molecule called folic acid that helps the body create and regenerate cells.

It is wonderful. We have evolved this super protective and amazing melanin cover.

But then we moved.

And mankind was scattered not once, but twice.

Great migrations are taking place outside of our equatorial homelands, from Africa to other parts of the Old World, and most recently to the New World.

What did humans face when they dispersed across these latitudes?

The conditions were pretty cold, but not too strong in terms of UV conditions.

So if we're anywhere in the northern hemisphere, look what's happening to the ultraviolet.

We are still getting our dose of UVA.

However, all or nearly all of the UVB is dissipated through the thickness of the atmosphere.

If you are skiing in the Alps in winter, you may experience UV rays.

But this is all UVA, and importantly UVA is incapable of producing vitamin D in the skin.

Thus, people living in northern hemisphere environments have lost the ability to produce vitamin D in their skin for most of the year.

This has had a tremendous impact on the evolution of human skin pigmentation.

What happened was that the lineages of these people dispersed across the northern hemisphere lost their pigmentation to ensure their health and well-being.

There was natural selection in the evolution of lightly pigmented skin.

Here we begin to see the evolution of the beautiful sepia rainbow that has now become the hallmark of all humankind.

Light-pigmented skin evolved not once, not twice, but perhaps three times.

This applies not only to modern humans, but also to one of our distant unrelated ancestors, the Neanderthals.

It's amazing and amazing evidence of the power of evolution.

Humans have been on the move for a long time.

And in the last 5,000 years alone, its speed has increased and so has its distance.

Here are just a few of the greatest human movements, voluntary movements, of the last 5,000 years.

Let's take a look at some of the major latitude violations. People in areas with high UV go to areas with low UV and vice versa.

And not all of these movements were spontaneous.

Between 1520 and 1867, the transatlantic slave trade displaced 12,000,000 people from areas of high UV to areas of low UV.

Now, this has had all sorts of nasty social consequences.

However, it had a negative impact on people's health.

so what? we have been moving.

We are so smart that we can overcome all these seemingly biological obstacles.

We are often unaware of the fact that our skin lives in an environment that is inherently less adaptive.

Some people with light skin live in areas with strong UV rays.

Some people with darker skin live in areas with less UV light.

These have a huge impact on our health.

If you're light-pigmented, you should be aware of skin cancer issues and the destruction of folic acid in your body by too much sunlight.

Epidemiologists and doctors have been very kind about protecting our skin.

Where they are less successful in teaching their people is the problem of darker people who live in high latitudes or who work indoors all the time.

Because the problem there is just as serious, but even scarier. This is because vitamin D deficiency due to lack of UVB radiation is a big problem.

Vitamin D deficiency is creeping up on people, causing all sorts of health problems with their bones, a gradual weakening of their immune system and loss of immune function, and possibly some problems with their mood, health and mental health.

So we have one of the great evolutionary products in skin pigmentation that still affects us today.

And, as we know, its social impact is incredibly severe.

We live in a world where light-skinned and dark-skinned people live next to each other, often coming closer as a result of social interactions that are very uncomfortable at first.

So how do we overcome this?

How can we make sense of it?

Evolution helps us.

200 years after Darwin's birthday, America's first moderately pigmented president was born.

(Applause.) How wonderful!

(Applause.) This guy is important for many reasons.

But we have to consider how he compares to other people on the planet in terms of his pigmentation.

As one of many urban mixed populations, he very much epitomizes mixed pedigree, mixed pigmentation.

And he looks a lot like people with medium pigmentation who live in southern Africa and Southeast Asia.

These people are much more likely to tan and develop more pigment in their skin as a result of sun exposure.

You're also at risk of vitamin D deficiency if you have a desk job like that guy.

Let's all wish him good health and awareness of his own skin pigmentation.

Now, the great thing about the evolution of human skin pigmentation, and the phenomenon of pigmentation, is that it is a demonstration and evidence of evolution by natural selection.

When people ask, "What is the evidence for evolution?"

No need to think about rare examples or fossils.

Just look at your skin.

I think Darwin would have appreciated this, even if in his own lifetime he avoided the importance of climate in the development of pigmentation.

If he could see the evidence we have today, I think he would have understood it.

he will appreciate it.

And best of all, he taught me that.

You can teach it.

You can touch it.

It is understandable.

Please let me out of this room.

Take care of your skin color and celebrate it.

spread the word.

You have etched into your skin an evolutionary piece of our species' history.

Understand it. appreciate. Let's celebrate.

Go out. Isn't it beautiful? Sounds great, doesn't it?

You are a product of evolution.

thank you.

(applause)

Can I say how happy I am to be away from the tranquility of Westminster and Whitehall? (laughter) This is Kim. A 9-year-old Vietnamese girl whose back was destroyed by a napalm bomb. She awakened the conscience of America and began to end the Vietnam War.

This is Birhan, the Ethiopian girl who started Live Aid in the 1980s. She was rescued 15 minutes before dying. Photos of her rescue have gone viral around the world.

This is Tiananmen Square.

The man before he got into the tank became a photograph that became a symbol of resistance throughout the world.

Next is a photo of a girl from Sudan, just before her death, with a vulture floating in the background. The photo went viral and inspired people to take action against poverty.

This is Neda, an Iranian girl who was shot during a demonstration in Iran just a few weeks ago with her father. She's rightfully in the spotlight of the YouTube generation now.

What do all these photos and events have in common?

What they have in common is that what we see unlocks what we cannot see.

What we see unlocks the invisible bonds and bonds of empathy that bind us to human communities.

What these pictures show is that we feel the pain of others, no matter how far away we are.

I think what these pictures show is that we believe in something bigger than ourselves.

What these pictures show is that morality exists in all religions, all faiths, and all continents. Not only do we share the pain of others and believe in something greater than ourselves, but we also have a duty to act when we see something wrong to be right, an injury to be right, a problem to be fixed.

There is a story that Swedish Prime Minister Olof Palme went to see American Ronald Reagan in the 1980s.

Before his arrival, Ronald Reagan, then the prime minister of the Social Democratic Party of Sweden, said, "Isn't this man a communist?"

The answer was, "No, Mr. President, he is anti-communist."

And Ronald Reagan said, "I don't care what kind of communist he is!"

(Laughter.) Ronald Reagan asked Swedish Social Democratic Prime Minister Olof Palme, "So what do you believe? Do you want to abolish the rich?"

He said, "No, I want to abolish the poor."

Our responsibility is to give everyone the opportunity to reach their full potential.

I believe there are morals and global ethics that attract the attention of all religions, people of all faiths and non-believers.

But I think what's new is the ability to instantly communicate across borders all over the world.

We now have the ability to find common ground with people we will never meet but will meet through the internet and all modern means of communication. That we now have the capacity to organize and take collective action to address the issues and injustices we want to address. I believe that this is a unique time in human history and the beginning of what I call the creation of a truly global society.

Go back 200 years when the slave trade was under pressure from William Wilberforce and all the protesters.

They staged protests across the UK.

They won public opinion for a long time.

However, it took 24 years for the campaign to succeed.

If you could win people's hearts using modern means of communication, what could they have done with this photo?

Or take Eglantin Jebb, the woman who founded Save the Children 90 years ago.

She was so appalled by what was happening in Austria as a result of the First World War and what was happening to the children of Austria's defeated families, that she wanted to take action in England, but had to go from house to house and leaflet to leaflet to get people to join the rally at the Royal Albert Hall. That meeting ultimately gave birth to the international organization Save the Children, now fully recognized as one of the great organizations in our country and the world.

But what more could she have done if she could use modern means of communication to create a sense that any injustice she witnessed had to be dealt with immediately?

So let's see what happened in the last decade.

In the Philippines in 2001, President Estrada had a million people texting each other about the regime's corruption, which ultimately led to its collapse. Of course, it was called a "coup". (Laughter.) And Zimbabwe had its first elections a year ago under Robert Mugabe.

It was impossible to fix the election in the way that prime minister wanted because people were able to take pictures of what was happening at the polling stations with their mobile phones.

Or consider the example of monks who were blogging with Burma. No one knew anything about the repression that was happening in this country until a blog told the world that repression existed: lives were lost, people were being persecuted, and that they must listen to one of the world's great prisoners of conscience, Aung San Suu Kyi.

Now consider Iran itself and what its people are doing today. Following what happened to Neda, those who are preventing Iranian security officials from finding bloggers from Iran, all the bloggers have changed their addresses to Tehran, Iran, making security officials difficult.

So consider what modern technology can do: the power of moral sense combined with the power of communication and the ability to organize internationally.

In my opinion, it gives us, as a community, the first opportunity to radically change the world.

Foreign policy will never be the same again. It cannot be run by Elite. You have to listen to the opinions of people who write blogs around the world and operate it.

Two hundred years ago, the problem we had to solve was slavery.

I think 150 years ago the main problem in a country like ours was how young people and children had the right to an education.

A hundred years ago there was pressure on the right to vote in most European countries.

Fifty years ago, the pressure was on social security and welfare rights.

In the last 50-60 years we have seen fascism, anti-Semitism, racism, apartheid, discrimination based on sex, gender and sexuality. All of this is under pressure because of the campaigns people have been doing to change the world.

A year ago, I was with Nelson Mandela when he was in London.

I was at a concert he was attending to mark his birthday and create a new resource for the foundation.

I was sitting next to Nelson Mandela when Amy Winehouse took the stage - it was such an honor to do so. (Laughter.) And Nelson Mandela was very surprised by the singer's appearance, and I was explaining to him who she was at the time.

Amy Winehouse: "Nelson Mandela and I have a lot in common.

My husband also spent a long time in prison. ”

(Laughter.) Then Nelson Mandela came down on stage and summed up the challenge for all of us.

He said he had climbed the great mountain in his lifetime, the mountain that challenged and defeated racial oppression and defeated apartheid.

He said there are even bigger challenges ahead, the challenges of poverty and climate change. These are global challenges that require global solutions and require the building of a truly global society.

We are the first generation in a position to do this.

It combines the power of global ethics with the power of our ability to address the challenges we face today, most of which are global in nature, and to communicate and organize globally.

Climate change cannot be solved by one country alone, it needs to be solved by the world working together.

As we have seen, the financial crisis cannot be solved by America alone or by Europe alone. The world had to work together.

Consider security and terrorism issues, and human rights and development issues as well. Africa cannot solve these problems alone. These problems cannot be solved by America or Europe alone.

We cannot solve these problems without working together.

So it seems to me that the great project of our generation is to build, for the first time, a truly global society from a global ethic and a global capacity to communicate and organize together, with institutions built on that ethic, serving that global society, and capable of creating a different future.

We are now and the first generation to have the power to do so.

Consider climate change. Isn't it scandalous that we want to create a global carbon market, but we know that there is a climate change problem, we know we have to give the poorest countries more resources to deal with it, but there is no global body that people can agree on to deal with it?

One of the things that has to be agreed in Copenhagen in the next few months is an agreement to establish a global environmental agency that can deal with the problem of persuading the whole world to move along with the climate change agenda.

(Applause.) One reason institutions alone are not enough is that we need a global ethic of fairness and responsibility across generations, because we have to persuade people around the world to change their behavior.

Consider the financial crisis.

If a crisis that began in New York or in the US subprime market could hit people in poor countries.

If it turns out that people's normal savings are being affected by that subprime product being sent across the country again and again until it reaches banks in Iceland and the rest of the UK, we can't count on the national supervisory system.

In the long run, stability, economic growth, employment and financial stability require a global economic system that ensures shared sustained growth, built on the principle that prosperity in this world is inseparable.

Another challenge for our generation, therefore, is to create a global institution that reflects our thinking about equity and responsibility, not the thinking that underpinned the final stages of recent financial development.

Then let us work on development and build the much-needed partnerships between our country and the rest of the world – the poorest regions of the world.

We do not have the foundation for a proper partnership for the future, but it comes from people's aspirations for a viable global ethic and global society.

I just spoke with the President of Sierra Leone.

The country has a population of 6.5 million people, but only 80 doctors. There are 200 nurses. There are 120 midwives.

With such limited resources, we cannot start building a health system for 6 million people.

Or think of a girl named Miriam whom I met while in Tanzania.

she was 11 years old. Her parents died of AIDS, followed by her mother and then her father.

She was an AIDS orphan who had been handed over and cared for by various extended families.

She herself was suffering from HIV. She had tuberculosis.

I met her in the field, but she was ragged and had no shoes on.

Looking into her eyes, any 11-year-old girl looks forward to the future, but if there was an unreachable sadness in that girl's eyes, and if that moment could be translated to the rest of the world, I believe that all the work done for the Global HIV/AIDS Fund would be rewarded by those who are ready to donate.

And we must build the right relationships between the richest and poorest countries, based on a desire to enable Africa to be self-sufficient in the investments needed in agriculture, so that Africa becomes a food exporter, not a net importer of food.

Consider human rights and security issues in many countries around the world.

Burma is in chains, Zimbabwe is a human tragedy, and thousands in Sudan are dying needlessly in wars we could have prevented.

The Children's Museum of Rwanda has a photograph of a 10-year-old boy, and the Children's Museum commemorates the lives lost in the Rwandan genocide that killed one million people.

I have a picture of a boy named David.

Next to the photo is information about his life.

It said, "David, 10 years old."

David: Ambitions to become a doctor.

Favorite sport: soccer. What did he enjoy most?

make people laugh.

how did he die

Tortured to death.

His last words to his mother, who was also tortured to death, were, "Don't worry. The United Nations is coming."

And we were never.

And the boy believed our promise to help those in need in Rwanda, but we never did.

Therefore, we must create in this world not only peacekeeping and humanitarian aid, but also institutions for the reconstruction and security of some of the world's conflict states.

So my argument today is basically this.

We have the means to build a truly global society.

The institutions of this global society can be built through our efforts.

That global ethic can imbue these institutions with the fairness and responsibility they need to function, but this generation, especially this decade, should not miss the opportunity for President Obama of the United States and people around the world to work with us to create global institutions for the environment, finance, security and development. It is an understanding of our responsibility to others, our desire to bring the world together, and the need to address the problems we all know exist.

In ancient Rome, when Cicero spoke to an audience, people were said to have turned to each other and said of Cicero, "What a wonderful speech."

However, it is said that in ancient Greece, when Demosthenes spoke to an audience, people did not turn to each other and say "great speech."

They said, "Let's march."

We must move towards a global society.

thank you.

(applause)

In a dilapidated hut at the edge of the forest, the couple were in despair.

The woman had just given birth to her 13th child, and her growing family soon ran out of food and money.

The father went into the woods to ponder their problems.

After hours of walking through the trees, he encountered two shadows.

The first person looked like the man's god, the second person looked like the devil.

Both persons offered to ease the man's burden and serve as godfathers to his latest child.

However, the man rejected their offer. I had no intention of entrusting my son to those who would judge human life.

He made his way through the tangled bushes.

Here in the darkest part of the wood, the father loomed a third figure.

A gaunt face with a twisted grin stared down at the sunken eyes.

This is the Shinigami himself, who has come to offer his services as Godfather.

He promised to return when the child was of age and bring him happiness and prosperity.

The father, knowing that all people are equal in the eyes of death, accepted his offer.

Years later, when the child had grown into an ambitious young man, the Skeleton Godfather came for an appointment visit.

In his gnarled hand he held a flask containing remedies for all human ailments.

Death brought this flask for the Godson and promised to make him a successful doctor.

But the powerful drug had very strict rules.

If his godson met a sick man, and death hovered above his bed, the doctor could cure him with just a whiff of antidote smoke.

But if Death remained at the foot of the bed, he would have already claimed the patient as his, and the doctor could do nothing for them.

Before long, the Doctor's powerful medicine and his strange instincts became known throughout the land.

He became rich, famous, and survived the hardships of his youth.

When the king fell ill, he called a famous doctor to treat him.

The doctor burst into the palace ready to demonstrate his skill.

However, when he entered the king's room, he was appalled to see Death sitting at the foot of his bed.

The doctor longed for the glory of saving the king, even if it meant deceiving the godfather.

So he quickly rotated the bed to reverse the position of the reaper, allowing the doctor to administer the antidote at will.

Death was raw.

He warns the arrogant Godson that if he ever deceives Death again, he will pay the price with his life.

Death and the Doctor continued their journey.

After a while, the king's messenger came to pick up the doctor again.

The princess was seriously ill, and the king promised great wealth to anyone who could cure her.

The doctor approached the princesses' room with gold in his eyes.

But his desire vanished when he saw the sleeping princess.

He was so touched by her grace that he did not see death at her feet.

He quickly cured the princess, but before she could say a word of thanks, Death dragged the love-sick godson away.

In an instant the palace melted around them.

The doctor found himself in a huge cavern filled with countless quivering candles representing periods of life.

As punishment for his godson's foolish attempt to gain control over mortal destiny, Death shaved his candle down to the wick.

Seeing his own fading light, the doctor felt a familiar glimpse of terror in the patient's eyes.

In desperation, he begged Death to transfer his dying light to a new candle.

His godfather considered the request, but the doctor's betrayal was too great.

He loosened his bony hand and his godson's candle fell to the floor.

Death stood motionless, its incomprehensible face fixed above the sputtering flames—at last, the doctor's corpse was reduced to a puff of smoke.

For me, many of these career crises actually happen on Sunday evenings, just as the sun is starting to set, and the gap between my hopes and reality begins to diverge so painfully that I often end up crying in my pillow.

I'm mentioning all of this because I don't think this is just a personal issue. You may think I'm wrong, but I think we live in a time when our lives are routinely interrupted by career crises and moments where what we thought we knew about life and careers came into contact with some sort of threatening reality.

Perhaps now it's easier than ever to make a good living.

It's probably harder than ever to keep your cool and free from career anxiety.

Hopefully, we'll look at some of the reasons why we feel insecure about our careers.

Why are we crying silently in our pillows falling victim to such career crises?

One of the reasons we suffer is that we are surrounded by snobs.

In some ways, we have bad news, especially for those coming to Oxford from abroad.

I really have a problem with snobbery. Because sometimes people come from outside the UK.

Imagine snobbery being a peculiarly British phenomenon, obsessed with country houses and titles.

The bad news is that it's not true.

Snobbly is a global phenomenon. We are a global organization and this is a global phenomenon.

What is a snob?

A snob is someone who takes a small part of you and uses it to arrive at a complete vision of who you are.

It's a snobbery.

The main snobbery that exists today is the snobbery about work.

Within minutes at a party, you'll encounter the famous and iconic question of the early 21st century: "What are you doing?"

Depending on how you answer that question, people will either be overjoyed to see you, or look at their watch and make excuses.

(Laughter) Now, the opposite of a snob is your mother.

(Laughter) Not necessarily your mother, or really my mother, but the ideal mother, someone who doesn't care what you do.

Unfortunately, most people are not our mothers.

Most people make a strict correlation between how much time and, if you like, love (not romantic love, it could be anything), love in general, and respect, but it is strictly defined by our position in the social hierarchy.

And that's a lot of the reason why we care so much about our careers and actually start caring so much about material things.

We live in a very materialistic age, and it is often said that we are all greedy people.

I don't think we are particularly materialistic.

I think we live in a society that has simply fixed certain emotional rewards for the acquisition of material goods.

What we want is not material. That's the reward we want.

It's a new look at luxury goods.

The next time you see someone driving a Ferrari, don't think 'this guy is greedy'.

Think, "This person is incredibly vulnerable and in need of love."

(Laughter) Feel compassion, not contempt.

There are other reasons -- (Laughter) There are other reasons why it's probably harder now than ever to feel cool.

One of them, paradoxically, is the hope we all have for our careers because it's associated with something pretty awesome.

Never before has there been such a high expectation of what humans can achieve in their lifetime.

Many sources say that anyone can achieve anything.

The caste system was abolished and anyone could be promoted to whatever position they wanted.

And that's a great idea.

It also carries with it a kind of spirit of equality. We are all basically equal.

There is no strictly defined hierarchy.

There is one really big problem with this. It's a matter of envy.

Envy, it's really taboo to mention envy, but if there's one emotion that dominates modern society, it's envy.

And it is associated with the spirit of equality.

I think it's very unusual for anyone here, or watching, to envy the Queen of England.

The reason we don't envy her, even though she's far richer than any of you and has a very big house, is because she's so weird.

(Laughter) She's just too weird.

We can't sympathize with her, she speaks in a funny way, and she comes from a strange place.

So we can't sympathize with her, and when we can't sympathize with someone, we don't envy them.

The closer two people are in age, background, and cognitive process, the greater the risk of envy. By the way, this is why you should never go to your school reunion. Because there is no stronger point of reference than the people you were with at school.

The problem with modern society is that the whole world has become a school.

Everyone wears jeans and they are all the same.

But it's not.

So a spirit of equality combined with deep inequality can create a very stressful situation.

Just as it was unlikely to join the ranks of the French aristocracy in the 17th century, it is probably unlikely that you will be as rich and famous as Bill Gates today.

But the point is, it doesn't feel that way.

Magazines and other media have led us to believe that with energy, a few bright ideas in technology, and a garage, you too could start doing big things.

(Laughter) The impact of this problem is also being felt in bookstores.

I do that sometimes, but if you go to a big bookstore and look at the self-help section, and if you analyze the self-help books that are being published around the world today, there are basically two kinds.

The first type says, "You can do it! You can do it! Anything is possible!"

The other teaches us how to deal with what we politely call “low self-esteem,” or rudely, “I feel so bad about myself.”

There is a real correlation between a society that tells people they can do anything and the existence of low self-esteem.

This is another way that very positive things can cause nasty kickbacks.

There may be another reason why we are more anxious than ever. It's about my career and where I am in today's world.

And that, once again, ties in with great things.

And that great thing is called meritocracy.

All politicians, right and left, agree that meritocracy is a great thing, and we should all try to make our societies really, really meritocracy.

In other words, what is a meritocratic society?

A meritocratic society is one in which if you have the talent, the energy and the skills, nothing will stop you from getting to the top.

Great idea.

The problem is, if you really believe in a society where those who deserve to be at the top can be at the top, then implicitly, and worse, you also believe in a society where those who are entitled to be at the bottom get to the bottom and stay there.

In other words, your position in life will begin to seem worthy and deserved, rather than accidental.

That's why failure looks more devastating.

In medieval England, when one met a very poor man, he was described as the 'unfortunate one', literally the one who had no luck, the unfortunate one.

Now, especially in America, when you meet people at the bottom of society, you can be unkindly described as a "loser."

There is a real difference between the unhappy and the losers, and it shows the evolution of society over 400 years and our beliefs about who is responsible for our lives.

It's no longer the gods, it's us. we are in the driver's seat.

When it works it's a lot of fun, but when it doesn't it's very disappointing.

At worst, it leads to increased suicide rates, according to analysis by sociologists such as Emile Durkheim.

Individualistic developed countries have more suicides than any other part of the world.

Part of the reason is that people take what happens to them very personally. You are responsible for your successes, but you are also responsible for your failures.

Is there any relief from some of these pressures I have outlined?

I think there is.

Embrace meritocracy.

This idea that everyone has a right to reach where they can reach, I think it's a crazy idea, completely crazy.

I support any politician, left or right, with a half-hearted meritocracy. In that sense, I am a powerful person.

But I think it would be insane to believe that a truly meritocratic society could be realized. It's an impossible dream.

The idea of ​​creating a society where literally everyone is graded, good above and evil below, is impossible.

There are too many random factors: accidents, birth accidents, objects falling on people's heads, illnesses.

We can never judge them, we can never judge people as they should be.

I am drawn to St. Augustine's lovely words in The City of God: "It is a sin to judge a man by his status."

In modern English, it means that it's a sin to rely on a business card to figure out who to talk to.

It's not the post that matters.

According to St. Augustine, only God can actually put everyone in the right position. He will do it on Judgment Day, accompanied by angels and trumpets, and the skies will open.

Insane idea if you're a secularist like me.

But still, the idea has great value.

In other words, hold your horse when you come to judge people.

We don't always know what a person's true worth is.

It's the unknown part of them and we shouldn't act like it's known.

There is another source of consolation and consolation for all this.

When we think about failure in life, one of the reasons we fear failure is not simply loss of income or status.

We fear being judged or ridiculed by others.

Today, the largest medium of ridicule is the newspaper.

Open a newspaper any day of the week and it's full of people who have messed up their lives.

They've slept with the wrong people, taken the wrong drugs, passed the wrong bills - whatever it is, they're ridiculed.

In other words, they failed. And they are portrayed as "losers".

Now, is there an alternative to this?

The Western tradition, I think, presents us with one of the brighter options, the tragedy.

Developed in ancient Greek theater in the 5th century BC, tragic art was essentially an art form devoted to tracking how people fail, and also to giving them a level of sympathy that normal life would not necessarily give them.

A few years ago I was thinking about this and went to a tabloid called The Sunday Sport. I do not recommend starting reading if you are not already familiar with it.

(Laughter.) And I went to tell them about the great tragedy of Western art.

I wanted to know how they would get to the heart of the story if it came in as a news item on their news desk on a Saturday afternoon.

I mentioned Othello. They had never heard of it, but were fascinated.

(Laughter) I asked them to write the headline for the article.

They came up with "Love-Crazy Immigrant Kills Senator's Daughter."

Splashed all over the headlines.

I gave them the plot of "Madame Bovary".

Again, they discovered the book and were fascinated.

And they wrote, "Shopaholic adulterer swallows arsenic after credit fraud."

(Laughter.) And my favorite -- they really have their own kind of genius, these guys -- my favorite is Sophocles' Oedipus Rex, "Sex With Mum Was Blinding."

(Laughter) (Applause) In a way, if you like, it's like having tabloids on one end of the sympathy spectrum.

At the opposite ends of the spectrum are tragedy and tragic art.

And I think I'm arguing that we should learn a little bit about what's going on in the world of tragic art.

Calling Hamlet a loser is insane.

Although he lost, he is not a loser.

I think that's the message of the tragedy for us, and why it's so, so important.

Modern society, and the other thing that causes this anxiety, is that at our core there is nothing but human.

We are the first society to live in a world that worships nothing but itself.

We value ourselves so highly that we should. We've put people on the moon and done all sorts of amazing things.

And we tend to worship ourselves. Our heroes are human heroes.

It's a very new situation.

In most other societies, the worship of something transcendental, such as gods, spirits, forces of nature, the universe, has been at the center of it, and something else has been worshiped.

We've kind of lost that habit, but I think that's why we're especially drawn to nature.

It is often described as such, but it is not for our health, but because it is a human escape from the anthill.

It's an escape from our own competition, and our own drama.

That's why we enjoy looking at glaciers and oceans, looking at the Earth from its outer circumference, and so on.

We like to touch things that are not human, and things that are very important to us.

I think what I've been talking about so far is about success and failure.

And one of the interesting things about success is that we think we know what that means.

Certain ideas immediately come to mind when I say that there is a hugely successful person on the other side of the screen.

You would think that the person made a lot of money and achieved fame in some field.

My Theory of Success -- I'm a very interested person in success, I really want to be successful, and I'm always wondering how I can be more successful.

But as I've gotten older, I've also become very nuanced about what the word "success" means.

Here's an insight I got of the success: You cannot succeed in everything.

We hear a lot about work-life balance.

Nonsense.

A vision of success must therefore acknowledge what it is that it is losing and where the elements of loss are.

And I think that if you live wisely, you accept that there are elements that, as I say, do not succeed.

And what can be said about a successful life is that often the idea of ​​what it means to be successful is not our own.

They are sucked in by others. If it's a man, it's the father, if it's a woman, it's the mother.

Psychoanalysis has been appealing to this message for some eighty years.

No one listens intently enough, but I strongly believe it to be true.

And we also breathe in messages from everything from television to advertising to marketing.

These are very powerful forces that define what we want and how we see ourselves.

Many people will want to go into banking when they are told that banking is a very respectable profession.

When banking becomes less respected, we lose interest in banking.

We welcome your suggestions.

So my point is not that you should abandon the idea of ​​success, but that you should make sure it belongs to you.

We need to focus on our ideas and make them our own. That we are the authors of true ambitions.

Because not getting what you want is bad enough, but having an idea of ​​what you want and finding out at the end of the journey that it wasn't really what you wanted all along is even worse.

Well then, I will end there.

But what I really want to stress is: "Go for it."

But let's accept the weirdness of some of our ideas.

Let's delve into our concept of success.

Let's make sure our idea of ​​success is really our own.

thank you very much.

(Applause) Chris Anderson: It was very interesting.

But how do we reconcile this idea that it is bad to think of someone as a “loser” with the idea that many people like to take control of their own lives, and that perhaps a society that encourages it needs winners and losers?

Alain de Botton: Yes, I think what I want to stress is simply that the winning and losing process is random. Because justice in all things matters today, and politicians talk about justice all the time.

Now I believe in justice, but I think it's impossible.

Therefore, we should do all we can to pursue it, but we must always remember that no matter who confronts us, no matter what happens in their life, there is a strong element of hit and miss.

That's what I'm trying to leave room for. Otherwise it can be quite claustrophobic.

CA: So, do you think you can combine a kind and gentle work philosophy like yours with a successful economy?

Or, you can't, but do you think it's not too much of a problem to put too much emphasis on it?

AB: The nightmare idea is that scaring people is the best way to get jobs, and somehow the harsher the environment, the more people will struggle.

Who would you like to be your ideal father?

And the ideal father is a strict but kind person.

And that's a very tough line.

We need a model father figure in society that avoids the extremes of authoritarian discipline on the one hand and slow, ruleless alternatives on the other.

AC: Alain de Botton.

AB: Thank you.

(applause)

Hello! My name is Goran Levin.

I am both an artist and an engineer, and this is an increasingly common form of hybrid.

But I still get into a weird crack where people just don't understand me.

After some searching, I found this wonderful photo.

It was a letter from the Art Forum in 1967, which read, "I can't even imagine doing a special issue on electronics and computers in the field of art." And they haven't yet.

And just so you don't think you're more enlightened as a Desirati, I went to the Apple iPhone app store the other day.

where is the art? Improved productivity. I have been playing sports.

And for some reason, the idea of ​​wanting to make art for the iPhone, which my friends and I are doing now, is not yet reflected in our understanding of what computers are for.

So I think there's a kind of lack of understanding of what it means for artists to use material from their own time, or from their own time, both ways. I think artists have an obligation to do that, but to really explore the expressive possibilities of the new tools that we have.

For myself, I'm an artist and I'm very interested in expanding the vocabulary of human behavior and basically empowering people through interactivity.

I want people to discover themselves as actors and creative actors through interactive experiences.

A lot of my work is trying to escape this situation.

This is a picture of my student's desktop.

And when I say desktop, I don't just mean the actual desk with the mouse scuffing the surface of the desk.

If you look closely, you can even see a hint of the Apple menu here in the upper left. Here the virtual world literally pierces the physical world.

This is, as Joy Mountford once said, "The mouse is perhaps the thinnest straw that can suck up all human expression."

(Laughter) And what I'm really trying to do is give people a richer kind of interactive experience.

How can we move away from the mouse and use the whole body as a way to explore aesthetic experiences, not necessarily utilitarian ones?

So I write software. That's how I do it.

And many of my experiences are like mirrors in some ways.

Because, in a way, this is the first way people discover their own potential as actors, discover their own subjectivity.

By saying, "Who is that person in the mirror? Oh, it's actually me."

For example, this is a project from last year called the Interstitial Fragment Processor.

And it allows people to explore the negative shapes they create when they are just going about their daily business.

So when people make shapes with their hands, heads, etc., or with each other, those shapes literally make sounds and pop out of empty space. Basically, we often take this invisible or undetected space and make it something real so that people can appreciate it and be creative.

Again, people discover their creative agency in this way.

And their own personalities come out in a totally unique way.

So, in addition to the use of whole-body input, what I've been studying for some time is the use of speech, which is a very expressive system for us, vocalization.

Singing is one of the oldest ways we make ourselves heard and understood.

Then I came across a wonderful 1927 study by Wolfgang Köhler, the father of Gestalt psychology. He submitted these two shapes to the same audience as you.

And one of them, he said, is called Maluma.

And one of them is called Takeda. Which is which?

Anyone want to take a risky guess?

Maluma is on top. yes. So.

As he says here, most people would answer without any hesitation.

What we're really seeing here is a phenomenon called vocal anesthesia, which is a form of synesthesia that you all have.

Dr. Oliver Sacks says that perhaps 1 in a million people have true synesthesia to hear colors and taste shapes, but vocal sensations are something we all experience to some degree.

It is about the mapping between different perceptual domains such as hardness, sharpness, lightness, darkness and the phonemes we can speak.

Seventy years later, there are studies in which cognitive psychologists have actually speculated how much L, M, and B might be related to such shapes, and how likely P, T, and K are to be related to such shapes.

And this is where the numerically available mapping between curvatures, the relative mapping between curvature and shape, suddenly kicks in.

So I had an idea what would happen if I could do these things in reverse.

Thus was born a project called Remark, a collaboration between Zachary Lieberman and Ars Electronica Futurelab.

And this is an interactive installation that presents the fiction that words cast visible shadows.

It means stepping into a kind of magical light.

In doing so, I can see the shadow of my speech.

And they fly away from my head.

If the computer's speech recognition system can recognize what you say, it will read it out loud.

Otherwise, it produces shapes that are very closely phonetically coupled to the sounds you create.

Now let me introduce you to that video.

(Applause.) Thank you. So. And on this project I was working with the great abstract vocalist Jaap Bronk.

And he's the world's expert at staging "The Ursonate," a half-hour nonsense poem written by Kurt Schwitters in the 1920s. This poem is a very patterned half hour of nonsense.

And it's nearly impossible to do.

But Jaap is one of the world's experts at doing just that.

And in this project, we developed a form of intelligent real-time subtitles.

So these are our live subtitles, generated by a computer that recognizes the text of "The Ursonate" - fortunately Jaap knows it very well - and we're delivering that text at the same time as Jaap.

So all the text you see from now on will be generated by the computer in real time and will be a visualization of what he is doing with his voice.

Here you can see the setup with a screen with subtitles behind him.

have understood. So...

(Applause.) There's a full video online if you're interested.

During the live performance, reactions to it were divided. Some people understand live subtitles to be a kind of oxymoron. Because usually someone will create the subtitles later.

Then many people said, "What's the problem?

I always watch subtitles on TV. ”

Look? They don't imagine a person typing everything inside a booth.

In addition to whole bodies and voices, what I am very interested in these days is the use of eyes, or gaze, in terms of how people relate to each other.

The nonverbal information conveyed through the eyes is truly profound.

And this is one of the most interesting technical challenges currently active in computer science. From a great distance, with a camera that can actually make sense of how these tiny little balls are pointing in some direction, to be able to reveal what the user is interested in and where the user's attention is directed.

A lot of emotional communication takes place there.

So, through various projects, I have started to understand how people can interact with machines through their eyes.

And basically the question is, what if art knew we were looking at it?

How do we react in a way that acknowledges or overrules the fact that we see it?

And what could we do if we could look back?

And these are the questions that arise in the next project.

The first one I'm about to show you is called Eyecode, an interactive software that reads this little circle and says, "The trace left by the previous observer's gaze sees the trace left by the previous observer's gaze."

The idea is that it is an image entirely constructed from its own history viewed by different people within the installation.

Now let's switch it so that we can run a live demo.

So let's try this and see if it works.

have understood. Oh, and lots of nice bright videos.

I have a small test screen that shows it's working.

And what I'm going to do is hide it.

Here you can see that it records my eyes every time I blink.

Hello? And I... hello... okay.

And wherever I am, what's really happening here is an eye-tracking system trying to locate my eyes.

And if you go really far it gets blurry.

You know, you end up with blurry specks like this, but they might just resemble eyes in a very abstract way.

But if you get really close and look directly into this laptop's camera, you'll see these nice, sharp eyes.

You can think of this as a kind of eye-typing method.

And what you're typing is your eye record when you're looking into someone else's eyes.

That is, each person sees the facial expressions of others in front of him.

And this exists in large installations where there are potentially thousands of eyes that people could be staring at so that they could see who was looking at the people in front of them.

So let's add some more. flashes. flashes.

And then, again, you can see how I'm trying my best to find my eyes and estimate when they're blinking.

are you OK. Let's leave it at that.

That's this kind of recursive observation system.

(Applause.) Thank you.

The last two pieces I'm showing are basically in the new realm of robotics. For me it's new.

It is called an optical isolator.

And here's a minute of the old version of the video. have understood.

In this case, the opto-isolator blinks in response to its own blinking.

So it will blink 1 second after execution.

This is a device intended to reduce the phenomenon of line of sight to the simplest possible material.

It looks at you with only one eye, and excludes everything else about your face, but only considers the gaze as a sort of factor alone.

At the same time, they try to engage in the so-called well-known psychosocial gaze behavior.

If you look at it all the time, you'll be embarrassed and look away, or something like that.

have understood. The final project I want to show you is a new project called Snout.

(Laughter) It has an eight-foot nose and googly-eyed eyes.

(Laughter) And inside that is an 800-pound robotic arm that I borrowed from a friend (Laughter).

(laughs) Having good friends helps.

I am at Carnegie Mellon University. There is a great robotics lab there.

I'd like to show you something called Snout, and it's -- the idea behind this project is to make a robot that looks at you and seems to be constantly surprised.

(Laughter) The idea is, basically, if it's always like, "Huh? ... Huh?"

Therefore, it is also called double taker, double taker.

It's like always looking twice and saying "What?"

The basic idea is if it makes you look at you and be like, "Huh? Are those my shoes?"

"What do you have in your hair?" are you OK.

Checking him out...

For all you geeks out there, here's a little behind-the-scenes look.

It is equipped with a computer vision system and tries to observe people who move around the most.

Those are the targets.

I have a skeleton on top and that's what I'm actually trying to do.

It's really about trying to create a new body language for the new creature.

Of course Hollywood does this all the time.

But at the same time, body language can also convey something to the viewer.

This language tells us that we are surprised to see you and that we are interested in seeing you.

(Laughter) (Applause) Thank you. That's all for today.

And I'm really happy to be here. Thank you very much.

(applause)

Well this is 2009.

And today is the 200th anniversary of Charles Darwin's birth.

And all over the world, prominent evolutionists are eager to celebrate this.

And what they're trying to do is educate us about Darwin and just about every aspect of his life and how he changed the way we think.

I mentioned almost every aspect because there are aspects of this story that they haven't made clear.

And they seem worried about getting around it, stepping over it, or talking about something else.

So let's talk about it.

The question is why are we so different from chimpanzees?

Geneticists keep telling us how we are so closely related, so closely related, with very little difference in genes.

Still, if you look at the phenotype, there are chimpanzees and there are humans. They are strikingly different and not at all similar.

I'm not talking fluff about culture, psychology, or behavior.

I'm talking about earthly, core, measurable physical differences.

They are shaggy and walk on four legs.

That's a naked bipedal walker. why?

So -- (laughter) If I'm a good Darwinist, I have to believe there's a reason for that.

Something must have happened if it has changed so much.

what happened?

Fifty years ago it was a ridiculously simple question.

everyone knew the answer.

they knew what happened.

Ape ancestors stayed in trees. Our ancestors went out into the plains.

That explained everything.

We had to stand on our feet to look out over tall grass, chase animals, and free our hands to grab weapons.

And I overheated so much during the chase that I had to take off my fur coat and throw it away.

For generations, everyone knew it.

But in the 90s, something started to unravel.

Paleontologists themselves have looked a little more closely at accompanying microfauna that lived at the same time and place as hominids.

And they weren't savanna species.

And they turned to herbivores. And they were not savannah herbivores.

And they were so smart that they discovered a way to analyze fossilized pollen.

shock, horror.

The fossilized pollen was not from savannah plants.

Some of them even came from lianas hanging in the middle of the jungle.

That leaves us with a situation where we know that our earliest ancestors roamed on trees on four legs before the savannah ecosystem was born.

I didn't make this up.

It's not a minority theory.

everyone agrees with that.

Professor Tobias came from South Africa to give a lecture at University College London.

He said, "Forget everything I've been saying for the last 20 years. It was a mistake.

We have to go back to the drawing board and start over. ”

That made him very unpopular. They didn't want to go back to the drawing board.

So terrible things happen.

You have this beautiful paradigm.

You have believed it for generations.

No one doubts it.

You've built fancy things on top of it and trusted it to be rock solid.

And now it's been swept under you.

What is your occupation? What do scientists do then?

We know the answer because Thomas S. Kuhn wrote a seminal paper on this in 1962.

He said what scientists do when a paradigm fails is to keep working as if nothing happened.

(Laughter) If you don't have a paradigm, you can't ask questions.

So they say, "Yes, it's wrong, but assuming it was right..."

(Laughter.) And the only option left for them is to stop asking questions.

That's what they did now.

That's why you don't hear them talking about it. This is yesterday's question.

Some have even elevated it to a principle.

That's what we should do.

Harvard University's Aaron Filler said, "Isn't it time we stopped talking about selection pressure?

So let's talk about having chromosomes and genes.

And we just record what we see. ”

Charles Darwin must be spinning round and round in his grave!

He knew all about that kind of science.

And he called it science without hypotheses.

And he despised it from the bottom of his heart.

And if you're going to say, "Let's stop talking about selection pressure," you can throw Origin of Species out the window, because it's nothing but selection pressure.

And ironically, this was an opportunity for a paradigm collapse, and there was no need to wait for a new paradigm to emerge.

There were people waiting in the wings.

It has been waiting at this spot since 1960, when marine biologist Alister Hardy said, "What happened is that maybe our ancestors were more aquatic for a while."

He kept it hidden in himself for 30 years.

But then the press grabbed hold of it and all hell broke loose.

All his colleagues said, "This is outrageous.

You exposed us to public ridicule!

Never do that again. ”

And then the idea solidified that aquatic theory should be cast aside as part of the fringe of scientific madness, along with UFOs and yetis.

Well, I don't think so.

I think Hardy had a lot going on.

I would like to talk about a handful of what we call the traits of humanity, the things that make us different from other people and from all of our relatives.

Look at our bare skin.

Obviously, when we think of hairless animals, or hairless mammals, we think of aquatic animals such as dugongs, walruses, dolphins, hippos and manatees.

And then there are the couples who run wild in the mud like Babirusa.

And I'm tempted to think that maybe that's why we're naked.

When I suggested it, people said,

I mean, look at the elephant.

You forgot all about elephants, didn't you? ”

So in 1982 I said, "Maybe the elephant's ancestors were aquatic."

Cheerful laughter echoes!

"That crazy woman. It's time off again. What can I say?"

But now everyone agrees that elephants had an aquatic ancestor.

These naked pachyderms all turned out to have aquatic ancestry.

The last exception should have been the rhinoceros.

An extinct ancestor of a rhinoceros was discovered in Florida last year and "appears to have spent most of its time in the water".

So this means there is a close relationship between nudity and water.

It's an absolute connection, so it works in one direction only.

Not all aquatic animals are naked. look at the sea otter

However, it can be said that every animal that has become naked has been conditioned by water during its own lifetime, or the lifetime of its ancestors. I think this is important.

The only exception is the naked Somali mole rat, which never sticks its nose above the ground.

And try bipedal walking.

I can't find anyone here to compare. Because we are the only animals that walk upright on two legs.

But I can say this. All apes and all monkeys can walk on two legs for short periods of time if they choose to.

There is only one situation in which they always walk on two legs and that is when walking in water.

do you think that is important?

David Attenborough considers this important as a possible beginning of our bipedalism.

Look at the fat layer.

We have a layer of fat all over our body under our skin, whereas other primates have none at all.

Why should it be there?

If you look at other aquatic mammals, they know that most land mammals have fat deposits inside their body walls, such as around the kidneys and intestines, that begin to migrate outward and spread to the inner layers of the skin.

Perfect for whales. No fat on the inside, just fat on the outside.

In our case, we cannot avoid the suspicion that it is starting to happen.

This layer lines the skin.

This is the only possible explanation for why humans can be so unlucky that they can become extremely obese, physically incapable of any other primate.

Very strange and obvious, but never explained.

The question is, why can I speak?

we can talk

And gorillas cannot speak. why?

It has nothing to do with teeth, tongue, lungs, etc. It is purely concerned with conscious control of breathing.

Nor can you train a gorilla to say "ahh" when asked.

The only creatures that can consciously control their breathing are diving animals and diving birds.

It was an absolute prerequisite for us to be able to speak.

And then there's the fact that it's streamlined.

Imagine a diver jumping into the water. Almost no splash.

Imagine a gorilla performing the same maneuver. Compared to the gorilla, we can see that we are in the middle of being shaped like a fish.

My point is that for over 40 years this aquatic thought has been misclassified as the fringe of madness, not the fringe of madness.

And the irony is that they're not shunning aquatic theories to defend their own theories they all agree on and love.

there is nothing there.

They evade aquatic theory to protect the vacuum.

(Laughter.) (Applause.) How do they react when I say this?

One very common response I've heard about 20 times so far is, "But it's been investigated.

When Hardy first submitted his paper, they did some serious research on it. ”

That's unbelievable.

I've been looking for evidence of that sort of incident for 35 years and have come to the conclusion that it's one of those urban legends.

It has never been done.

Sometimes I ask people and they say, "I love aquatic theory!"

Everyone likes aquatic theory.

Of course they don't believe it, but they like it. ”

Well, I say, "Why do you think that's bullshit?"

They say, "Well...

Everyone I talk to says it sucks.

And how can they all be wrong? ”

The answer to that is a resounding yes, they could all be wrong.

History is littered with cases where everything went wrong.

(Applause.) When you have a scientific problem like that, you can't just figure out the numbers and say, "More people say yes than say no."

(Laughter) Apart from that, some heads count more than others.

some of them came.

There was Professor Tobias. he came

Daniel Dennett, here he comes.

Sir David Attenborough, he has come.

who else? Please come.

The water is lovely.

(Applause.) And now we must look to the future.

Eventually one of three things will happen.

It will continue for the next 40, 50, 60 years.

"Well, let's not talk about that. Let's talk about something interesting."

It would be very sad.

The next thing that could happen is that a young genius will come along and say, "I found it."

It wasn't savannah, it wasn't water, it was this! ”

There are no indications that it will happen.

I don't think there is a third option.

So the third thing that might happen is something very beautiful.

Looking back at the early part of the last century, there was a lot of quarreling and bitterness between Mendel's followers and Darwin's followers.

It ended with a new synthesis, a blend of Darwinian and Mendelian ideas.

And I think the same thing happens here.

A new composition is obtained.

Hardy's ideas and Darwin's ideas will merge.

And we can move forward from there and actually get somewhere.

that would be great.

It would be great for me if it happens soon.

(Laughter) Because I'm older now than George Burns said, "At my age, I won't even buy a green banana."

(Laughter.) So what is going to happen, and if it does happen, what is stopping it?

It can be said in three words.

Academia says no.

They decided in 1960 that "it belongs to UFOs and Yukio".

And changing their minds is not easy.

Professional magazines are not going to touch it with barge poles.

There is no mention of it in the textbooks.

The syllabus doesn't even mention the fact that we're naked, much less explore why.

The academic-inspired Horizon isn't going to touch it with a barge pole.

As such, we have never heard it claimed, except as a joking reference to those on the fringes of madness.

I'm not quite sure where this dictat came from.

At the top, someone is admonishing, "Don't believe the aquatic theory."

And if you want to progress in this profession and believe in it, it's going to get in the way, so better keep it to yourself. ”

So I get the impression that part of the scientific community has turned into a kind of clergy.

But you know, Richard Dawkins taught us how to handle the priesthood, so it feels good to me.

(Laughter) He says, "First, it must refuse to give it all the excessive awe and respect it has been trained to receive."

right. Let's move on.

And second, "never be afraid to rock the ship," he says.

I will go along with it.

thank you very much.

(applause)

please look at this photo.

It presents us with a very attractive puzzle.

These African students do their homework under streetlights at the capital's airport because there is no electricity at home.

Well, I haven't met these particular students, but I've met students like them.

Let's pick just one. For example, a person in a green shirt.

Let's name him too: Nelson.

Nelson must have a mobile phone.

So here's the puzzle.

If Nelson has access to cutting-edge technology like cell phones, why can't he use the 100-year-old technology that generates light in his home?

Well, in a nutshell, the answer is "rules".

Bad rules can prevent win-win solutions like the ones people get when new technology becomes available to someone like Nelson.

What are the rules?

The country's power companies operate under rules that require them to sell electricity at very low subsidized prices. In fact, its price is so low that it loses money on every unit it sells.

Therefore, there are no resources or incentives to attract many other users.

The president wanted to change this rule.

He has seen that it is possible for businesses to set another set of rules, namely rules, to incentivize them to register more customers in order to make a small profit.

The cell phone company from which Mr. Nelson buys phones operates under such rules.

The president has seen how well those rules work.

So he tried to change the electricity tariff rules, but was met with a storm of outcry from businesses and consumers who wanted to keep the existing subsidized tariffs.

As such, he was bound by rules that prevented him from realizing a solution favorable to his country.

And Nelson was to study under a streetlight.

The real challenge is figuring out how the rules can be changed.

Are there rules that can be developed to change the rules?

My point is that there are general, abstract insights that we can put into practice. It's about giving people more choice, and in many countries leaders are people too, if only we could give more choice.

(Laughter) But it's useful to present a conflict between these two.

Because the choices you want to give leaders, like giving the president the choice to raise electricity prices, rob the business community of the choices they want.

They want the option of being able to continue consuming subsidized electricity.

Therefore, applying a force to one or the other creates tension or friction.

But if we could find a way to give both of them more options, we would have a set of rules for rule changes to get out of the trap.

Now Nelson also has access to the Internet.

And if you want to see the harmful effects of rules, how they keep people in the dark, look at NASA's photos of Earth at night, he says.

Check out Asia in particular.

If you zoom in here, you can see the outline of North Korea. It's like a black hole compared to neighboring countries.

Now, it wouldn't surprise me to learn that North Korean rules keep people in the dark.

However, it is important to recognize that North and South Korea started with the same set of rules, both in terms of laws and regulations, but also in a deeper sense of understanding, norms, culture, values ​​and beliefs.

When they parted, they chose to take very different paths to a set of rules.

So we can change. We humans can change the rules we use to interact with each other, for better or worse.

Now let's look at another region, the Caribbean.

Zoom in on Haiti to get an overview here.

Haiti is also a dark country compared to neighboring Dominican Republic, which has about the same number of inhabitants.

Both of these countries are darker than Haiti or Puerto Rico, which has half the population of the Dominican Republic.

Haiti warns us that weak governments can lead to bad rules.

It's not just that the rules are bad because the government is too strong and oppressive like North Korea.

You want to create an environment with good rules, but you can't just break them.

We also have to find a way to build up.

Now China is dramatically demonstrating both the potential and the challenges of complying with the rules.

Back to the beginning of the data presented in this chart, China was the world's tech leader.

The Chinese pioneered technologies such as steel, printing, and gunpowder.

But the Chinese, at least in their time, never adopted an effective rule to promote the spread of such ideas, the profit motive that might promote their spread.

And they quickly adopted rules that slowed innovation and cut China off from the rest of the world.

So while the rest of the world has been innovating, not only in terms of developing new technologies, but also in terms of developing newer rules, China has been cut off from those advances.

Revenues in the country remained stagnant while the rest of the world saw rapid growth.

The following chart shows more recent data.

This plots China's median income as a percentage of US median income.

You can see that in the 50's and 60's it hovered around 3%.

But something changed in the late 70s.

Growth started in China. China is rapidly catching up with the United States.

Returning to the map at night gives a hint of the process leading up to China's dramatic rule change.

The brightest spot in China, visible at the edge of the contour here, is Hong Kong.

Hong Kong was part of China and for most of the 20th century operated under a very different set of rules than the rest of mainland China. The rules were copied from the market economy of the time and controlled by the British.

In the 1950s, Hong Kong was a place where millions of people from the mainland could start jobs like sewing shirts and making toys.

However, improving my skills to get on the process of increasing my income led to very rapid growth there.

Hong Kong was also a model that leaders like Deng Xiaoping could emulate when they decided to shift the entire mainland to a market model.

But Deng Xiaoping instinctively understood the importance of giving people choice.

So, instead of forcing an immediate shift to a market model across China, it went ahead with the creation of a number of special zones that could in some ways do what Britain did. It was about making an opportunity to follow market rules available to those who wanted to opt-in.

So they created four special economic zones around Hong Kong. These are areas where the Chinese could come and work and where cities grew rapidly. There is also a zone where foreign companies can enter and make things.

One of the zones next to Hong Kong is the city of Shenzhen.

There's a Taiwanese company in that city that made the iPhone you have, and they made it with Chinese workers who immigrated to Shenzhen.

After the four districts, therefore, there were fourteen coastal cities open in the same sense, and finally found success in these places for the people to choose from and flocked to them for the advantages offered.

The successes demonstrated there have led to a consensus on the transition to a market model for the entire economy.

Well, the Chinese example shows some points.

One is to protect people's choices.

2: Operate at the right scale.

If we try to change the rules of the village, we can, but the villages are too small to reap the benefits that millions of people would get if they all worked under good rules.

On the other hand, the state is too big.

If you want to change the rules of this country, you can't give some people a chance to wait and see and others to look ahead and try the new rules.

But cities give us the opportunity to create new places with new rules that people can opt into.

And they are big enough for millions of people to get all the benefits of working together under the right rules.

So the proposal is to envision something called Charter City.

We start with a charter that specifies all the rules needed to bring in the people we need to build our city.

We need to attract investors to build infrastructure such as power systems, roads, ports, airports and buildings.

First of all, it is necessary to attract companies that will employ people who move there.

And we need to attract families and residents who will come and live there permanently, raise their children, educate them and get their first jobs.

With that charter, people will move there.

Cities can be built.

And you can scale this model.

Let's do it again and again.

You need good rules to make it work. We have already discussed that.

They are captured by the Charter.

People's choice is also necessary.

Considering the possibility of building a city on uninhabited land, it really comes into the model.

Start from no man's land.

People can live under the new charter, but no one will be forced to live under it.

The last thing you need is a leader selection.

And to achieve the choices we want our leaders to have, we need to consider the possibility of partnerships between nations. That is, a case of state de facto cooperation, first creating a small enclave of the market model and then expanding it across China, much like how China and the UK have worked together.

In a way, Britain, through its actions in Hong Kong, has inadvertently done more to reduce world poverty than any of its aid programs in the last century.

So if we can allow this kind of partnership to replicate this again, we can extend that kind of advantage all over the world.

In some cases, this will involve the delegation of responsibility, the delegation of control to pass on certain management responsibilities from one country to another.

Now, when I say this, some people are starting to think, "So, isn't this just reviving colonialism?"

it's not. However, it is important to recognize that the kinds of emotions that arise when you start thinking about these things can get in the way, hold you back, and shut off your abilities and interest in exploring new ideas.

Why is this not like colonialism?

The bad thing about colonialism, and what's still bad about some of our aid programs, is that it contained elements of coercion and contempt.

This model is all about choice, both for leaders and for people living in these new places.

And choice is the antidote to coercion and condescension.

Now let's talk about how this plays out in practice.

Take a particular leader, Cuban leader Raul Castro, for example.

Castro must have seen an opportunity to do to Cuba what Deng Xiaoping did to China, but Cuba's island does not have Hong Kong.

But he has a little bit of light that holds a very special place in the South.

Surrounding Guantanamo Bay is an area where the treaty gives the United States administrative responsibility for an area roughly twice the size of Manhattan.

Castro went to the Prime Minister of Canada and said, "The Yankees have a terrible PR problem.

they want to get out.

Canada, why don't you take over?

Build a special management zone -- do it.

Please allow a new city to be built there.

Let lots of people come in.

Let's make Hong Kong closer.

Some of my people will move to that city.

Others will shy away. But this will be the gateway that connects the modern economy and the modern world to our country. ”

So where else can you try this model?

Well, Africa. I have spoken with African leaders.

Many of them fully understand the concept of special zones where people can opt-in in principle.

A rule to change rules.

It's a way of creating new rules and allowing people to opt-in without coercion or coercion-enforced opposition.

They also fully understand the idea that in some cases working with partner countries can make more credible commitments to long-term investors, such as those building ports in new cities or building roads.

Perhaps there is also an arrangement a bit like an escrow account where the other country takes responsibility for depositing land in an escrow account.

Africa also has a lot of land on which new cities can be built.

This photo was taken while flying along the coast.

With such a vast expanse of land, it is a land where hundreds of millions of people can live.

Now, if we generalize this to not just one or two charter cities, but dozens of cities, cities that will help make room for the hundreds of millions, perhaps billions, of people who will migrate to cities in the next century, will they have enough land?

Across the world, the misleading thing about looking at the lights at night is that visually, much of the world seems to have already been built.

Now let me explain why it's wrong.

Let's express this whole land.

Turn it into a square representing all cultivated land on Earth.

And suppose these points represent land already occupied by a city of 3 billion people today.

Moving the point to the bottom of the rectangle reveals that the existing 3 billion urban inhabitants occupy only 3% of the arable land on earth.

So if you want to build a city for another billion people, these would be the dots.

3 percent of the cultivated area becomes 4 percent.

By building more cities that people can move around in, we can dramatically reduce the human footprint on the planet.

And if these are cities governed by good rules, they can be cities where people are safe from crime, safe from disease and poor sanitation, and where people have a chance of getting a job.

They can get basic utilities such as electricity.

their children can be educated.

So what does it take to start building your first charter city and expand it to build more cities?

A manual would be helpful.

(Laughter) What a university professor can do is write down details that might be included in this manual.

You don't want us to run cities or design them.

You can't let a scholar out into the wild. (Laughter) But, assuming Canada isn't the only one doing business with Raul Castro, for example, you could ask us the following question.

Perhaps Brazil will join, Spain will join as well. And perhaps Cuba wants to be one of the partners in a four-way joint venture.

How do you write a treaty for that?

There's not a lot of precedent for this, but it's an easy fix.

How are we going to fund this?

We found Singapore and Hong Kong to be cities that greatly increased the value of the land we owned when we started our business.

Profits from the value of the land can be used to pay for police, courts, etc., but we also have a school system and a health care system, which makes the area a better place to live and a higher income for people. Additionally, it increases the value of the land.

So the incentives for people to help build and build this zone and set the ground rules are going in a very good direction.

There are many more such details.

How can we make buildings affordable and affordable for people starting their first career building things like the iPhone, energy efficient, and safe enough not to collapse in an earthquake or hurricane?

There are many technical details that need to be worked out, but those of us who have already begun to pursue these things already see that there are no obstacles or obstacles that prevent us from delivering a truly global win-win solution, other than a lack of imagination.

Let's close with this photo.

It is through the power of ideas that we are so wealthy despite the abundance of people on the planet.

We can share ideas with others, and when others discover ideas, they will share them with us.

It is different from scarce goods, where each of us gets less by sharing.

Everyone can get more out of sharing ideas.

When we think of ideas in this way, we usually think of technology.

But there is another class of thinking. It's the rules that govern how we interact with each other. Rules like, let's set up a tax system to support research universities that provide some kind of knowledge for free.

Let's create a system in which the ownership of land is registered with the government office and the people can deposit it as collateral.

If we can continue to innovate in the space of rules, especially in the sense of coming up with rules to change the rules so that we don't get stuck in bad rules, then we can continue to make progress and truly make the world a better place, and people like Nelson and his friends no longer have to study under the streetlight. thank you.

(applause)

To bring this story up to you, I would like to say a few words about my qualifications. Because, to be honest, we shouldn't listen to old people who have opinions about COVID-19.

(Laughter) I have been working in the field of global health for about 20 years. My technical expertise is in the health care system and what happens when the health care system goes through a severe shock.

I have also worked in global health journalism. I have written about global health and biosecurity in newspapers and on the web. A few years ago I published a book about the major global health threats facing our planet.

I have supported and led epidemiological efforts, from evaluating Ebola treatment centers to investigating tuberculosis transmission in health care facilities to avian flu preparedness.

I have a master's degree in international health.

i am not a doctor i am not a nurse.

My specialty is not patient care or personal care.

My specialty is looking at populations and healthcare systems, what happens when disease progresses to large levels.

If you were to rank the sources of global health expertise on a scale of 1 to 10, 1 would be random people ranting on Facebook and 10 would be the World Health Organization. You could probably classify me as a 7 or 8.

So keep that in mind when I speak to you.

Let's start with the basics here. Because I think it's lost in the media frenzy about COVID-19.

So, COVID-19 is a coronavirus.

Coronaviruses are a specific subset of viruses and have some unique characteristics as viruses.

They use RNA instead of DNA as their genetic material, and the surface of the virus is covered with spikes.

They use those spikes to invade cells.

Those spikes are the coronavirus corona.

COVID-19 is known as the novel coronavirus because, until December, only six coronaviruses were known.

Novel coronavirus infection (COVID-19) is the seventh.

It's new to us.

Only the genes were sequenced and named.

That's why it's new.

You may remember SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome), they were coronaviruses.

And they are both called respiratory syndromes. That's because the coronavirus invades the lungs.

It does not vomit, bleed or bleed from the eyeballs.

The novel coronavirus disease (COVID-19) is no exception.

It causes respiratory symptoms ranging from dry cough and fever to fatal viral pneumonia.

And that range of symptoms is one reason why tracking this epidemic is so difficult in practice.

Many people get COVID-19, but the symptoms are so mild that they don't even go to a medical facility.

Not registered in the system.

Children in particular are living very comfortably with COVID-19, which we should all be grateful for.

Coronaviruses are zoonotic and are transmitted from animals to humans.

Some coronaviruses, such as the novel coronavirus disease (COVID-19), spread from person to person.

Like COVID-19, it travels faster and farther from person to person.

Because zoonotic diseases have animal hosts, they are very difficult to get rid of.

One example is bird flu. Avian influenza can be eradicated in livestock, turkeys and ducks, but it continues to recur every year because it is carried by wild birds.

You don't hear about avian flu because it doesn't spread from person to person, but it occurs every year on poultry farms around the world.

The new coronavirus was most likely transmitted from animals to people at a wildlife market in Wuhan, China.

Now let's talk about the less basic parts.

This is not the last pandemic we will ever see.

More infections will spread and more epidemics will occur.

It may not be possible. It is a matter of course.

And it is a result of how we humans interact with the Earth.

Human choice has forced us into a situation where we see more infections.

Part of it is about climate change and how a warming climate makes the world more livable for viruses and bacteria.

But it also means how we venture into the last unexplored space on Earth.

When the Amazon rainforest is burned and plowed for cheap ranching land, when the last patches of forest in Africa are turned into farms, and when wild animals are hunted to extinction in China, humans come into contact with wild animal populations they have never come into contact with before, and those populations are succumbed to new kinds of diseases, such as bacteria and viruses, for which we are not prepared.

Bats in particular have a knack for carrying diseases that can be transmitted to humans, but bats are not the only animals to do so.

So as long as we continue to reduce remote remote areas, outbreaks will continue to occur.

Quarantine and travel restrictions alone will not stop the spread of the virus.

That is the first impulse that everyone has. "Let's stop the movement of people. Let's prevent this outbreak from happening."

In practice, however, proper isolation is very difficult to implement.

It's really hard to set travel restrictions.

Even countries like the United States and South Korea, which have invested seriously in public health, cannot actually introduce such restrictions quickly enough to stop the epidemic immediately.

There are logical and medical reasons for that.

Looking at the current situation with COVID-19, it seems that a symptom-free period of infection can last as long as 24 days.

So people are walking around with this virus without showing any signs.

they are not going to be isolated. No one knows that quarantine is necessary.

Quarantine and travel restrictions also have real costs.

Humans are social animals and will resist any attempt to keep them in place or pull them away.

In the Ebola epidemic, we found that as soon as we put quarantine measures in place, people started trying to avoid them.

Individual patients, knowing that there are strict isolation protocols, may not get medical care because they fear the health system, cannot afford care, or do not want to be separated from family and friends.

Politicians and government officials may hide real information for fear of triggering quarantine protocols if they know that talking about an outbreak or an infected person will put them in quarantine.

And, of course, it is this kind of avoidance and dishonesty that makes it so difficult to track outbreaks.

Improving quarantines and travel restrictions can and should be done, but they are not the only options, nor are they the best options for dealing with these situations.

The real way to reduce the severity of infectious disease outbreaks in the long term is to build a global health system that supports core health functions in all countries of the world so that all countries, including the poorest, can rapidly identify and treat new outbreaks.

China has been widely criticized for its handling of the novel coronavirus disease (COVID-19).

But really, what would happen if Covid-19 broke out in Chad, where there are three and a half doctors per 100,000 people?

What if the epidemic broke out in the Democratic Republic of the Congo, which had just released its last Ebola patient from treatment?

The truth is that these countries do not have the resources to respond to the epidemic, they cannot treat people, they cannot report the epidemic fast enough to help the rest of the world.

I led the evaluation of Sierra Leone's Ebola Treatment Center, and indeed, local doctors in Sierra Leone recognized the Ebola crisis, first as a dangerous, contagious hemorrhagic virus, and then as Ebola itself.

But even after identifying it, they didn't have the resources to respond.

There were not enough doctors, not enough hospital beds, and not enough information on how to treat Ebola and how to implement infection control.

Eleven doctors have died in Sierra Leone from Ebola.

There were only 120 people in the country when the crisis began.

In contrast, the Dallas Baylor Medical Center has over 1,000 physicians.

Such inequality kills people.

First, when the outbreak starts they kill the poor, then when the outbreak spreads they kill people all over the world.

If we really want to slow these epidemics and minimize their impact, we need to make sure that all countries in the world have the capacity to identify, treat, and report new diseases so that information can be shared.

Covid-19 will put a heavy strain on the healthcare system.

COVID-19 has also revealed some real weaknesses in the global medical supply chain.

A lean system of just-in-time ordering is great when things are going well, but in times of crisis it means you have no spares.

If a hospital or country runs out of masks and personal protective equipment, they don't have a large warehouse full of boxes to get extra.

You have to order more from the supplier and wait for the supplier to produce it and usually have to wait for it to be shipped from China.

This is the time lag when it's most important to act quickly.

If we were perfectly prepared for the novel coronavirus disease (COVID-19), China could have identified the epidemic much earlier.

It would have been ready to provide care to the infected without having to build new buildings.

They would have shared honest information with the public so that we would not see such crazy rumors spread on Chinese social media.

It would have started reporting to national health systems and sharing information with global health authorities so they could be prepared when the virus spreads.

The country's health system could then stockpile the necessary protective gear and train health care providers in treatment and infection control.

It would be nice if there was a science-based protocol for what to do in the event of a patient becoming infected on a cruise ship.

And real information will reach people everywhere, and we won't see embarrassing and shameful cases of xenophobia like Asian-looking people being attacked on the streets of Philadelphia.

But even with all this in place, epidemics will still occur.

The choices we are making about how we occupy this planet make it inevitable.

As far as expert consensus on COVID-19 is concerned, it is: Here in the United States and globally, things are going to get worse before they get better.

There have been cases of human infections that were not caused by trips back home, but just occurred in the community, and some people have been infected with COVID-19 without even knowing where the source of the infection came from.

These are signs that the spread is getting worse, not that it is under control.

Depressing, but not surprising.

When global health experts talk about new virus scenarios, this is one of the scenarios they focus on.

Everyone hoped to get well, but when experts talk about virus planning, this is the situation and how to anticipate the virus's movements.

I would like to end with some personal advice here.

wash hands.

Wash your hands often.

I know you're already washing your hands well, because you're not a creepy person, but let's wash your hands more.

Set up cues and routines in your life to encourage you to wash your hands.

Wash your hands every time you enter or leave the building.

Wash your hands when entering and leaving meetings.

Let's do a ritual centered on hand washing.

Sanitize your mobile phone.

You are always touching that phone with dirty, unwashed hands.

I know you take it to the bathroom.

(Laughter) So consider sanitizing your phone and using it less often in public.

Perhaps TikTok and Instagram are just for home use.

Do not touch your face.

Do not rub your eyes.

Do not bite your nails.

Do not wipe your nose with the back of your hand.

I mean, don't do it anyway.

(laughs) Please don't wear a mask.

Face masks are for sick people and healthcare workers.

In case of illness, face masks prevent coughing and sneezing and protect those around you.

And if you're a healthcare provider, face masks are one tool in a set of tools called personal protective equipment that you're trained to use to care for your patients and keep yourself from getting sick.

When a normally healthy person wears a mask, their face just gets sweaty.

(laughter) Keep masks in stores for doctors, nurses and the sick.

If you think you have symptoms of COVID-19, stay home and call your doctor for advice.

Remember that if you are diagnosed with COVID-19, it is usually very mild.

And if you are a smoker, now is the perfect time to quit.

So, if you are a smoker, now is always a great time to quit, but if you are a smoker and you are worried about COVID-19, I assure you that quitting is absolutely the best thing you can do to protect yourself from the worst effects of COVID-19.

Covid-19 is terrifying while almost all news feels scary.

And there are many bad but attractive options for dealing with it. Panic, xenophobia, agoraphobia, authoritarianism, the oversimplified lies that make us think that hate, anger and loneliness are the solution to the epidemic.

But it's not.

They only weaken our readiness.

It also has a tedious but useful set of options you can use to respond to the outbreak, such as improving medical care here and there. Invest in healthcare infrastructure and disease surveillance to know when new diseases emerge. Building healthcare systems around the world. We are considering strengthening our supply chain in case of emergencies. And thanks to better education, we will be able to talk about the mathematics of disease incidence and risk without just blindly panicking.

We must be guided by impartiality here. Because in this situation, like so many others, fairness is actually in our own interest.

Thank you very much for listening to me today. Wash your hands when you leave the theater. May I tell you first?

(applause)

[How can the coronavirus pandemic be controlled?] [From infectious disease expert Adam Kucharski] [Question 1: What does containment mean in terms of the spread of infection?] Containment is the idea that we can focus on controlling the infected and their contacts.

So, without causing disruption to the wider population, infected people can come in, isolate them, figure out who they have been in contact with, who may be infected, and then follow up and possibly quarantine those people to make sure no further infections occur.

So this is a very focused, targeted method, and it worked very well in the case of SARS.

But in the case of this infection, some cases go undetected or go undetected, so I think we need to make sure that the majority of people at risk are caught.

If a few slip through the net, an epidemic can occur.

[Question 2: What happens next if containment is not enough?] In that respect, it will be about a major shift in our social interactions.

To do so, of the potential opportunities for the spread of the virus by these types of close contacts, the entire population would need to potentially reduce these contacts by two-thirds, on average, in order to bring the virus under control.

It may be due to working from home, lifestyle changes, changes in crowds and types of places to go for dinner.

And of course, some of these measures, such as school closures, just try to reduce the social mixing of the population.

[Question 3: What are the risks that people need to consider?] It's not just who you shake hands with, but who you keep shaking hands with.

And I think we need to think about these second-class steps. You may consider yourself to be in a low-risk, younger group, but you are often only a short distance away from someone who could be hit very hard by this.

And I think we need to be really socially conscious, and I think this can be very dramatic in terms of behavior change, but we need to mitigate the impact that we might face.

[Question 4: How far apart should people be from each other?] I know it's hard to pinpoint, but one thing to keep in mind is that this is a kind of aerosol, and there's not much evidence that it can travel very far. It's a fairly short distance.

I don't think you can transmit the virus in any way by sitting a few feet away from someone.

It's a closer interaction, which is why we're witnessing so many transmission events in meals and in very close groups.

Because imagine from there a virus can get onto your surface, your hands, your face. In fact, it is precisely such situations that require us to think more.

[Question 5: What safeguards should countries take?] I think that's what people are trying to piece together in terms of what works first.

It has only been in recent weeks that we have had a sense that the situation can be controlled with this level of intervention, but of course not all countries can do what China can do, and some of these measures impose a tremendous social, economic and psychological burden on their citizens.

And of course there is a time limit.

Six weeks of forced labor in China is hard to maintain. So we need to consider the trade-offs of all that we can ask of people, and what will have the greatest impact on real relief.

[For more information, see the Centers for Disease Control and Prevention] [World Health Organization]

In 1958, Rachel Carson received a letter about a songbird suddenly falling from a tree branch.

The authors attributed their deaths to a pesticide called DDT that exterminators sprayed on nearby swamps.

The letter gave Carson the push he needed to investigate DDT.

She had already heard from scientists and conservationists concerned that the widespread use of the pesticide poses a threat to fish, birds and possibly humans.

She began her research through government contacts while working for the U.S. Fisheries Service for many years.

She asked, "What has already silenced the voices of Spring?" In 1962, Carson published his findings in "Silent Spring."

Her book documents the misuse of chemicals and their damage to nature and human health.

"Silent Spring" quickly aroused both admiration and vehement opposition, as well as vicious personal attacks against its author.

How did this mild-mannered biologist and author create such controversy?

Carson started his career as a diligent graduate student at Johns Hopkins University, juggling biology studies and a part-time job.

Still, she had to drop out of school before completing her PhD in order to support her ailing father and sister.

Carson found a part-time job writing a radio show about marine biology at the Fisheries Department.

Her ability to write material for public attention impressed her superiors, and in 1936 she was the second woman hired full-time at the department.

In 1941 she published the first of three books on the ocean, combining science with lyrical meditations on the underwater world.

These quests resonated with a wide audience.

In "Silent Spring" Carson drew attention to how human actions threaten the balance of nature.

DDT was originally used during World War II to protect crops from insects and to protect soldiers from insect-borne diseases.

After the war, it was regularly sprayed over large areas to combat pests, often with unintended consequences.

An Attempt to Eradicate Fire Ants in the Southern United States

It killed wild animals indiscriminately, but rarely eliminated ants.

Despite these and other mishaps, the USDA and chemical companies have praised the benefits of DDT.

There has been little regulation or public awareness of its potential harm.

But Carson has shown how overuse of chemicals can lead to the evolution of resistant species, which in turn drives the development of even more deadly chemicals.

Because DDT is insoluble in water, it accumulates over time in the environment, the bodies of insects, the tissues of animals that ingest those insects, and eventually humans, she argued.

She suggested that exposure to DDT might change the structure of genes, and it's unclear how that might affect future generations.

The reaction to "Silent Spring" was explosive.

For many, the book was a call to regulate substances that could cause devastating harm.

Others objected that Carson did not mention DDT's role in controlling insects that pose a threat to human health.

Former Agriculture Secretary Ezra Taft Benson demanded to know "why unmarried women with no children are so worried about genetics." He dismissed Carson as "probably a communist." A lawyer for a pesticide maker has alluded to Carson and his supporters as an "evil influence" trying to portray the company as "immoral." In fact, while the benefits of chemicals were widely known, Carson focused on the dangers of chemicals because they were not widely understood.

She rejected the popular belief that humans should and can control nature.

Instead, she asked people to cultivate "our own maturity and mastery, not nature's." Carson died of cancer in 1964, just two years after Silent Spring was published.

Her work inspired a generation of environmental activists.

In 1969, under pressure from environmental activists, Congress passed the National Environmental Policy Act, which requires federal agencies to assess the environmental impact of their actions.

To enforce this law, President Richard Nixon created the Environmental Protection Agency.

And in 1972 the EPA partially banned the use of DDT.

Long after her death, Rachel Carson continued to champion nature through the impact her writing left behind.

If you haven't ordered it yet, I think it's common for rigatoni with spicy tomato sauce to go best with small bowel ailments.

(Laughter) Sorry, but I feel like we should be doing stand-up here because of the setting.

No, all I want to do is take you back to 1854 London for the next few minutes and briefly explain this epidemic. In many ways, I think it helped shape the world we live in today, especially the cities we live in today.

This period in the mid-19th century, 1854, is very interesting in London's history for many reasons.

But I think the most important thing is that London was a city of 2.5 million people, the largest city on earth at the time.

But it was also the largest city ever built.

So the Victorians were trying to survive and at the same time invent a whole new scale of life. This scale of life, as you know, is now called "metropolitan living".

And at this point in the mid-1850s, it was in many ways a total disaster.

These were basically cities coexisting with modern industrial towns with Elizabethan public infrastructure.

For example, people used to keep cesspools of human waste in their basements just to make them feel a little offended. About 1 to 2 feet deep.

And they threw a bucket in there hoping that somehow it would go away, but of course it never really goes away.

And all of this basically accumulated to the point where just walking around the city was incredibly uncomfortable.

It was a stinking town. People will be shocked not only because of the cesspool, but also because of the large number of livestock in the city.

It wasn't just horses, people had cows in their attics, and to milk them, they literally ran out of milk and hoisted them up to death in their attics, then dragged them down the street to bone boilers.

So just walking around London at this point just overwhelms you with this stench.

And what ended up happening was that the entire emerging public health system became convinced that it was the smell that was killing everyone, creating a disease that spread throughout the city every three or four years.

And cholera was actually the greatest killer of our time.

It arrived in London in 1832, and another epidemic occurred every four or five years, killing 10,000 and 20,000 people in London and throughout England.

So officials became convinced that the smell was the problem.

I needed to get rid of the smell.

So, in fact, they concocted some early legislation to establish public health interventions in the city's system. One of them, called "nuisance," called on everyone to empty their cesspits as much as possible and dump all their waste into the river.

Because it smells so much better when you take it off the street, and oh yeah, we drink water from the river.

So what really happened is that they have increased the cholera outbreak. Because, as we now know, cholera actually exists in water.

This is a waterborne disease, not an airborne one.

It is not something to be smelled or inhaled. it is ingested.

And one of the founding moments of public health in the 19th century polluted London's water supply far more effectively than modern bioterrorists could have dreamed.

This was the situation in London in 1854. In the midst of this carnage and aggression, in the midst of the scientific confusion about what was actually killing people, a very talented classical 19th-century multidisciplinary scholar named John Snow, a local doctor in Soho, London, had been arguing for about four or five years that cholera was in fact a water-borne disease, but basically no one had been convinced of this.

Public health officials largely ignored his remarks.

And he has argued this in many papers and has done a lot of research, but nothing really stuck.

And part of that is what makes this story so interesting to me is that, in a way, this is a great case study of how cultural change happens, how good ideas eventually come to triumph over worse ideas.

And Snow struggled for a long time to get this great insight that everyone ignored.

Then, one day on August 28, 1854, at 40 Broad Street, a little child, a five-month-old girl, whose first name he did not know, only Baby Lewis, somehow contracted cholera and collapsed.

You can't see much on this map, but this is the map that will be central to the rest of my book.

Here in the middle of SoHo, in this working-class neighborhood, this girl got sick. It turned out that the cesspool, still in use despite the nuisance laws, was adjacent to a local watering hole known for the best water in all of Soho and a very popular water pump for all residents of Soho and the surrounding area.

And this little girl inadvertently polluted the water of this popular pump, causing one of the most horrific outbreaks in British history about a few days later.

Literally 10 percent of the neighborhood died in seven days, and many more would have died had people not fled after the initial epidemic began.

I mean, this was an incredibly terrifying event.

There was a scene where the whole family died alone from cholera for 48 hours in a small one-room apartment.

It's an extraordinary and terrifying sight.

Snow, who lived nearby, had heard of an outbreak of cholera and had entered the beast's belly in this remarkable act of courage. Because he thought it might convince people that the real threat of cholera was not in the air but in the water supply.

He speculated that the clustered outbreaks probably involved a single point source.

There was one thing everyone was trying to do. That's because it didn't have the traditional, slow infection route you'd expect.

So he went there and started interviewing people.

He eventually turned to this amazing other person for help, like the other main character in the book. This man, Henry Whitehead, was a local pastor, and although he was no expert in science, he was incredibly socially connected. He knew everyone in his neighborhood.

And, like Whitehead, they were able to track many cases of people who either drank from the pump or didn't.

And finally, Snow created a trend map.

He noticed that people who drank water from the pump were getting sick more and more.

Those who did not drink water from the pump did not get sick.

And he thought about expressing it as some sort of statistical table of people living in different areas, non-living, non-living percentages, etc., but he eventually came up with the idea that what was needed was something visible.

It's kind of a higher level look at all this activity that was happening in the neighborhood.

So he made this map. The map essentially represented all deaths in the neighborhood with a black bar at each address.

As you can see on this map, the pump is right in the center of it, and about 15 people died in one of the houses along the way.

And the map is actually a little wider.

Deaths start to become less and less frequent as you get further from the pump.

So you can tell at a glance that something toxic is coming out of this pump.

So, with the help of this map, and the further evangelization he and Whitehead did over the next few years, the authorities finally really started to move slowly.

This story took much longer than we thought, but by 1866, when the next major cholera epidemic came to London, the authorities were convinced, partly because of this story, partly thanks to this map, that water was indeed the problem.

And they had already started building sewers in London, and they immediately turned to this fad and told everyone to start boiling water.

It was the last cholera outbreak in London since then.

So part of this story, I think, is a terrifying story, a very dark story, a story that goes on in a lot of developing cities around the world.

This is also a fundamentally optimistic story. So if you listen to reason, listen to the wisdom of this kind of map, listen to people like Snow and Whitehead, listen to locals who understand what's going on in this kind of situation, it's possible to solve these problems.

And what it ultimately achieved was making the idea of ​​living in a big city sustainable.

When people were watching 10 percent of their neighborhood die in 7 days, there was a broad consensus that this couldn't go on and people shouldn't live in a city of 2.5 million people.

But thanks to Snow's actions, thanks to this map, thanks to the series of reforms that have taken place as a result of this map's influence, we now take for granted 10 million people in cities, and cities like these are actually sustainable.

We are not afraid that New York City will collapse like Rome and become 10 percent of its size in 100 or 200 years.

And that is, in some ways, the ultimate legacy of this map.

It was a map of death that ultimately led to the birth of a whole new way of life—the life we ​​enjoy here today. thank you very much.

An old saying goes, "Just because you can't see something doesn't mean it's not there."

My work is a reflection of myself.

What I wanted to do was show the world that small things can be big things.

We all seem to look down on the ground and think there is nothing there.

And we use the word "nothing".

There is nothing that does not exist, because there is always something.

When I was a child, my mother told me to always respect the little things.

What made me do this job? get into my story.

This all started when I was 5 years old.

what made me do that? At school, I admit this, but academically I couldn't express myself.

So I was more or less categorized as "nothing".

My world seemed small.

So I decided that I never wanted to be involved in that world.

I thought I needed to back off on something else.

So when my mother took me to school, I thought I was at school, and when she turned away, I made a U-turn and ran away, hiding in a closet in the back garden.

One time, when I was in the hut, my mother thought I was at school and suspected something.

My mother was like the woman in Tom and Jerry.

So just look at her legs.

(Laughter) So I was hiding in the hut like that.

And suddenly...

And then I saw her legs.

Then she said--she grabbed me like that because she was so big--and picked me up and said, "Why don't you go to school?"

I told her that I can't face it because my teacher treats me, ridicules me and treats me as a failure example.

So I said to her

At that age, of course I couldn't put it that way, but I told her I wasn't feeling well.

And she just said, "You're going to school tomorrow, aren't you?"

and left. And I was expecting one of these, so I wasn't expecting that...

But I didn't understand.

So I'm sitting there thinking.

And when I looked down on the ground, I noticed a few ants running around.

And I entered this little fantasy world.

And I thought, "Are these ants looking for a queen?"

Or do you need a place to live? ”

So I thought, "Maybe if I build an apartment for these ants, they might move out."

(Laughter) So I did.

And how did it start, I got some wood shards.

Then I sliced ​​up a small piece of wood with a shard of broken glass and built this little apartment.

When completed, it looked like a small shack.

But I thought maybe the ants wouldn't know and would invade.

And they did.

At the time, it was kind of sketchy. And I made a little apartment, a little merry-go-round, a seesaw, a swing, a little ladder, and all that.

Then I put sugar or something to encourage the ants to come closer.

And when I sat down, all the ants came.

And all I could hear was, "Is this for us?"

(Laughter.) And I say, "Yes, they are all yours."

And they moved out and decided not to pay me rent.

(Laughter) And from there I was looking at this little world.

It became a part of me.

When I realized I had this talent, I wanted to explore the world that we cannot see.

It made me realize that life is not just about all the gigantic things that surround us.

So I started studying this molecular level.

And as I got older, I kept going. I showed it to my mother.

Mother told me to make it smaller.

Well, let me show you something here.

and explain.

As you can see, it's a pinhead.

(Laughter) (Applause) It's called the Huff House now.

It was a gentleman named Peter Huff who asked me to do this.

And he said to me, 'Willard, can you put my house on a pinhead?

(Laughter) So I say, "How are you going to fit in there?"

(Laughter) And he said to me, "I don't think you can do it. Can you?"

And I say, "Well, try me."

and he said: "But I don't think you can do that." So I said, "Okay."

So, long story short, I went home and went under the microscope and smashed the shards of glass to pieces.

And there was a shard of glass under the microscope.

Some of them were quite jagged.

So I was smashing these glass pieces. As you can see, that's the actual frame of the house.

And the actual roof is made of fabric, which I found from my sister's old teddy bear.

(Laughter) So I got a teddy bear and said, "Can I pull a piece of fiber out of it?"

So I did.

And then I looked at it under a microscope. And some of it was flat.

Therefore, I decided to slice them using a tool that I made, sharpening the tip of a needle.

And it actually slows down the entire nervous system.

And it takes 1.5 seconds to work and actually move between heartbeats.

And at the same time, you have to be careful not to inhale your work.

(Laughter) (Applause) Because that's what happened to me.

(Laughter.) So what I did is, like I said, back to the glass.

I found this little piece of glass.

And I had to square them.

So we ask, "How can we do this?"

So what did I do, I got an oilstone. I broke the edge of an oil stone.

And what I did was get a shard of glass. And I started rubbing them.

I used small tweezers made from hair clips.

And I attached a rubber to the tip of the tweezers so as not to crush the glass.

Then, very, very gently, I started rubbing until some of the edges were perfectly square. and built it.

And how we constructed it is by making a groove in the top of the pin head.

And the friction of the glass itself pushes the glass.

What happened in the meantime?

The instrument I used turned into a catapult.

And it went like this...

And that was it.

(Laughter) Gone.

So I think this way. "I don't think Mr. Huff will be very happy if I tell him that his home has gone to another place, somewhere in the atmosphere."

So long story short, I decided I had to go back and do it.

So I found some more. And I decided to build very slowly, holding my breath, working between heart beats, making sure everything was level.

It's a very small sculpture, so there's nothing wrong with that.

And I decided to build it up.

Then I used the fibers of the jumper to hold and stretch it.

And built beams around the house.

And the actual windows and balconies had to be built somehow.

I actually used the money spider's web to attach certain things, which almost drove me crazy.

But I managed.

And when it was over, I came back the next day.

I found the house inhabited.

Ever heard of dust mites?

Darren Dani and his family have moved.

(Laughter) So basically the house is done.

And there you are.

(Applause) (Laughter) Yes. As you can see, Bart Simpson has a bit of an altercation.

I think they are arguing about pin spacing.

Not enough space for two people.

So I didn't expect him to kick Bart out.

I think he actually just warned.

But this one was made from a nylon tag on my shirt.

What I did was pull the tag out and put it under the microscope.

I used a needle with a small blade on the tip.

Can anyone see the blade at the end of that needle?

Audience: No.

WW: So what I did was the same process, holding my breath and working very slowly, manipulating and cutting the plastic. Because the plastic behaves differently.

Things behave differently when you work at that level.

Because it is at the molecular level, things change and behave differently.

And sometimes they turn into little catapults and things go up into the air.

And, you know, different things happen.

However, I had to build a small barrier around it with cellophane to stop its movement.

Then static electricity is generated.

And it went...

and trying to get rid of it. And static electricity interferes with everything.

Sweat drips down my head. Because you have to carve Homer Simpson in that position.

And after cutting out the shape you need to make sure there is room for the neck of the bart.

After doing the same, it should be painted.

And after you actually sculpt, you have to paint.

I experimented and found a dead fly.

And I plucked the hair from the fly's head.

I decided to make a paintbrush.

(Laughter) But I would never do that to a live fly.

(Laughter) Because I've heard flies suffer.

And they shout "Meow! Wow!"

I never kill insects, even if they upset our nerves. Because "all living things, big or small" -- there is a hymn that says so.

So I decided to pluck out the fine hair on my face.

And then I looked at it under a microscope.

It was the paintbrush.

You have to be very careful while painting as the paint will start to clump together.

And it begins to dry very quickly.

So it has to be done very quickly.

If you don't, you'll end up with something that isn't what it should be.

It could look like Humpty Dumpty or someone else.

So I have to be very careful.

I think this took about 6-7 weeks.

A rough estimate of my work can take 5, 6, 7 weeks. Not always predictable.

(Applause) As you can see, it's a smaller version of Charlton Heston.

(Laughter.) He says to me, 'Willard' -- I see him saying, 'Why me?'

I say, "I enjoyed your movie, so."

As you can see, there are aphids.

This is to show the scale and actual size of the engraving.

I think it probably measures...

quarter millimeter.

In America, it's called cessation of menstruation.

For example, a half stop, or complete stop, is about the same size as the whole.

It's made - tanks are made of gold.

Charlton Heston is made of suspended fibers taken from the air.

When sunlight shines through a window, you can see these tiny fibers.

And what I always do is walk around the room -- (laughter) -- trying to find the room. and put it under the microscope.

I remember the window was open when I was doing it one time.

A woman was standing by the bus stop.

And she saw me walking around like this.

(laughter) And she looked at me.

and i went...

And she said, "Well, okay, he's not mad."

Yes, to actually do this, real tanks are made of gold.

I was wearing a 24K gold ring.

And I cut off a few gold flakes.

And I bent it in a circle and put it inside the tank.

And horses are made of nylon.

And the spider's web is the reins of the horse.

It was very difficult to give the horse a symmetrical shape. I needed to make the horse stand up and make it look like it was doing some kind of movement.

When I did this, a gentleman saw it and said to me, "You can't do that, you must have used some kind of machine.

A man cannot do that.

It must be a machine. ”

So I said, "Well, if you say it's a machine..."

(Laughter) (Applause) It took about six weeks.

(Applause.) The most famous statue in the world.

I would say this was quite a challenge.

(Laughter) Because I had to put the torch on.

It's more or less the same kind of process.

I wanted to give it a bit of a stone feel, so the bottom is carved out of grains of sand.

I actually carved the actual base using tiny diamond shards.

Well, I can see this statue and I am very proud of it. Because this statue has always stuck in my mind the image of when people first came to America.

So it's like Ellis Island, like seeing America for the first time.

And that was the first thing they saw.

So I wanted to have that little image.

And this is it.

(Laughter.) And we all know it's the Hulk.

I wanted to create movement in the eye of the needle.

Because we know we see a needle, but we don't know much about the eye of the needle, except for threading the needle.

That's how I broke the needle.

And made the needle look like Hulk broke it.

It was—I had to make a small hole at the base of the needle to push his foot in.

So I don't use glue in most of my works.

They carry on with their own friction.

And that's how I was able to do it.

As you can see, he's looking at this moment right now. He has a little frown on his face.

And his mouth must probably be about 3 microns.

So the eye is probably 1 micron or so.

The ships there are made of 24-karat gold.

And I usually set up money spider webs.

But I had to fix it with glue.

The spider web was driving me crazy because I couldn't get rid of the web.

And it's 24K gold. And it is built. I built

Each plate was made of gold.

And the whole thing is kind of symmetrical.

The flag had to be made from small gold wads.

It's like doing surgery to get this right.

(Applause) As you can see, it's dressage.

(Laughter) I just wanted to show you how you can get symmetrical shapes.

Real horse reins are made of similar materials.

And it was done with particles from my shirt.

And the pinheads around it were made green by scraping particles off the green shirt and pressing them onto the needle.

It's a lot of painstaking work, but the best comes in a small package.

(laughs) Bruno Giussani: Willard Wigan!

(applause)

In 1165, copies of the strange letter began to circulate throughout Western Europe.

It tells of a fantastical realm, including the Tower of Babel and the Fountain of Youth, all ruled by Prester John, author of the mystery of the Letters.

Today we know that this extraordinary king never existed.

But the legend of this mythical kingdom and its powerful ruler will influence the decisions of European leaders for the next 400 years.

The myth of Prester John propelled the Age of Discovery, fueled intercontinental diplomacy, and indirectly sparked civil war.

Europe was on a crusade when Prester John's letters appeared.

In this series of religious wars, Europeans campaigned to occupy what they considered sacred sites for Christianity.

The church denigrated all non-Christian faiths, including the Jewish and Muslim communities living in the area.

The Crusaders were eager to find Christian kingdoms as allies in the war.

And they were particularly interested in rumors of a powerful Christian king who defeated a huge Muslim army in the Far East.

In fact, it was hordes of Mongols, including converted Christian tribes, who routed the army.

However, the news of this victory did not reach reliably.

Merchants and messengers filled the gaps in the story with epics and fragments of the Bible.

By the time the story reached Europe, the Mongol hordes had been replaced by a large Christian army commanded by a king who shared the crusader's vision of marching on Jerusalem.

And when a letter allegedly written by this so-called "Prester John" appeared, European rulers were thrilled.

The actual authorship of this letter remains unknown, but its alignment with Eastern stereotypes and European goals points to it as a Western fabrication.

But despite the evident European propaganda origins of the letter, Prester John's mythical appeal was too great for the Crusaders to ignore.

In time, European cartographers began to speculate on the location of his mythical kingdom.

During the 13th and 14th centuries, European missionaries headed east along the newly revived Silk Road.

They weren't looking for the author of the letter, who must have been over 100 years old. rather for his descendants.

Although the title of Prester John was temporarily identified with a few Central Asian rulers, it soon became apparent that most of the Mongols were non-Christians.

And as the empire began to decline, Europeans sought alternative routes to the Far East and new clues to Prester John's whereabouts.

As these explorers headed south, Ethiopian pilgrims began their journey north.

In Rome, these visitors quickly attracted the interest of European scholars and cartographers.

Ethiopia converted to Christianity in the 4th century, so the story of the African Motherland fits perfectly into the legend of Prester John.

Portuguese explorers scoured Africa for a kingdom, but a mix of confusion and diplomacy finally made the myth come true.

The Ethiopians graciously received European guests eager to make a deal with a ruler they believed to be Prester John.

The Ethiopians were at first puzzled by the Portuguese' unusual name for their emperor, but they were savvy enough to recognize the diplomatic capital the Portuguese had given them.

Ethiopian diplomats played the role of subjects of Prester John, and the Portuguese triumphantly announced an alliance with the fabled monarch, more than 350 years after European letters began their search.

However, this long-awaited partnership was quickly put to the test.

Ten years later, the Ottoman-backed regional power Adar Sultanate invaded Ethiopia.

The Portuguese sent troops to help the Ethiopians win the conflict.

At this point, however, it was clear that Ethiopia was not the strong ally that Europe expected.

To make matters worse, the increasingly intolerant Roman Catholic Church began to view Ethiopian Christian sects as heretical.

Subsequent attempts to convert people once revered as ideal Christians eventually sparked a civil war, and in the 1630s Ethiopia severed its ties with Europe.

Over the next two centuries, the legend of Prester John slowly faded into oblivion, ending the reign of a king who never existed but made history.

Good morning everybody.

I would like to talk about a few things today.

First is water.

It looks like you've been enjoying the water we've been offered here at the conference for the past few days.

And you'll know it's from a safe source.

But what if it wasn't?

What if it came from a source like this?

Then statistics show that half of you are actually suffering from diarrhea.

I've talked a lot in the past about statistics and providing safe drinking water for all.

But they don't seem to get along.

And I think I know why.

That's because the problem seems too big to think of a solution in the current way of thinking.

So just switch off us, governments and aid agencies.

Well, today I want to show you how thinking differently solved the problem.

By the way, since I spoke there are now 13,000 more people suffering from diarrhea around the world.

And four children have just died.

I got pissed off, so I invented a life saver bottle.

The day after Christmas 2004, I was sitting like you watching the devastating news of the Asian tsunami on TV.

In the days and weeks that followed, people were forced to flee to the hills and face death if they did not drink the contaminated water.

It really stuck in my mind.

A few months later, Hurricane Katrina hit the mainland United States.

"Okay, this is a first world country, let's see what we can do," I thought.

Day 1: Nothing.

Day 2: Nothing.

Did you know it took five days to get water to the Superdome?

People were shooting in the streets for TVs and water.

That's when I decided something had to be done.

Well, over the next few weeks and months, I spent a lot of time in my garage and also in my kitchen, much to my wife's disappointment. (Laughter) But after a few failed prototypes, I finally came up with this life saver bottle.

Now, let's talk about science.

Before Lifesaver, the best hand filters could only filter down to about 200 nanometers.

The smallest bacteria are about 200 nanometers.

So a 200nm bacterium will pass through a 200nm hole.

The smallest viruses, on the other hand, are about 25 nanometers.

That means it will definitely pass through a 200-nanometer hole.

Lifesaver pores are 15 nanometers.

So nothing is communicated.

Well, let's do a little demonstration.

do you want to see it?

I spent so much time setting this up that I think it should.

We are in the wonderful city of Oxford.

I mean, somebody made it.

Oxford is a wonderful city. So what I did was I went to draw water from the Cherwell and Thames that flow through here. And this is water.

But I started thinking that if we were in the middle of a flood zone in Bangladesh, the water wouldn't be like this.

So I brought some things to add to it.

And this is from my pond.

(Sniffling) (Coughing) Smell it, cameraman.

have understood. (laughs) Right.

just pour it in there.

Audience: Wow!

Michael Pritchard: Okay. There is runoff water from a sewage treatment plant farm.

So just put it in there.

(Laughter) Put that in there. Let's go.

(Laughter) Throw the other pieces in there as well.

And I got a present from my friend rabbit.

So put that in there too.

(Laughter) Okay. (laughs) Okay.

How the Life Saver Bottle works is really simple.

Just scoop up the water.

Today I'm going to use a jug to show you guys. Let's put a little bit of that poop in there.

It's not dirty enough. Let's stir it up a bit.

Now, let's get this really dirty water in here. Would you like a drink yet?

(Laughter) Okay. Let's go.

Replace the top.

Press the pump several times. have understood?

That's all you need.

Sterile drinking water comes out as soon as you twist the nipple.

We must hurry. yes, are you ready?

Let's go. Be careful with electricity.

It is safe and sterile drinking water.

(Applause.) Cheers.

(Applause) Yes, Chris.

(Applause.) What does it taste like?

Chris Anderson: It's delicious.

Michael Pritchard: Okay.

Take a look at Chris' program throughout the rest of the show. have understood?

(Laughter) Okay. Lifesaver bottles are used by thousands of people around the world.

6,000 liters can also be used.

When it expires, it uses fail-safe technology to stop the system and protect you.

Take out the cartridge. Plug in a new one.

Another 6,000 liters is fine.

Now let's look at the application.

Traditionally, what should we do in times of crisis?

We are shipping water.

A few weeks later we set up camp.

And people are forced into camps to get safe drinking water.

What happens when 20,000 people gather at the camp?

disease spreads. Need more resources.

The problem only persists.

But by thinking differently and shipping these, people can stay there.

They can make their own sterile drinking water and start working on rebuilding their homes and lives.

Now, you don't need a natural disaster for this to work.

Using old ideas like national infrastructure and plumbing is too expensive.

If you calculate the number with a calculator, it will be zero.

Here's a "different way of thinking".

Instead of transporting water or using artificial processes, take advantage of Mother Nature. She has a great system.

She pumps water from it, desalinates it for free, carries it there and dumps it into mountains, rivers and streams.

and where do people live? near water.

All you have to do is sterilize it. How do we do that?

Well, you can use a life saver bottle.

Alternatively you can use any of these.

The same technology in a jerry can.

It can handle 25,000 liters of water. A family of four can use it for three years.

How much does it cost?

Running costs about 0.5 cents a day.

thank you.

(Applause.) So by changing our mindset and treating water as we use it, mothers and children no longer have to walk four hours each day to fetch water.

Available from nearby sources.

For just $8 billion, we can meet the Millennium Goal of halving the number of people without access to safe drinking water.

To put this in context, the UK government spends around £12 billion a year on foreign aid.

But why stop there?

With $20 billion, everyone can have access to safe drinking water.

As a result, the 3.5 billion people who suffer each year and the 2 million children who die each year will survive.

thank you.

(applause)

In January 1953, a storm surge shook the North Sea.

About 2,000 people died as giant waves flooded the Dutch coastline.

Fifty-four years later, a similar storm threatened the region.

But this time, the Netherlands were ready.

As the water expanded, state-of-the-art computer sensors triggered emergency protocols.

Over the next 30 minutes, a 240-meter long steel arm pivoted shut to protect the channel ahead.

Using 680-ton ball joints, the barrier moved with changes in wind and waves.

By morning the storm had passed and flooding was minimal.

Maeslantkering's first field trip was a huge success.

One of the largest moving structures on earth, this storm surge barrier is a marvel of ergonomics.

But Maeslankeling is just one part of the world's most sophisticated flood control project, a large, interlocking flood control system known as Deltaworks.

The Netherlands has a long history of water management.

The country lies along the deltas of Europe's three major rivers, with almost a quarter of the country lying below sea level.

This topography makes the area highly prone to flooding.

Some of the earliest governing bodies in the Netherlands even had an informal 'Water Commission' to coordinate flood control projects.

However, after the storm of 1953, the Dutch government took more formal action.

They set up the Delta Commission and gave it the task of defending the entire Southwest.

Focusing on densely populated cities, their goal is to reduce the annual probability of flooding to less than 1 in 10,000, which is about 100 times safer than the average coastal city.

Achieving this lofty goal required a variety of infrastructure projects along the southwest coast.

The first line of defense was to dam the flood-prone estuaries of the area.

These large inlets fed many of the country's rivers into the North Sea, causing floods to surge inland during storms.

The Delta Commission has used a series of dams to transform these estuaries into vast lakes that serve as nature reserves and community parks.

However, this solution does not work for Newe Waterweg.

A lifeline for the local shipping industry, this corridor had to be left open under safe conditions and barricaded during high tides.

Completed in 1998, the Maes Rankeling provided the flexible protection needed.

Alongside additional barriers such as overgrown embankments and concrete seawalls, these fortifications were a large part of the Delta Mill project and were primarily focused on staving off sea storms.

But in the decades that followed, the Netherlands pursued additional plans to complement the Delta plant and protect it from flooding further inland.

Farms and embankments were moved away from the coast under the "River Room" scheme.

This created more space for water to collect in the low-lying floodplains, creating reservoirs and habitats for local wildlife.

This strategic setback not only reduced the risk of flooding, but also allowed redeveloped settlements to be built more densely and sustainably.

Perhaps no city exemplifies the Dutch multi-faceted approach to water management better than the prosperous city of Rotterdam, which lies almost below sea level.

When threatened by storms, old densely populated neighborhoods are protected by traditional dikes.

New districts, on the other hand, are often artificially raised and have green roofs to store rainwater.

Many structures in the city are transformed into water reservoirs, including parking lots and plazas that usually serve as theaters and sports arenas.

On the other hand, in the harbor, the floating pavilion rises to match the water surface.

These are the first of several planned amphibious structures, some of which will include water purification systems and solar thermal collectors.

These strategies are just some of the technologies and policies that have pushed the Netherlands to the forefront of water management.

The country continues to explore new ways to make cities more resilient to natural disasters.

And as rising sea levels due to climate change threaten low-lying cities around the world, the Netherlands is an exceptional example of how to deal with the tide.

4,300 years ago in ancient Sumer, the most powerful people in the city of Ur were banished to wander the vast desert.

Her name is Enheduanna.

She was the High Priestess of the Moon God and the first known writer in history.

By the time she went into exile, she had written 42 hymns and 3 epics, but the Sumerians had not heard her last verse.

Enheduanna lived 1,700 years before Sappho, 1,500 years before Homer, and about 500 years before the biblical patriarch Abraham.

She was born in Mesopotamia, between the Tigris and Euphrates rivers, the first city and cradle of high culture.

Her father was Sargon the Great, the first empire-builder in history, who conquered the independent city-states of Mesopotamia under a unified banner.

Sargon was an Akkadian-speaking Cicada of the north, and the old Sumerian cities of the south regarded him as a foreign invader.

They rebelled frequently to regain their independence, and his new dynasty fell.

To bridge the cultural gap, Sargon appointed his only daughter, Enheduanna, as a high-ranking lady in the empire's most important temple.

Female royals traditionally played a religious role and were educated to read and write in both Sumerian and Akkadian and to be able to do mathematical calculations.

The world's first writing began in Sumer as an accounting system, allowing merchants to communicate over long distances with merchants abroad.

Their record-keeping pictographic system evolved into writing about 300 years before Enheduanna was born.

Called cuneiform, this early typeface was written by pressing a reed stylus into soft clay to create wedge-shaped marks.

Until Enheduanna, however, this writing was primarily a form of record keeping and transcription rather than original works attributed to individual authors.

Ur of Enheduanna was a city of 34,000 inhabitants, with narrow streets, multi-storey brick houses, granaries, and irrigation facilities.

As High Priest, Enheduanna managed the city's grain storehouses, oversaw hundreds of temple workers, interpreted sacred dreams, and presided over the monthly New Moon and equinox ceremonies.

Enheduanna set out to integrate the old Sumerian culture with the new Akkadian civilization.

To accomplish this, she wrote 42 religious hymns that combined both mythologies.

Each Mesopotamian city was ruled by a patron deity, so her hymns were dedicated to the ruling deity of each major city.

She admired the city's temples, extolled the attributes of the gods, and explained their relationship to other gods within the pantheon.

In her writings, she humanized the once aloof gods, who now suffer, fight, love, and respond to human pleas.

Enheduanna's most valuable literary contribution was the poem she wrote to Inanna, the goddess of war and lust, the divine and chaotic energy that gives sparks to the universe.

Inanna delights in all forms of sexual expression and was considered powerful enough to transcend gender boundaries, along with her earthly servants who were prostitutes, eunuchs and cross-dressers.

Enheduanna placed Inanna at the top of the pantheon as the most powerful god.

Her ode to Inanna features the writer writing for the first time using the pronoun "I" and for the first time writing to explore deeply personal feelings.

After the death of Enheduanna's father, King Sargon, a general took advantage of the power vacuum to stage a coup.

As an influential member of the ruling family, Enheduanna became a target, and the general banished her from Ur.

Her nephew, the legendary Sumerian king Naram-Sin, eventually put down the rebellion and restored his aunt as high priest.

Enheduanna served as high priest for a total of 40 years.

After her death, she became a diminutive god and her poems were copied, studied and performed throughout the empire for over 500 years.

Her poetry inspired the Hebrew Old Testament, Homeric epics, and Christian hymns.

Today, Enheduanna's legacy remains on clay tablets that have stood the test of time.

If there is anything that is hidden from us, at least in modern culture, it will be revealed that we have forgotten, that we formerly knew, just as we knew our own names.

It means that we live in a capable universe, that we are part of a glorious planet, that we are surrounded by geniuses.

Biomimicry is a new field looking to learn from these geniuses and take their advice and design advice.

It's where I live and it's also my university.

I have geniuses around me. We cannot help but be reminded of the organisms and ecosystems that know how to live gracefully on this planet.

This is what I want to say if you forget again, please remember.

Remember this.

This is what happens every year.

This is keeping your promises.

This happened while we were doing the bailout.

spring.

Imagine designing spring.

Imagine that orchestration.

You find it difficult to organize TED. (laughs) Right?

Please try to imagine. If you haven't done this in a while, do it.

Imagine timing and coordination without top-down laws, policies and climate change protocols.

This happens every year.

There are many things to see.

There is so much love in the air.

There are many grand openings.

And the organism promises to have all priorities in order.

My neighbors are always contacting me about this. Because he always lies on his back and looks up at the grass.

And one time he came to me, he was about seven or eight years old. he came to me

And there was a wasp nest I grew in the garden right outside the door.

And most people hit it off when they're little.

But for me it was very interesting because I was looking at this kind of great Italian cover story.

And he came to me and knocked.

Every day he brought something to show me.

And knock on the door like a woodpecker until I open it.

And he asked me how I made a house for the bee. Because I've never seen a bee this big before.

And I said to him, "You know, Cody, the hornet actually built it."

And we saw it together.

And I know why he thought so, you know, it was so beautifully done.

It was very architectural. It was very accurate.

But I thought, how in his little life did he already believe the myth that if something is so well done, we must have done it?

What we all forget is that we weren't the first to build it.

We are not the first to process cellulose.

We are not the first to make paper. We are not the first to tackle packaging space optimization, waterproofing, or heating and cooling structures.

We are not the first to build homes for young people.

What's happening right now in this field called biomimicry is that people are starting to remember that living things, other living things, and the rest of the natural world are doing things that are very similar to what we're supposed to be doing.

But in reality, they do them in a way that allows them to live gracefully on this planet for billions of years.

So these people, the biomimics, are nature's apprentices.

And they focus on functionality.

What I want to do is show you some of the things they are learning.

They ask themselves, "What if every time I started inventing something, I asked myself, 'How will nature solve this?'" And this is what they are learning.

This is a great photo taken by a Czech photographer named Jack Hedley.

This is the story of a JR West engineer.

They are the ones who build the Shinkansen.

It was called Shinkansen because it has a round front, but it creates a pressure wave every time it enters a tunnel, and a sonic boom-like sound when it exits.

So the engineer's boss said, "Find a way to make this train quieter."

He happened to be a bird watcher.

He attended the equivalent of a meeting of the Audubon Society.

And he studied - there was a film about kingfishers.

And he thought, "They go from one density medium, air, to another density medium, water, without a splash. Look at this picture.

Because there is no splash, you can see the fish clearly.

And he thought, "What if I do this?"

I made the train quiet.

10% faster with 15% less power.

How does nature fight off bacteria?

We are not the first to have to protect ourselves from certain types of germs.

After all, this is a Galapagos shark.

There are no bacteria, dirt or barnacles on the surface.

Not because it goes fast.

actually sunbathe. A slow-moving shark.

So how do you keep bacteria from accumulating in your body?

It's not something you do with chemicals.

It turns out that it was made with the same dentition as the Speedo swimsuit that broke all the records at the Olympics, but this is a special pattern.

And that pattern, the tooth-like pattern structure of that skin, prevents bacteria from landing and attaching.

A company called Sharklet Technologies puts them on surfaces in hospitals to keep out germs. This is more effective than flooding hospitals with antibacterial agents and harsh cleansers, where so many microbes have developed drug resistance.

In the United States, hospital-acquired infections now kill more people each year than AIDS, cancer, and car crashes combined—about 100,000.

This is a small creature that lives in the Namibian desert.

There is no fresh water to drink, but I drink the water in the fog.

There is unevenness on the back side of the wing cover.

And those ridges act like magnets for water.

The tip prefers water and the sides are waxy.

And the fog comes in and accumulates at the tip.

And it enters the creature's mouth through the side.

There's actually a scientist here at Oxford, Andrew Parker, who has done this.

And now kinetic and architectural firms like Grimshaw are starting to look at this as a way to coat buildings to collect water from fog.

10x better than our fog net.

CO2 as a constituent.

Living organisms do not consider CO2 to be poisonous.

The plants and organisms that make up shells and corals think of it as a building block.

Today, there is an American cement manufacturing company called Carrera.

They borrow recipes from coral reefs and use CO2 as a building block in cement and concrete.

Instead -- cement typically emits 1 tonne of CO2 for every tonne of cement.

Now that equation has been reversed, and half a tonne of CO2 is actually sequestered thanks to a recipe from coral.

None of these use living organisms.

They really only use blueprints or recipes from creatures.

How does nature collect the sun's energy?

This is a new type of solar cell that applies the structure of leaves.

It is self-assembled.

It can be applied to any substrate.

Very cheap and rechargeable every 5 years.

This is actually a company called OneSun that Paul Hawken and I are involved with.

There are many ways in nature to filter water and remove salt from it.

Remove the water and press it onto the membrane.

And wonder why the membrane clogs and why it takes so much power.

Nature does something more elegant.

And it's in every cell.

Every red blood cell in your body now has hourglass-shaped pores called aquaporins.

They actually transport water molecules.

It's a kind of order penetration.

They carry away water molecules and leave solutes on the other side.

A company called Aquaporin has begun manufacturing desalination membranes that mimic this technology.

Trees and bones are constantly self-forming along stress lines.

This algorithm has been incorporated into software programs and is now used to lighten beams in bridges and buildings.

In fact, G.M. Opel used it to create the skeleton of a so-called bionic car.

For maximum strength, the skeleton has been lightened using the minimum amount of material required by the organism.

This beetle, unlike the chip bag here, this beetle uses one material, chitin.

And you'll find many ways to incorporate many features.

Waterproof.

Strong and resilient.

Good ventilation. It creates color through structure.

Chip bags, on the other hand, have about seven layers to do all these things.

One of the major inventions we need to make to get even closer to the capabilities of these creatures is finding ways to minimize the amount and type of materials we use and add design to it.

We use five naturally occurring polymers to do everything you see.

Around 350 different polymers are used in our world to make all of this.

Nature is nano.

Nanotechnology, nanoparticles, we hear a lot of worries about this.

loose nanoparticles. What's really interesting to me is that there aren't that many people asking, "How can we naturally consult on how to make nanotechnology safe?"

Nature has done so for a long time.

For example, always embed nanoparticles in materials.

In fact, sulfur-reducing bacteria release nanoparticles into water as a by-product as part of their synthesis.

But shortly after, they release a protein that actually collects and clumps the nanoparticles, causing them to fall out of solution.

use of energy. Organisms take in energy. Because you have to work and barter for every bit you can get.

And in one of the biggest areas today, the world of energy grids, we hear a lot about smart grids.

One of the biggest consultants is Social Insects.

swarm technology. There is a company called Regen.

They are looking at how ants and bees find food and flowers in the most efficient way for the entire hive.

The appliances in your home then communicate with each other through its algorithms to determine how to minimize peak power usage.

A group of scientists at Cornell University are creating what they call synthetic trees. Because they say, "There is no pump at the base of the tree."

Water is pulled up drop by drop by capillary action and transpiration, released from the leaves, and pulled up from the roots.

And they can think of it as a kind of wallpaper.

They are considering installing it inside a building to draw water without using a pump.

Amazon electric eels (some of these species are incredibly endangered) generate 600 volts of electricity with chemicals in their bodies.

What's even more interesting to me is that 600 volts won't fry.

As you know we use PVC and we wrap the wires in PVC for insulation.

How do these organisms insulate against their own charge?

These are some questions we haven't asked yet.

Here is a wind turbine manufacturer that went whale.

Humpback whale flippers have wavy edges.

And the corrugated edges take advantage of the flow, reducing drag by 32%.

As a result, these wind turbines can rotate even at incredibly slow wind speeds.

MIT has developed a new radio chip that consumes far less power than ours.

It is based on the cochlea of ​​the ear and can receive internet, wireless, TV signals and radio signals within the same chip.

Finally, let's talk about the ecosystem scale.

At my consulting firm, Biomimicry Guild, I work with HOK Architects.

We are looking at building an entire city in our planning department.

And what we're saying is, shouldn't our cities be at least as good in terms of ecosystem services as the original systems they replace?

So we're creating what we call 'Ecological Performance Standards' to keep cities up to this higher standard.

The problem is that biomimicry is an incredibly powerful method for innovation.

What I want to ask is, "What's worth solving?"

If you haven't seen this before, it's pretty amazing.

Dr. Adam Niemann.

This is a picture of all the water, all the ice, all the fresh water, all the sea water, and all the atmosphere we can breathe on Earth compared to the volume of the Earth.

And within those spheres, over 3.8 billion years of life have created a lush, livable place for us.

And we are in a long, long line of life that comes to this planet and asks, "How can we live gracefully here for a long time?"

How can we do what we have learned in life?

It is to create an environment that is easy to sustain life.

In order to realize this, which is the design challenge of this century, I think we need a way to remember those geniuses and reconnect with them in some way.

One of the big ideas, big projects that I'm honored to work on is a new website. And I highly recommend everyone to go.

It's called AskNature.org.

And what we're trying to do is organize all the biological information by design and engineering function in the TEDesque way.

And we're working with EOL, Encyclopedia of Life, and Ed Wilson's TED wishes.

And he collects all biological information on one website.

And scientists contributing to EOL are answering the question, "What can we learn from this organism?"

The information is then sent to AskNature.org.

And hopefully, any inventor, anywhere in the world, will be able to input, at the moment of creation, "How does nature remove salt from water?"

And then come mangroves, sea turtles, and your own kidneys.

And then we'll be able to act like Cody and get in touch with these incredible models, these elders, who've actually been here a lot longer than we have.

And hopefully, with their help, we can learn how to live on this earth and in this home that is ours but not ours alone.

thank you very much.

(applause)

I just want to say my name is Emmanuel Jal.

And I'm from far away

I have told stories that have been very painful to me.

Traveling around the world and telling my story in book form has been a daunting journey for me.

And tell it like now.

Also, the easiest time was when I was doing it as music.

So I branded myself a child of war.

I am doing this because there is an old woman in my village who has lost her children.

No newspaper reports on her pain and what she wants to change in this society.

And I'm doing this for young men who want to make a difference but have no way of expressing their voice because they can't write.

Or Facebook, MySpace, YouTube, etc. There is no Internet for them to speak.

Also, the other thing that kept me pushing this story, this painful story, the dreams I sometimes had were like the voices of the dead I saw, telling me, 'Don't give up, keep going.'

Because sometimes I stop and don't want to do it because I didn't know what I was focusing on.

I was born in the most difficult times when my country was at war.

I saw my village burn down.

I saw a world that meant so much to me disappear before my eyes.

When I was just five years old, I saw my aunt being raped.

My mother lost her life in the war.

My brothers and sisters were scattered.

And to this day, my father and I are estranged and still have issues with him.

Seeing people die every day and my mother crying, I feel like I was brought up in a violent environment.

And that's what led me to be called a child of war.

Not only that, I became a child soldier when I was eight years old.

I didn't know what the war was for.

But one thing I knew was that the image I saw stuck in my head.

When he goes to training camps, he says, "I want to kill as many Muslims and Arabs as possible."

The practice wasn't easy, but my motivation was to get revenge on my family.

I wanted to take revenge on the village.

Fortunately, things have changed now as I have come to discover the truth.

It was neither Muslims nor Arabs who were actually killing us.

It was someone sitting somewhere manipulating the system and using religion to get what they wanted from us: oil, diamonds, gold, land.

So, the realization of the truth left me with a choice: Should I continue to hate or let go of it?

So I happened to forgive him. Now I sing music with Muslims. I dance with them

He also released a movie called "War Child" funded by Muslims.

Then the pain disappeared.

But my story is huge.

So I'm going to take another step, which is easier for me.

I would like to introduce the poem "Forced to Sin" from my album "War Child".

i will tell my story

One of the trips I walked when I was tempted to eat my friends as there were no food and around 400 people.

And only 16 survived the journey.

So, I hope you will listen to this.

My dreams are like torment.

every moment of me.

The voices of my friends who were killed echo in my mind.

Friends like Rual, who starved to death by my side.

Scorching jungles and desert plains.

I was next, but Jesus heard my cry.

He comforted me when I was tempted to eat the rotten flesh of my companions.

We were raiding villages and stealing chickens, goats, sheep, whatever we could eat.

I knew it was rude, but I needed food.

Therefore, I was forced to sin, forced to sin to earn a living, forced to sin to earn a living.

Sometimes you have to lose in order to win.

never give up. never give up.

I left home at the age of 7.

A year later, live with your AK-47 by your side.

I was sleeping with one eye wide open.

Run, escape, play dead and hide.

I've seen my people die like flies.

But I never saw a corpse, or at least I never saw one that I killed.

But still wondering, I don't dive.

Gunshots howl like lightning and thunder.

I was a young and kind child, so I still remember the unforgettable words.

I saw the sergeant raise his hand. There was no retreat, no surrender.

I carry the banner of trauma.

A child of war, a child without a mother, still fighting in the story.

But as I wage this new war, I am not alone in this drama.

No need to sit or stop. Like a patriotic cop, I do my best to reach the top.

I keep fighting day and night.

Sometimes we do wrong things to make things right.

It's like dreaming.

I felt human for the first time.

ah! Children of Darfur.

Your empty belly on TV and now I'm fighting for you.

I left the house.

I don't even know when I'll be back.

My country is war-torn.

The music I was listening to was bombs and gunshots.

Too many people have died and I can't even cry anymore.

Ask God what am I here for?

And why are my people poor?

And why was I learning to fight while other children were learning to read and write?

They ate snails, vultures, rabbits, snakes, and anything else that had life.

I was ready to eat.

I know it's unfortunate. But who should be to blame?

That's my story shared in lesson form.

(Applause.) Thank you.

(Applause.) It's the music I do that energizes me and keeps me going.

I've never seen anyone talk to me and give me advice or therapy.

Music was therapy for me.

It's a place where, through dance and music, I can actually see heaven, where I can be happy, where I can go back to being a child.

So there's one thing I know about music. Music is the only thing that can enter your cellular system, your mind, your heart, affect your soul and mind, and even affect the way you live without you even realizing it.

Music is the only thing that makes me want to get up and shake my legs, even if I don't want to.

So I always compare the power of music to the power of love when love sees no color.

If you fall in love with a frog, that's it.

One of the proofs that I felt that music had power was when I was still a soldier.

I hated the people of the north.

But I don't understand why I don't dislike their music.

So we party and dance to their music.

And what struck me was that one day they brought in Arab musicians to entertain the soldiers.

And I nearly broke my leg while dancing to his music.

However, I had a question.

And now that I'm doing music, I know what the power of music is.

So what is going on here?

I have had a rough journey.

Today is the 233rd day of eating only dinner.

I don't eat breakfast No lunch.

And we did a campaign called Lose to Win.

Where you are losing to win the battle you are fighting now.

So I donate my breakfast and lunch to a charity that I set up because I want to build a school in Sudan.

And I'm doing this because in my house it's normal for people to eat one meal a day.

Here I am on the west side. I choose not to.

So now in my village, the children there, they usually listen to the BBC or the radio and are waiting to know that the day Emmanuel eats breakfast means he got the money to build our school.

So I made a promise. I said, "I don't eat breakfast."

I thought it would be funded within a month because it was famous enough, but I got really humbled.

(laughs) So it took 232 days.

And I said, "Don't stop until you find it."

As is done on Facebook and MySpace.

People are donating $3.

The lowest we ever got was 20 cents.

Someone donated 20 cents online.

I don't know how they did it.

(laughs) But it moved me.

So for me the importance of education is to die for it.

I am willing to die for this because I know what it will do to my people.

Education enlightens your brain and gives you plenty of chances so you can survive.

As a nation, we are in a crippled state.

Over the years, we have relied on aid.

I have a family of 20 and 30 years old in a refugee camp.

They only get food that falls from the sky, from the United Nations.

So these people, if you just give them help, you're going to kill an entire generation.

If anyone wants to help us, this is what we need.

Please provide the tools. Give the farmer tools.

It's rain. Africa is fertile. they can grow crops.

(Applause.) Invest in education.

Education to build powerful organizations capable of revolutionizing everything.

Because there are old people who are causing wars in Africa. they will die soon.

But investing in education can change Africa.

that's what i'm asking.

(Applause.) So that's why I established a charter called Gua Africa to get our kids in school.

And now we have a couple in college.

We have about 40 children, including former child soldiers, and people who want to cheer for us.

And I said, "I'll try that."

And with people who follow me and help me do something.

That's what I want to change, that's what I want to make a difference in the world.

Well, the time has come, so I would like to sing a song.

But I ask you to stand up to celebrate the life of Emma McCune, the British aid worker who made it possible for me to be here.

I sing this song to inspire you all to see how this woman made a difference.

She came to my country and learned the importance of education.

She said the only way to help Sudan is to invest in and educate its women and educate its children so that they can come and revolutionize this complex society.

So she ended up marrying an SPLA commander.

And she rescued over 150 child soldiers.

One of them just happens to be me now.

So at this moment, I would like to ask you to join us in celebrating Emma.

Are you all ready to celebrate Emma?

Audience: Yes!

Emmanuel Jal: Okay.

♫ This goes to Emma McCune ♫ ♫ One afternoon a rescue angel came ♫ ♫ I'm here because you saved me ♫ ♫ I'm proud to carry your legacy ♫ ♫ Thank you. take care. RIP. ♫ ♫ What will I become? myself! ♫ ♫ What would I be if Emma didn't help me? ♫ ♫ What will I become? myself! ♫ ♫ Another hungry refugee ♫ ♫ What will I become? ♫ ♫ What will I become? myself! ♫ ♫ What if Emma didn't help me? Yes! ♫ ♫ That's right! yes! ♫ ♫ You've seen my face on TV ♫ ♫ Hungry fat belly ♫ ♫ Flies in my eyes and my head is too big for my size ♫ ♫ Just a hungry little kid ♫ ♫ Running around in Africa, born wild ♫ ♫ Praise God, praise the Almighty ♫ Send me an angel to help me ♫ ♫ I have a reason to be on this earth ♫ ♫ Because I know the value of life better than most ♫ ♫ Now that I've had a chance to stand my ground ♫ ♫ Leap and run over mountains ♫ ♫ I'm not an angel, I hope to be one soon ♫ ♫ If I am, I want to be like Emma McCune ♫ ♫ It's me! what would i become? myself! ♫ ♫ What if Emma didn't help me? ♫ ♫ What would I become? ♫ ♫ What will I become? myself! ♫ ♫ Another hungry refugee ♫ ♫ What will I become? ♫ ♫ What will I become? myself! ♫ ♫ What if Emma didn't help me? Yes! Yes ♫ ♫ Yes, yes! ♫ ♫ I probably would have starved to death ♫ ♫ Or some other dreadful disease ♫ ♫ I grew up without an education ♫ ♫ I'm just a refugee ♫ ♫ I'm standing here because someone cared ♫ ♫ I'm standing here because someone gave me courage ♫ ♫ I know there's a lot of Emma out there ♫ ♫ Who's willing to save a child's life ♫ ♫ What will I become? myself! ♫ ♫ What if Emma didn't help me? ♫ ♫ What would I become? ♫ ♫ What will I become? ♫ ♫ I'm a starving refugee again ♫ ♫ I remember my childhood ♫ ♫ I remember when I was completely illiterate ♫ ♫ Now I'm all grown up and educated ♫ ♫ The sky has its limits and nothing can stop it ♫ ♫ How I prayed for this day ♫ ♫ ♫ And I pray that the world will find wisdom ♫ ♫ To help the poor in need ♫ ♫ Resistance Instead, yes ♫ ♫ I'm sitting and waiting for politics to settle ♫ ♫ It won't happen ♫ ♫ They're all sitting on their asses ♫ ♫ Sponging the masses out with champagne ♫ ♫ I'm from a refugee boy soldier ♫ ♫ But I still have my dignity ♫ ♫ I have to say it again Would have been ♫ Is there anyone here? Go back, love.

A big shout out to everyone at Emma.

yes! I'm going crazy.

♫ What will I become? ♫ ♫ What if Emma didn't help me? ♫ ♫ What would I become? ♫ ♫ Another hungry refugee ♫ ♫ What will I become? ♫ ♫ What if Emma hadn't helped me?

(Applause.) Go save a child's life.

(applause)

I have to make a confession here first.

A little over 20 years ago, I did something I regret and not particularly proud of.

In many ways, I don't want anyone to know, but I feel compelled to clarify here.

(Laughter) In the late 1980s, in a moment of youthful indiscretion, I went to law school.

(Laughter) In America, law is a professional degree. After finishing my college degree, I will go to law school.

When I got into law school, my grades weren't great.

It didn't go very well, to say the least.

In fact, I graduated in a law school class that allowed me to score in the top 90%.

(laughs) Thank you.

I had never practiced law for a single day in my life. It was almost unforgivable.

(Laughter.) But today, against my better judgment, against my wife's advice, I want to dust off some of those legal skills—the legal skills that remain.

I don't want to tell you a story

I would like to file a lawsuit.

I want a stubborn, evidence-based, dare-legal case to rethink the way businesses operate.

So, dear jurors, take a look at this.

This is called the candle problem.

Some of you may know.

It was created in 1945 by a psychologist named Karl Dunker.

He created this experiment and it is used in many other experiments in behavioral sciences.

And this is how it works. Let's say I'm an experimenter.

I'll take you to your room.

I'll give you a candle, a thumbtack, and a match.

And I say to you, "Your job is to attach the candles to the wall so that they do not drip onto the table."

What would you do?

Many people try to pin their candles to the wall.

doesn't work.

I saw someone making a move here. Some people have the great idea of ​​lighting a match, melting the sides of the candle, and trying to stick it to the wall.

Great idea. doesn't work.

And eventually, after 5 or 10 minutes, most people find a solution. You can see it here.

The key is to overcome the so-called functional fixity.

Looking at the box, it looks like nothing more than a container for the tacks.

But it can also have other functions as a candle holder.

I would like to tell you about an experiment using the candle problem conducted by a scientist named Sam Glucksberg, who is currently enrolled at Princeton University in the United States. This shows the power of incentives.

He called the participants together and said, "We'll see how quickly we can solve this problem."

Speaking to a group, he said: "I'll try to time it to establish a standard that is the average of how long it usually takes someone to solve this kind of problem."

He rewarded the second group.

"If you're in the top 25% of fastest times, you get $5.

If you're the fastest player we're testing here today, you'll get $20. ”

This was a few years ago, adjusted for inflation, and worth a few minutes of work.

That's a great motivation.

Q: How quickly did this group resolve the issue?

Answer: It took three and a half minutes longer on average.

3.5 minutes longer.

So, I'm American. I believe in the free market.

That's not what it should be, is it?

(Laughter) If you want people to perform better, reward them. right?

Bonuses, commissions and your own reality show.

Motivate them.

But that is not the case here.

There are incentives designed to sharpen your thinking and accelerate your creativity, but they do the exact opposite.

It slows thinking and stunts creativity.

The interesting thing about this experiment is that it's not an anomaly.

This has been repeated over and over again for nearly 40 years.

These accidental motivations work in some situations.

But for many tasks, it often doesn't really work or does harm.

This is one of the most certain discoveries in the social sciences, as well as one of the most neglected.

I have spent the last few years researching the science of human motivation, specifically the dynamics of extrinsic and intrinsic motivation.

And I tell you, it's not even close.

When we look at science, there is a discrepancy between what science knows and what business does.

What's amazing here is, think about the set of assumptions and procedures that underlie our business, how our business operating system motivates people, and how it utilizes human resources. That it is built entirely around these extrinsic motivators: carrots and sticks.

In fact, this is sufficient for many 20th century tasks.

But in the challenges of the 21st century, that mechanical reward-and-punishment approach doesn't work, often doesn't work, and often hurts.

let me show off

Glucksberg did another similar experiment and presented the problem in a slightly different way, as you can see here.

Attach the candle to the wall so that the wax does not drip onto the table.

Same deal. You: We are timing the norm.

You: We are giving incentives.

What happened this time?

This time the encouraged group kicked the other group's ass.

why?

'Cause once the tacks come out of the box, it's pretty easy, right?

(Laughter) If-then rewards work very well for this kind of task with simple rules and a clear goal.

Rewards by their very nature narrow our focus and centralize our minds. That's why it works in so many cases.

So for tasks like this, narrow focus tasks where you see your target right there and zoom straight towards it, it works quite well.

But in a real candle problem you don't want it to look like this.

The solution is around the corner. I want to look around.

That reward actually narrows our focus and limits our potential.

Let me explain why this is so important.

In Western Europe, much of Asia, North America and Australia, white-collar workers are doing less of this type of work and more of this type of work.

Routine, rules-based, left-brain tasks, such as certain types of accounting, financial analysis, and computer programming, have become fairly easy to outsource and automate.

Software can do it faster.

You can get it cheaper with a low cost provider.

So what really matters is the more right-brained creative and conceptual kind of ability.

Think about your job.

Think about your job.

Does the problem you are facing, or the problem we are discussing here, have clear rules and a single solution?

No, the rules are cryptic.

If a solution exists, it would be surprising and non-trivial.

Everyone in this room has their own version of the candle problem.

And for candle problems of any kind, in any sector, the "if-then" rewards, the ones we've built so many businesses on, don't work.

it drives me crazy.

And here comes the problem.

This is not an emotion.

have understood? I'm a lawyer; I don't believe in emotions.

This is not a philosophy;

I am American. I don't believe in philosophy.

(Laughter) This is a fact, or as they say in my hometown of Washington, D.C., a real fact.

(Laughter) (Applause) Let me give you an example.

Let's organize the evidence here.

I am not speaking, I am arguing.

Jurors, please give us some evidence. One of the great economists of our time, Dan Ariely, he and three colleagues conducted a study of several MIT students.

They gave MIT students a plethora of games that required creativity, motor skills, and concentration.

We then offered three tiers of rewards for performance: small, medium, and large rewards.

If you do it really well, you will be rewarded a lot.

what happened?

As long as the task contains only mechanical skill bonuses, it works as expected. In other words, the higher the salary, the better the performance.

However, when the task required even rudimentary cognitive skills, higher rewards led to lower performance.

Then they said, 'Let's see if there's a cultural bias here.

Let's go to Madurai, India and test it. ”

Living standards are lower.

In Madurai, modest pay by North American standards makes more sense there.

Same deal. Lots of games, 3 levels of rewards.

what happens?

Those who offered moderate rewards did not perform better than those who offered small rewards.

But this time people offered the best rewards and did the worst.

On 8 of the 9 tasks examined in the 3 experiments, performance decreased with higher incentives.

Is this some kind of dangerous socialist conspiracy going on here?

No, they are economists from the Massachusetts Institute of Technology, Carnegie Mellon University, and the University of Chicago.

Do you know who sponsored this research?

US Federal Reserve Bank.

That's the American experience.

Cross the pond to the London School of Economics (LSE), the alma mater of 11 Nobel Prize winners in economics.

A training ground for great economic thinkers like George Soros, Friedrich Hayek and Mick Jagger.

(Laughter) Last month, just last month, LSE economists examined 51 studies of performance-based compensation plans within companies.

Here's what they said: “We know that financial incentives can have a negative impact on overall performance.”

There is a discrepancy between what science knows and what business does.

And as we stand in the rubble of economic collapse, my concern is that too many organizations base their talent and talent decisions and policies on outdated, untested assumptions rooted in folklore rather than science.

And if we really want to get out of this economic turmoil, if we really want high performance on the defining challenges of the 21st century, the solution is to do no more wrong, to lure people with sweet carrots and threaten them with sharper whips.

A completely new approach is required.

The good news is that scientists who have studied motivation have given us this new approach.

It is built around intrinsic motivation.

Around the desire to do something because it's important, because you like it, because it's interesting, or because it's part of something important.

In my view, the new operating system for our business revolves around three things: autonomy, proficiency, and purpose.

Autonomy: The urge to direct one's life.

Mastery: The desire to get better and better at what matters.

Purpose: A desire to do what you do for something greater than yourself.

These are the building blocks of an entirely new operating system for our business.

Today I want to talk only about autonomy.

In the 20th century, we came up with this way of thinking about management.

Management does not come naturally.

Management is a TV, not a tree.

someone invented it

It doesn't work forever.

Management is great.

Traditional management concepts are best when it comes to compliance.

But if you're looking for engagement, it's better to have autonomy.

Some examples of certain radical notions of self-orientation.

You don't see it much, but you get the first move that something really interesting is happening. What that means is paying people properly and fairly, absolutely. It's about taking money off the table and giving people a lot of autonomy.

some examples.

How many of you have heard of a company called Atlassian?

looks like less than half.

(Laughter) Atlassian is an Australian software company.

And they do some incredibly cool things.

A few times a year, they tell engineers, 'For the next 24 hours, do whatever you want, unless it's part of your regular job.

Work on whatever you want. ”

Engineers use this time to come up with cool patches of code or come up with elegant hacks.

Then, at the end of the day, we present everything we've developed to our teammates and the rest of the company in this rough all-hands meeting.

Being Australian, we all drink beer.

They call it FedEx Day.

why?

It's cute; not bad.

This is serious trademark infringement, but it's pretty clever.

(Laughter) That day of focused autonomy produced a series of software fixes that might not have existed.

It worked so well that Atlassian took 20% of the time to the next level. The famous story took place at Google. This allows engineers to spend 20% of their time doing what they love.

They have autonomy over their time, their work, their team and their craft.

great autonomy.

As many of you know, at Google, about half of our new products, including Gmail, Orkut, and Google News, are launched in that 20% period.

Let's take a more radical example. It's called a result-only work environment (ROWE). It was created by two American consultants and has been deployed by over a dozen companies in North America.

At ROWE people don't have schedules.

They appear when they want.

They don't have to be in the office at a particular time or at all times.

they just have to get their work done.

How they do it, when they do it, and where they do it is entirely up to them.

Conferencing in such an environment is optional.

what happens?

Almost across the board, productivity increases, employee engagement increases, employee satisfaction increases, and turnover decreases.

Autonomy, mastery, and purpose are the building blocks of new ways of doing things.

Some people might look at this and say, "Hmm, that sounds good, but it's utopia."

And I say, "No.

In the mid-1990s Microsoft launched an encyclopedia called Encarta.

They put in place all the right incentives and commissioned experts to write and edit thousands of articles.

A well-compensated manager oversaw the whole process and ensured it was completed on budget and on time.

A few years later another encyclopedia was launched.

Different model, right?

do it for fun

Do it because you want to.

Just 10 years ago, if you went to an economist anywhere, you said, ``We have two different models for creating an encyclopedia.

Who would win in a direct confrontation? ”

Ten years ago, no dispassionate economist anywhere on Earth would have predicted the Wikipedia model.

This is an epic battle between these two approaches.

This is the motivational Ari Frazier, right?

This is the thriller of Manila.

intrinsic motivation and extrinsic motivation.

Autonomy, proficiency, purpose, carrots and sticks, who wins?

Intrinsic motivation, autonomy, proficiency, and purpose in knockout.

Let me finish.

There is a discrepancy between what science knows and what business does.

This is what science knows.

One: 20th century rewards, the motivations we think of as a natural part of business, work, but only in a surprisingly narrow range of situations.

2: Such "if-then" rewards often destroy creativity.

3: The secret to high performance is not rewards or punishments, but an invisible intrinsic drive - the drive to do things for yourself.

The willingness to do things is what makes it important.

And here is the best part.

we already know that.

So if we can mend this discrepancy between science and business, if we bring our motivation, our concept of motivation into the 21st century, if we get past this lazy and dangerous carrot and stick ideology, if we can strengthen our business, if we can solve a lot of the candle problem, and maybe, maybe - we can change the world.

I will put my affairs on hold.

(applause)

The early vision of wireless power was actually basically conceived by Nikola Tesla about 100 years ago.

No one thought to transmit power wirelessly.

They thought, "If you don't use it, who will?"

So he actually started doing different things.

I made a Tesla coil. This tower was built on Long Island in the early 1900s.

And the idea was to be able to transmit power anywhere on Earth.

I will never know if this worked. In fact, I believe the Federal Bureau of Investigation removed it for security purposes sometime in the early 1900s.

But the only thing we get from electricity is that we love it so much.

I mean, think how much we love this.

Even just walking outside, there are trillions of dollars invested in infrastructure around the world, the wires that carry electricity from where it is created to where it is used.

Another thing is that we love batteries.

And for those of us who care about the environment, 40 billion disposable batteries are manufactured each year for power, typically within inches or feet of where very cheap power is available.

So before coming here, I thought, 'You know, I'm from North America.

We have some reputation in the US as well. ”

So I thought I'd check it out first.

So definition number 6 is the definition of the word "suck" in North America.

Wires suck, they really do.

please think about it. Whether it's you in the picture or something under your desk.

Another thing is that it also drains the battery.

And they really do.

Have you ever thought about what this would look like?

40 billion of these things were built.

This is what happens.

They fall apart, they fall apart, and they end up here.

So when we talk about expensive power, the cost per kilowatt hour to power anything with battery power is around £200 to £300.

Think about it.

The world's most expensive grid power is a thousand times less.

Fortunately, one of the other definitions of "suck" included in it creates a vacuum.

And nature really hates vacuums.

What happened a few years ago was that a group of theoretical physicists at MIT came up with this concept of actually transferring power over distance.

Basically, they were able to light a 60 watt bulb at a distance of about 2 meters.

Efficiency reached about 50%. By the way, this is still thousands of times more efficient than a battery doing the same thing.

But I was able to ignite it and it was very successful.

This was actually an experiment. Therefore, we can see that the coil is slightly larger.

From their point of view, the light bulb was a very simple task.

It all started when a professor woke up in the middle of the night for three days in a row because his wife's mobile phone ran out of battery.

And so he thought. "Why is there so much electricity in the walls, but some of that electricity is going into my phone and I can't sleep?"

And he actually came up with this concept of resonant energy transfer.

But inside a standard transformer there are two coils of wire.

And these two coils of wire are actually very close to each other and actually transmit power magnetically and wirelessly only over very short distances.

The method Dr. Soljacic came up with was to use this technique to separate the coils in the transformer farther than the size of the transformer. This is similar to how opera singers break glass on the other side of the room.

It's a resonance phenomenon, and he actually won the MacArthur Fellowship, nicknamed the Genius Award, last September for his discovery.

So how does it work?

Imagine a coil. For the engineers, it also has a capacitor.

And if you can get that coil to resonate, what happens is that it pulses at an alternating frequency, which, by the way, is pretty high.

And if you can bring another device that only operates at that frequency close enough to the source, you can actually make them so-called strong couples and transfer magnetic energy between them.

And what you do is start with electricity, turn it into a magnetic field, take that magnetic field and turn it back into electricity so you can use it.

The number one question I get asked often.

In other words, people worry about the safety of their mobile phones.

Look. What about safety?

First of all, this is not a "radiative" technology.

No radiation.

There is no electric field here. it's the magnetic field.

It stays in the so-called source, or device.

And in fact, the magnetic field we are using is basically about the same as the Earth's magnetic field.

We live in a magnetic field.

Another great thing about this technology is that it can only transfer energy to things that operate at exactly the same frequency.

And it is virtually impossible in nature to do so.

And finally, there are government agencies everywhere that regulate all our activities.

They pretty much set exposure limits in the field, and everything I'm going to share with you today seems to fall under those guidelines.

mobile electronics.

Home appliances.

The cord under the desk, I'm sure everyone here has something similar or a battery.

There are also industrial uses.

And finally, electric cars.

These electric cars are beautiful.

But who would want to connect them?

Imagine driving into your garage. We built a system for that. When you drive into the garage, the car will automatically charge as the floor has mats plugged into the wall.

And indeed, the car charges safely and efficiently.

There are all sorts of other applications as well. Implantable medical device. If you can seal it, you don't have to lose your life with an infection anymore.

Credit card, robot vacuum cleaner.

So I want to spend a few minutes explaining how it actually works.

What I'm trying to do here is show you most of what's here.

You have a coil.

That coil is connected to the R.F. An amplifier that produces a high frequency oscillating magnetic field.

We put it behind the TV.

By the way, I'm trying to make it look a little easier than it actually is.

It contains a lot of electronics, secret sauces, and all sorts of intellectual property.

But what happens after that is that the field is created.

This will create one on the opposite side.

If the demo gods were willing, we should see it in 10 seconds or so.

10 seconds actually, I don't know if anyone ever thought about hooking up a TV while using just the cord.

Usually you have to press a button to move. So I figured I'd have to put a little computer in it and wake it up to tell it to do that.

So plug it in.

A magnetic field is generated here.

That will create one here.

And like I said, within about 10 seconds you should start to know...

This is a commercial -- (applause) color television.

Please try to imagine. you get one of these. I would like to hang it on the wall.

How many people would you like to hang on your wall?

please think about it. I don't want ugly code hanging around.

Imagine if it could be removed.

Another thing I want to talk about is safety.

So nothing is happening. I'm fine

Just to be on the safe side, let's try again.

But almost immediately, people ask, "How small can this be? Can it be small enough?"

Remember, Dr. Sorjacic's first idea was his wife's cell phone beeping.

So I wanted to show you something.

We are the designers of this kind of equal opportunity.

This is Google G1.

As you know, this came out recently.

Runs the Android operating system.

I feel like I've heard someone talk about that before.

It's strange. It comes with a battery.

WiTricity also has coiled electronics on the back.

And if you can get your hands on a camera -- ok, that's great -- look a little closer and you'll see...

You are looking at a mobile phone that is completely wirelessly powered.

(Applause.) And I'm sure some of you are Apple enthusiasts.

So it turns out that it's not easy for Apple to get inside your phone.

So I put a little sleeve on the back, but this guy should be able to wake up too.

If you have an iPhone, you know the green center.

(Applause.) And Nokia.

You can see what we did there put a little thing in the back to do it. In fact, it will probably also beep as it progresses.

However, it is usually used to illuminate the screen.

So imagine these things could go into the ceiling.

they were able to get into the floor. In fact, it can invade under your desktop.

So if you have your wallet with you when you walk into the house or come home, it works in your wallet.

You don't have to worry about connecting them again.

And think what it does for you.

So at the end, I thought I'd put up one more slide as a sort of immortal vision for The New Yorker.

For those who can't read, "This certainly seems to be some kind of wireless technology."

Thank you very much.

(applause)

What I want to talk about is really the world's biggest problem.

I'm not talking about "skeptical environmentalists". It's probably a good choice too.

(Laughter.) But I'm going to tell you, what's the big problem in the world?

And before I say anything else, I have to tell all of you to get out your paper and pen. Because we're going to ask you to help us find out how we do it.

So get out your pen and paper.

In short, there are many problems in the world.

I will list some of them.

800 million people are hungry.

One billion people do not have clean drinking water.

2 billion people have no sanitation.

HIV and AIDS kill millions.

The list goes on and on.

Two billion people will be severely affected by climate change.

There are many problems there.

In an ideal world, we should be able to solve them all, but in reality we don't.

It doesn't really solve all problems.

And if not, the question I think we need to ask ourselves is why that's being raised in the economics session -- that if we don't do all the things, we really have to start asking ourselves, which one needs to be resolved first?

That's the question I want to ask you.

If you could spend $50 billion over the next four years to do good in this world, where would you spend it?

We have listed 10 of the world's biggest challenges. Climate change, epidemics, conflict, education, financial instability, governance and corruption, malnutrition and hunger, migration, sanitation and water, subsidies and trade barriers.

We believe that in many ways these encompass the world's greatest problems.

The obvious question is, what do you think is the biggest thing?

Where do I start to resolve these issues?

But that's the wrong question.

This was actually the question asked at the Davos meeting in January.

But, of course, asking people to focus on problems is problematic.

Because you can't solve the problem.

Indeed, the greatest problem we have in the world is that we all die.

But you don't have the technology to solve it, do you?

So it's not about prioritizing problems, it's about prioritizing solutions to problems.

And it, of course, gets a little more complicated.

To climate change like Kyoto.

For epidemics, it may be a clinic or a mosquito net.

In the case of conflict, it would be UN peacekeepers and so on.

What I'm asking you to do is write down in 30 seconds what you think are probably some of your top priorities. I know this is kind of an impossible task.

And also, of course, that's where economics gets evil, but the first thing we shouldn't do is write it down.

What should be at the bottom of the list?

Please, take 30 seconds, perhaps talk to your neighbors, and think of top and bottom priorities for solutions to the world's biggest problems.

The amazing part of this process, which I would love to do, is that I only have 18 minutes. I've already spent a lot of time on it.

I would like to elaborate on this process to get you thinking. We actually did it.

Also, I highly recommend thinking about how you prioritize in practice. Also, I think we will discuss this later.

Of course, you have to ask yourself why the hell wasn't a list like this made before?

One of the reasons is that prioritization is very unpleasant.

nobody wants to do this.

Of course, any organization would like to be high on such a list.

But no organization hates not being high on the list.

And since there are far more non-number one spots on the list than number one spots, it makes perfect sense not to want to make such a list.

In the nearly 60 years since we founded the United Nations, we've never really made a basic list of all the big things that the world can do, and we've never asked which of these things should be done first.

So that doesn't mean we haven't prioritized. Any decision is a prioritization. So, of course, we still prioritize, even if implicitly. And it's unlikely to be as good as if you actually did the prioritization and actually went and talked about it.

So what I'm suggesting is that for a very long time there have been situations where there was a menu of choices.

There's a lot we can do, but we don't have a fixed price or size.

We were out of ideas.

Imagine walking into a restaurant and grabbing this big menu card, but having no idea what the price is.

You know, there's pizza. I don't know what the price is.

It may be $1. Maybe $1,000.

It could be a family size pizza. It could be a very personal sized pizza, right?

We would like to know these things.

And that is exactly what the Copenhagen Consensus is really trying to do: put a price on these issues.

Basically, this is the Copenhagen Accord process.

We have brought together 30 of the world's best economists, three in each field.

So we asked three of the world's top economists to write about climate change.

what can we do What will the cost be and what are the benefits?

The same is true for infectious diseases.

Three of the world's top experts talk about what we can do

What is the price?

What should we do about it and what will be the consequences?

and so on.

Then, in May 2004, eight of the world's top economists, including several of the world's top economists and three Nobel laureates, gathered in Copenhagen.

We called them the "Dream Team".

The presidents of Cambridge University decided to call the university the Real Madrid of the business world.

It works very well in Europe, but not here at all.

And what they basically did was create a prioritized list.

And you will wonder why an economist.

And of course, I'm so glad you asked that question -- (laughter) -- because it's a very good question.

Of course, it's important to ask a malaria expert if you want to know about malaria.

If you want to know about climate, ask a climatologist.

But if you want to know which of the two should be addressed first, you can't ask either. Because it's not their job.

That's what economists do.

they prioritize.

They make you do the sort of tedious task of what to do first and what to do after.

Here is that list and what I want to share with you.

Of course, you can also see it on the website, and I'm sure we'll talk more about it as the day goes on.

They basically made a list of bad projects. Fundamentally, a $1 investment returns a sub-$1 project.

Then there are fair projects, good projects, and very good projects.

And of course it's a very good project for us to start.

I will work backwards to produce the best project in the end.

These were bad projects.

As you can see, at the bottom of the list was climate change.

This makes a lot of people uncomfortable, and maybe it's also one of the things people say I shouldn't come back.

I would like to talk about it because it is really interesting.

Why did it come out?

And I really try to get back to this one too. Because this is probably one of the things on the list you wrote down that we disagree on.

The reason they came up with it being a bad deal to do Kyoto, or more than Kyoto, is simply because it's very inefficient.

I am not saying that global warming is not happening.

That's not to say it's not a big problem.

But there is very little we can do about it, and it comes at a very high price.

Basically, the average for all macroeconomic models is that if everyone agrees, Kyoto would cost about $150 billion a year.

That's a good amount.

This is two to three times the amount of global development assistance we give to the Third World each year.

But it does little good.

All models show that warming will be delayed by about 6 years in 2100.

In other words, people in Bangladesh who were flooded in 2100 can wait until 2106.

This is a little better, but not much better.

So what I'm saying here is, "We spent a lot of money doing a little good."

For reference, the United Nations actually estimates that half that, about $75 billion a year, could solve all the world's major basic problems.

We can provide clean drinking water, sanitation, basic health care and education for every human being on the planet.

So we have to ask ourselves. Would you like to spend twice as much money doing little good?

Or half the price for doing an amazing amount of good?

And that's what makes it a bad project.

If we had all the money in the world, it doesn't mean we wouldn't want to do it.

But when it doesn't, it's simply not our top priority.

The Just Project - note I'm not going to comment on all of this - epidemics, just the scale of basic health services - it was successful simply because, yes, the scale of basic health services is great.

It has many good effects, but it is also very costly.

Again, what this tells us is that we suddenly start thinking about both sides of the equation.

If you look at the good projects, a lot of sanitation and water projects came in.

Again, sanitation and water are very important, but infrastructure also costs a lot.

So, when discussing how we should address the world's problems, I would like to offer at least four top priorities that should be addressed first.

The fourth most important issue is malaria, or malaria.

The incidence of malaria is about several [million] people are infected each year.

Affected countries could even see a cost increase of some percentage of GDP each year.

An investment of about $13 billion over the next four years could cut that incidence in half.

We could avoid about 500,000 deaths, but perhaps more importantly, we could avoid about [1 million] infections each year.

We will greatly improve their ability to deal with the many other issues they have to deal with. Of course, in the long run, it also addresses global warming.

This third best was free trade.

Essentially, the model showed that if free trade could be achieved, especially if U.S. and European subsidies could be cut, we could essentially pump the world economy to a staggering figure of about $2.4 trillion a year, half of which would go to the Third World.

Again, the point is that in about two to five years, very quickly, we can actually lift 200 to 300 million people out of poverty.

That would be the third best thing we could do.

The next best thing is to focus on malnutrition.

It's not just malnutrition in general, but there are very cheap ways to deal with malnutrition, or micronutrient deficiencies.

Basically, about half of the world's population is deficient in iron, zinc, iodine and vitamin A.

Investing around $12 billion could have a serious impact on the problem.

It will be the second best investment we can make.

And the best projects will focus on HIV/AIDS.

Essentially, $27 billion in investment over the next eight years could avert 28 million new HIV/AIDS infections.

Again, what this does and what it focuses on is that there are two very different ways to deal with HIV/AIDS.

One is treatment. Another is prevention.

Again, in an ideal world, you would do both.

But in a world that doesn't do either, or doesn't do very well, you should at least ask yourself where to invest first.

And treatment is much more expensive than prevention.

Essentially, what this focuses on is that investing in prevention can do more.

Basically, for the amount of money we spend, we get X benefits in treatment and 10 times better in prevention.

Again, our primary focus is prevention, not cure.

What this actually does is make us think about our priorities.

I want you to look at my priority list, did I get it right?

Or maybe we got closer to what we came up with here?

One of them, of course, is climate change.

A lot of people seem to think we shouldn't do that.

If for no other reason, we should also address climate change simply because it is such a big issue.

But, of course, it doesn't solve all problems.

The world has many problems.

And what I want to make sure is that if you actually focus on the problem, focus on the right problem.

Something that can do a lot of good, rather than a little good.

And, as a matter of fact, I think one of the Dream Team participants, Thomas Schelling, said it very well.

One thing people forget is that in 100 years, when most of the impacts of climate change are being talked about, people will be much richer.

Even in the UN's most pessimistic impact scenarios,

It is estimated that the average person in developing countries in 2100 will be about as wealthy as we are today.

They will probably be two to four times richer than us.

And of course we will be even richer than that.

But the point is, when we talk about saving and helping people in Bangladesh in 2100, we are not talking about poor Bangladeshis.

Actually, we are talking about a fairly wealthy Dutch man.

And the real point, of course, is, 100 years from now, would you like to spend a fortune helping a very wealthy Dutch man?

Or do we now want to help the really poor people in Bangladesh who really need help and can help very cheaply?

Or, to use Schelling's words, imagine that you were, and will be, wealthy Chinese, wealthy Bolivians, and wealthy Congolese looking back at 2005 in 2100 and saying: “They cared so much about helping me with climate change and had little interest in helping my grandfather and great-grandfather, they could have helped more, but who needed more help?”

I hope this helps you understand why you need to clarify your priorities.

Even if it doesn't match our typical view of the issue.

Of course, that's mainly because climate change has a good image.

There is a song called "Day After Tomorrow", which is wonderful.

It's certainly a good movie to watch, but don't expect Emmerich to cast Brad Pitt in his next film about digging toilets in Tanzania. (Laughter) It doesn't make much of a movie.

So in many ways, I see the Copenhagen Accord and the whole debate on priorities as a defense against the tedious problem.

To make us understand that it's not meant to make you feel better.

It's not about creating the most media attention, it's about creating a place where you can actually do the best.

An important other objection to make is that I am somehow, or we are somehow, assuming the wrong choice.

Of course, in an ideal world all things should be done - I certainly agree.

I think we should do everything, but we don't.

In 1970 the developed countries decided that we would spend twice as much to developing countries as we did in 1970.

Since then, our aid has been halved.

So it doesn't look like we're really on the road to solving all the big problems all of a sudden.

It's been said in the same way, but what about the Iraq War?

We spend $100 billion, why not use it to do good in the world?

I agree with that.

If any of you can convince Bush to do so, so be it.

But of course, the point is, even if we get another $100 billion, we want to use it in the best possible way, right?

So the real issue here is to bounce back and think about what the right priorities are.

Just to be clear, is this the correct list we made?

As you know, when you ask the world's best economist, you inevitably ask an old white American man.

And they aren't always a great way to see the world at large.

So we actually invited 80 young people from all over the world to solve the same problem.

The only two conditions were that I was studying at university and that I could speak English.

First, the majority of them were people from developing countries.

They all had the same material, but they could and did stray far from the scope of their discussion to come up with their own list.

And what is surprising is that the lists are very similar, with malnutrition and disease at the top and climate change at the bottom.

I've done this many other times.

There were many other seminars and college students.

They all make the very same list.

And it gives me great hope. I believe there is always a way to start thinking about your priorities and what is important in the world.

Of course, in an ideal world, we still want to do anything.

But if you don't do that, you can start thinking about where to start.

I see the Copenhagen Accord as a process.

We did this in 2004, and hopefully in 2008 and 2012 we can bring more people together and be better informed.

We need to start thinking about political triage as well as planning the right path for the world.

It's about starting to think, "Instead of doing something that you can hardly do at a very high cost or that you don't know how to do, let's do something great right now that can do a huge amount of good at a very low cost."

At the end of the day, we may disagree with the debate about how these should actually be prioritized, but we have to be honest and candid to say that some things we do and some things we don't.

If you worry too much about some things, you won't care about others.

So I hope this helps us set better priorities and think about how we can work better for the world.

thank you.

I will tell you about your way of thinking.

Does your thinking correspond to my dataset?

(Laughter) If not, you'll need to upgrade one or the other.

When I talk to my students about global issues or listen to them over coffee breaks, they always talk about “us” and “them.”

And when they come back to the lecture room, I ask them, "What do you mean by 'us' and 'they'?"

"Oh, it's very simple. This is the western world, the developing world," they say.

"We learned it in college."

And what is that definition? "definition?

Everyone knows," they say.

But hey, this is how I push it.

Then a girl said very wisely, "It's very easy.

In the Western world, small families live longer.

In developing countries, it's a short life for a big family. ”

And I like that definition. Because it allows them to transfer their thinking to datasets.

And here is the dataset.

So we see that it is family size that is on this axis here. On this axis, each woman has 1, 2, 3, 4, and 5 children.

And here is life expectancy, life expectancy, 30, 40, 50 years.

It was exactly the world view that the students talked about.

And actually this is a bedroom story.

Whether a man and a woman decide to have a small family and take care of their children, and how long they will live.

I'm talking about the bathroom and the kitchen. Soap, water and food will keep you alive.

And the students were right. It wasn't that the world was made up. The world here, here, consisted of a series of large-family, short-lived nations. developing world.

And there was a set of countries that were the Western World.

They had few families and lived long lives.

And here you will see the amazing things that happened in the world during my lifetime.

Developing countries then applied soap and water and vaccination.

And all of the developing countries have started to apply family planning.

And some contribute to the US for technical advice and investment.

And I see the world moving to families with two children and 60-70 years of life.

However, some countries remain back in the region.

And it turns out that there is still Afghanistan here.

We have Liberia. We have the Congo.

So nations live there.

So the problem I had was that the world view that the students had was consistent with the reality of the world in the year their teacher was born.

(Laughter) (Applause) And we've actually played this all over the world.

As I attended the Global Health Conference here in Washington last week, I realized that even active people in the United States have a wrong notion. They do not see improvements in Mexico and China in their relations with the United States.

Look here as you move forward.

please.

they catch up. We have Mexico.

These two social dimensions are on par with the United States.

Fewer than 5% of global health professionals were aware of this.

Mexico, a great country, has a problem with the influx of arms across its borders from the north. So I had to stop it. Because Mexico has a strange relationship with the United States.

But if we were to change this axis here, we would put in income per capita instead.

Income per person. you can put it here.

And we will see something completely different.

By the way, while I'm fixing this, I'm teaching you how to use our website Gapminder World. Because this is a free utility on the net.

And now, when we finally get it right, we can go back 200 years of history.

And you can find the US there.

Other countries can also be displayed.

And now we have income per capita on this axis.

At that time, the United States had only a few thousand or two thousand dollars.

And life expectancy was 35 to 40 years, similar to Afghanistan today.

And I'll show you what happened in the world now.

This is an alternative to studying history for a year at university.

Look at me for a minute now and you'll see everything.

(Laughter) You can see that the brown bubbles are Western Europe and the yellow bubbles are America, and they're starting to get richer and healthier.

And this is 100 years from now, and the rest of the world has been left behind.

here we come And it was the flu.

That's why I'm afraid of the flu.

I still remember it. Lower life expectancy.

And then we come. It wasn't until independence began.

Look here, over there is China, over there is India and this is what happened.

Did you notice that there's Mexico over there?

Mexico isn't exactly on par with the US, but it's pretty close.

It's especially interesting to look at China and the United States for 200 years. My eldest son is now working for Google after Google bought this software.

Because, in fact, this is child labor. My son and his wife have been sleeping in a closet for years and developed this.

And my youngest son studied Chinese in Beijing.

So they come with two perspectives that I have.

And my son, the youngest son, studied in Beijing, China and gained a long-term perspective.

On the other hand, my eldest son who works at Google should grow every quarter or half a year.

Alternatively, Google is pretty lenient, so it might take another year or two.

But in China they are seen for generations, because for 100 years they remember a very embarrassing time when they went backwards.

And they will remember the first half of the last century, it was really bad and we were able to go ahead with this so-called Great Leap Forward policy.

But this was in 1963.

Mao Zedong eventually brought health to China, then died, and then Deng Xiaoping started this amazing advance.

Isn't it strange to see America grow its economy first and then gradually get richer?

China, on the other hand, has applied education, nutrition, and the benefits of penicillin and vaccines, as well as knowledge of family planning, to get healthy much faster.

And Asia has the potential to achieve social development before economic development.

So, as a professor of public health, it's no wonder all these countries are growing so fast right now.

Because what you see here, what you see here, is the flat world of Thomas Friedman.

Not really, really flat.

But middle-income countries here I encourage my students to stop using the concept of "developing world".

Because talking about the developing world is like having two chapters in American history.

The final chapter is about the present and President Obama, and the other chapter is about the past, covering everything from Washington to Eisenhower.

Because that's what we see in the developing world, from Washington to Eisenhower.

We can actually go from Mayflower to Eisenhower. And it will be lumped together in the developing world. Developing countries are naturally growing cities in surprising ways. There are great entrepreneurs out there, but there are also countries that are crumbling.

So how can we understand this better?

Well, one way to try is to see if you can look at the income distribution.

This is the income distribution of people in the world from 1 dollar. There is food here.

These people go to bed hungry.

And this is the number of people.

That's $10 whether you're on the public health service system or the private health service system. This is a place where you can provide medical services for your family and school for your children. Here are the OECD countries: Green, Latin America and Eastern Europe.

This is East Asia, and the light blue color is South Asia.

This is how the world changed.

This is how it changed.

Can you see it growing? And how are hundreds of millions and billions of people lifted out of poverty in Asia?

And where does it go?

And now that I've come into forecasting, I have to stop at the entrance of Lehman Brothers, because -- (laughter) forecasting is no longer valid there.

Perhaps the world will too.

And go forward like this.

But more or less, this is what will happen in the future, and our world cannot be seen as divided.

Here we have high-income countries, led by the United States. In between are the emerging nations, which are providing big bailouts. And here we have low-income countries.

So yes, this is where the money is coming from, the fact that they've been saving over the last decade.

And here are low-income countries with entrepreneurs.

And here are countries that are in disintegration and war: Afghanistan, Somalia, parts of the Congo, Darfur.

we have all these things at the same time.

That is why explaining what happened in developing countries is so problematic.

So different, what happened there.

That's why I propose a slightly different approach.

And there are big differences within countries.

I heard that the departments here are divided by region.

This includes Sub-Saharan Africa, South Asia, East Asia, Arab States, Eastern Europe, Latin America and OECD.

And on this axis is GDP.

And when it comes to this, it's no surprise that health, child survival, and sub-Saharan Africa are at the bottom.

But if you split it up and split it into national bubbles, the size of the bubble here is the population.

Then Sierra Leone and Mauritius would be very different.

Even within Sub-Saharan Africa there are such differences.

And you can split other things. This is South Asia, the Arab world.

Well, everyone in the various departments.

Eastern Europe, Latin America, OECD countries.

And here it was. Our world has continuity.

It cannot be divided into two parts.

Here is Mayflower. This is Washington, building and building a nation.

Here is Lincoln, pushing them forward.

Eisenhower brought modernity to countries.

And today this is the United States.

And we have a country so far.

Now, this is important in understanding how the world has changed.

At this point I decided to pause.

(Laughter.) And it's my duty, on behalf of the rest of the world, to thank the US taxpayer for the VHS.

Most people don't realize it -- no, I'm not kidding.

This is very serious.

For 25 years, the United States has continuously sponsored an exceptional methodology for measuring child mortality that allows us to understand what is happening in the world.

(Applause.) And it's the U.S. government at its best to provide facts without claiming them to be good for society.

We then provide the data free of charge on the Internet and make it available worldwide. thank you very much.

Quite the opposite of the World Bank, which used government money and tax dollars to compile data and sell it for a small profit, in a highly inefficient Gutenberg fashion.

(Applause.) But the people doing this at the World Bank are some of the best people in the world.

And they are highly skilled professionals.

But like us, we want to upgrade our international institutions so that they can serve the world in a modern way.

The United States is one of the best when it comes to free data and transparency.

And it's not easy to say it out of the mouth of a Swedish public health professor.

(laughter) And I'm not being paid to be here, no.

I want to show you what happens with the data and what this data can show.

Look at this. This is the world.

Income will fall and child mortality will rise.

And what happened in the world?

Since 1950, child mortality has declined over the past 50 years.

And it is DHS that makes it possible to know it.

And my income has increased.

And the blue former developing countries are mixed with the former Western developed countries.

we have a continuum. But, of course, there is still Congo there. As always in history, we still have poor countries.

And what we heard today about a whole new approach to making that happen is the bottom billion.

And how quickly did this happen?

Well, MDG4.

The US is less enthusiastic about using MDG 4.

But you are the primary sponsor for allowing us to measure because you are the only child mortality rate we can measure.

And we said before that we should be down 4% a year.

Let's see what Sweden did.

We boasted of the rapid progress of society.

That was where we were in 1900.

In 1900, Sweden was there.

Child mortality in Bangladesh was the same as in 1990, despite low incomes.

They started very well. They made good use of the aid.

They vaccinated their children. they can get better water.

And infant mortality decreased by a staggering 4.7% per year. They beat Sweden.

I have ruled Sweden for the same 16 years.

The second round is Sweden in 1916 versus Egypt in 1990.

please. Again, the United States is part of the reason.

They get clean water, feed the poor, and fight malaria.

5.5 percent. These are faster than the Millennium Development Goals.

And Sweden's third chance, here against Brazil.

Here in Brazil we have made amazing social improvements over the last 16 years, and progress is faster than Sweden.

This means that the world is converging.

Middle-income countries, emerging economies are catching up.

They have migrated to cities and are better supported there as well.

Well, Swedish students are protesting at this point.

They said, "This is unfair because these countries had vaccines and antibiotics that were not available in Sweden.

We have to have real-time competition. ”

have understood. The year I was born, I'll give you Singapore.

Child mortality in Singapore was twice as high as in Sweden.

It is the most tropical country in the world and a wetland right on the equator.

Come on, let's go. It took some time before they became independent.

But then they started economic growth.

And they made a social investment. They escaped malaria.

They've got a great healthcare system that outperforms both the US and Sweden.

I never thought we would beat Sweden!

(Applause.) All of these environmentally friendly countries have achieved the Millennium Development Goals.

These yellow people are about to do just that.

These reds are countries that have not done so and need to improve their policies.

It's not a simple extrapolation.

We really have to find ways to help those countries in a better way.

We must respect the efforts of middle-income countries.

And the whole way you look at the world has to be factual.

This is a dollar per person. This is HIV in every country.

blue is africa

The size of the bubble represents the number of people infected with HIV.

There we see the tragedy of South Africa.

About 20 percent of the adult population is infected.

And even though they have fairly high incomes, they have huge numbers of HIV-infected people.

But you can also see that there are African countries here.

There is no HIV epidemic in Africa.

There are 5-10 countries in Africa that are on the same level as Sweden and the United States.

Also, some people are very tall.

And we will show you what is happening in Botswana, one of the best countries in Africa with the most vibrant economy and good governance.

they have a very high standard. It's coming down.

However, it is not currently declining. Because, with the help of PEPFAR, the treatment is working. And people aren't dead.

And it turns out that it is the war that caused this, it is not so easy.

Because here in the Congo there is a war going on.

And here in Zambia there is peace.

And it's not the economy. Rich countries are a little more expensive.

When Tanzania is divided by income, the richest 20 percent of Tanzanians have more HIV than the poorest.

And it's really different in each country.

Look at the states of Kenya. they are very different.

And this is what you see.

Not severe poverty. It is perhaps the peculiar situation of simultaneous sexual partnerships in some countries of South Africa and East Africa, or between heterosexuals in some countries.

don't be africa Don't make it racial.

Make it a local issue. And, in each location, take precautions that are available in that location.

After all, the poorest of the billion people have suffering that we don't know about.

People who live without mobile phones, have never seen a computer, or have no electricity at home.

This is the disease, Konzo, I've spent 20 years in Africa figuring it out.

This is due to the rapid disposal of toxic cassava roots under conditions of starvation.

It is similar to pellagra, which was epidemic in Mississippi in the 1930s.

Similar to other nutritional diseases.

It never affects the wealthy.

We have seen it here in Mozambique as well.

This is the trend in Mozambique. This is an epidemic in northern Tanzania.

You have never heard of the disease.

But Ebola is not the only disease affected.

wreak havoc all over the world.

And in the last two years, 2,000 people have become lame in the southern tip of the Bandungdu region.

It was an illegal diamond trade from UNITA-controlled areas of Angola.

That is now gone and we are facing big financial problems.

And a week ago, for the first time, I had four lines on the Internet.

Don't confuse the development of emerging economies with the amazing capabilities of people in middle-income and peaceful low-income countries.

1 billion still remains a mystery.

And we have to have more concepts than just developing countries and the developing world.

We need a new way of thinking. The world is converging, but the bottom billion are not.

They are still poorer than ever.

It is not sustainable and will not happen around one superpower.

But you will remain one of the most important and most anticipated superpowers for the time being.

And this institution will play a very important role, not just for the United States, but for the world.

That's a very bad name, State Department. This is not the State Department.

World department.

And we have high hopes for you. thank you very much.

(applause)

i love theater

I love the idea of ​​being able to transform myself into a different person and see life in a whole new light.

I really like the idea of ​​people sitting in the same room for hours and listening.

The idea is that in that moment, in that room, everyone gathers, regardless of age, gender, race, color, or religion.

In that moment, we are together beyond time and space.

Theater awakens our senses and opens the door to our imagination.

And imagination is what makes us explorers.

Our imagination is what makes us inventors, creators, and unique beings.

In 2003, I was asked to produce an original program and started developing "Upwake".

"Upwake" is the story of Zero, a modern businessman who is stuck between dreams and reality, unable to decipher between dreams and reality, and who puts his life in a suitcase to go to work.

I wanted "Upwake" to have the same audiovisual quality as the movie.

And I wanted to let my imagination run wild.

So I started drawing the story that popped up in my head.

If Antoine de Saint-Exupéry, the author of The Little Prince, had been here, he would have cut three holes in that box and said your sheep were in them.

Because if you observe carefully enough, things will start to appear.

This is not a box. These are renderings of my imagination from head to paper to screen to life.

In "Upwake," Building suits up, Zero tap-dances on a giant keyboard, clones himself with a scanner, tame and whips a computer mouse, sails from a piece of paper into a dream world, and blasts off into space.

I wanted to create an environment that moves and transforms like an illusionist.

Instantly travel from one world to another.

I wanted to have humor, beauty, simplicity and complexity, and use metaphors to propose ideas.

For example, at the beginning of the show, Zero deejay dreams and reality.

Technology is the vehicle that allows me to express my vision live and on stage in high definition.

So today I would like to talk about the relationship between theater and technology.

Let's start with technology.

(Fuse blows) Okay. Let's start with theater.

(laughter) (boom) (click, click, bang) (laughter) (applause) Thank you.

"Upwake" lasts 52 minutes and 54 seconds.

It projects 3D animations onto all four sides of the stage that I control.

Using animation and projection was a process of discovery.

I used it as a partner on stage, not as a special effect.

"Upwake" has no special effects or tricks.

The design is simple and minimal, yet luxurious and intricate.

After 344 frames and four and a half years, what began as a commissioned and one-man show has become a collaboration of 19 of the most talented artists.

And here are some excerpts.

(Applause.) Thank you.

So this is a relatively new show that we're starting to tour right now.

And in Austin, Texas, I was asked to do a small demonstration at school in the afternoon.

When I arrived at one school, I never expected this to happen. 600 children were crammed into the gymnasium waiting.

I was a little nervous to perform without animation, costumes or makeup.

But then the teachers came to me and said they had never seen children so enthusiastic.

I think the reason is that I was able to use their language and reality to transfer them to another world.

Something happened along the way.

Zero became a person, not just a character in a play.

Zero doesn't speak, he's neither male nor female.

Zero is Zero, the little hero of the 21st century, and Zero can influence far more people than I can.

It is as much about taking theater out of the box as it is about bringing new fields into the box.

As a street performer, I've learned that everyone wants connection.

And usually, if you're a little bit special and don't resemble your human appearance, people will want to join in and feel loud.

It's as if they resonated something within them.

It's as if the mystery of who they interact with and connect with makes them feel a little more like themselves.

Because through your mask they unmask themselves.

Being human is an art form.

I know that theater can improve people's quality of life, and I know that theater can heal.

I have worked as a doctor clown in a hospital for two years.

I have seen sick children and grieving parents and doctors bounce back and be transported to moments of pure joy.

I know theater brings us together.

Zero wants to captivate today's and tomorrow's generations and tell different stories through different mediums.

Comic books. Quantum physics video game.

And Zero wants to go to the moon.

In 2007, Zero launched a green campaign, suggesting friends and fans turn off the lights every Sunday from 7:53 pm to 8:00 pm.

The idea is simple and basic. It's not original, but it's important, and it's important to participate.

A revolution will occur.

It's a human and technological revolution.

It's movement and emotion.

information.

It's visual. it's a musical. It's a sensory thing.

it's conceptual. it is universal. It goes beyond words and numbers.

It's happening.

The natural progression of science and art discovering each other to better express and define the human experience.

The way we think, the way we share, the way we express our stories—our evolution—is being revolutionized.

This is an era of communication, connection and creative collaboration.

Charlie Chaplin revolutionized cinema, telling stories through music, silence, humor and poetry.

He is gregarious and his character "The Tramp" has spoken to millions.

He gave entertainment, joy and comfort to so many human beings when they needed it most.

We are not here to question the possibilities. We are here to challenge the impossible.

In today's science we become artists.

In today's art we become scientists.

We design our world. We invent possibilities.

We teach, we touch, we move.

Now we can harness the diversity of our talents to create intelligent, meaningful and extraordinary work. it's snowing.

(ringtone) Thank you.

(applause)

For about 35 years now, I have been fascinated by the diversity of crops, ever since I came across a rather obscure academic paper by a man named Jack Harlan.

And he described diversity within crops (such as different types of wheat and rice) as germplasm.

And he said, "This germplasm," a phrase I will never forget, "stands us between a devastating famine of an unimaginable scale."

I thought he was either really into something, or one of the academic madmen.

So, after doing some more research, I found out that he wasn't a weirdo.

He was the most respected scientist in his field.

What he understood was that biodiversity, the variety of crops, is the biological basis of agriculture.

It is the raw material and material for the evolution of our crops.

It's not a trifle.

And he also understood that the foundation was crumbling, literally crumbling.

Certainly there was a mass extinction going on in our fields and agricultural systems.

And that this mass extinction happened with very few people aware of it, and even fewer people interested.

Now, I know that many of you don't stop and think about the diversity of farming systems, but let's be honest, it makes sense.

You don't see them in the newspapers every day.

And when you go to the supermarket, you certainly don't have that many choices.

There are red, yellow and green apples, but that's it.

So let me show you a picture of one form of diversity.

Here are some beans. This photo shows about 35-40 types of beans.

Now imagine that each of these breeds could be distinguished from the others in about the same way as a Great Dane poodle.

If you wanted to show pictures of all dog breeds in the world, and put 30-40 of them on slides, you'd need about 10 slides, since there are about 400 breeds of dogs.

However, there are 35 to 40,000 types of beans.

So if I was going to show you all the beans in the world and I had a slide like this and I flipped it every second, it would take up my entire TED Talk and I wouldn't have to say anything.

But what is interesting, and what is tragic, is that this diversity is being lost.

There are about 200,000 varieties of wheat and about 200,000 to 400,000 varieties of rice, but they are disappearing.

I would like to introduce an example.

Actually this is a bit of a personal example.

In the United States, in the 1800s, where we have the best data, farmers and gardeners were growing 7,100 named apple varieties.

Imagine. 7,100 named apples.

Today, 6,800 of them are extinct and will never be seen again.

I used to have a list of these extinct apples and hand out the list to my audience when giving presentations.

I didn't tell you what it was, but I told you to look for your name, your family's name, and your mother's maiden name, as it was written in alphabetical order.

And at the end of the speech, ask, "How many people have you found names for?"

And not once did less than two-thirds of the audience raise their hand.

And I said, "Do you know? These apples are from your ancestors, and your ancestors gave them the highest possible honor.

they named them.

The bad news is they are extinct.

The good news is that a third of you didn't raise your hand. Your apple is still there.

find it. Be careful not to be added to the list. ”

So the piece of good news is that Fowler Ringo is still out there.

I have some old books here, and I would like to read one of them.

This book was published in 1904.

It's called "The Apple of New York" and this is the second volume.

You see, there used to be a lot of apples.

And the Fowler apple is described here--don't be surprised--as a "beautiful fruit."

(Laughter) I don't know if we named the apple or if the apple named us...

But to be honest, the description says "but not high quality".

And he has to go further.

It looks like something my old school teacher wrote.

"Fruits grown in New York usually do not develop properly in size or quality and are generally unsatisfactory."

(Laughter) And I think there's a lesson to be learned here. The lesson is, "So why save it?"

I get this question often. Want to save only the best?

And that question has several answers.

One thing I can say is that there is no such thing as the best.

Today's best varieties will be tomorrow's lunch for insects, pests and diseases.

Another is that Fowler apples and currently uneconomical wheat varieties may have disease or pest resistance, or some other quality needed for climate change that others don't.

So, thankfully, Fowler apples don't have to be the best apples in the world.

It's only necessary or interesting that it could have one great unique property.

That's why we should save it.

why? As a raw material, as a property that can be used in the future.

Think of diversity as giving us choices.

And of course, choice is exactly what we need in an era of climate change.

I would like to show you two slides, but first I would like to say that we at the Global Crop Diversity Trust have been working with many scientists, especially Stanford University and the University of Washington, to ask the question, "What will happen to agriculture in an era of climate change, and what traits and characteristics will crops need to adapt to climate change?"

So the answer is that in the future, in many countries, the coldest growing seasons will be hotter than anything those crops have experienced in the past.

The coldest future growing season that is hotter than the hottest past.

Is agriculture adapted to it?

don't know. Can fish play the piano?

If agriculture has not experienced it, how can it adapt?

South Asia and sub-Saharan Africa are now home to the world's poorest and most hungry populations and, ironically, the worst affected by climate change.

So I have two examples here that I would like to show you.

In the histogram in front of you, the blue bars represent the historical range of temperatures, going back in time for which temperature data exists.

And you can see that there is some difference between one growing season and another growing season.

Some are colder, some are hotter, and it's a bell-shaped curve.

The tallest bar indicates the average temperature during the most growing seasons.

In the future, in the second half of this century, it will be like a completely out-of-range red.

The Indian farming system, and more importantly, field crops, has never been experienced before.

This is South Africa. Same story.

But the most interesting thing about South Africa is that we don't have to wait until 2070 to have problems.

If by 2030 the main crop, maize or maize varieties (where 50 per cent of southern Africa's nutrient source is still in the field), is grown by 2030, maize production will already decline by 30 per cent in 2030 due to climate change.

A 30% decrease in production due to population growth, this is a food crisis. It is global in nature.

We will watch our children starve to death on TV.

Now, 20 years may seem like a long way off.

Corn has two breeding cycles.

To get this right, roll two dice.

We need to harvest climate-friendly crops in the fields, and we have to do it pretty quickly.

Well, the good news is we saved.

We have collected and preserved large amounts of biological and agricultural diversity, mainly in the form of seeds. And we store it in a seed bank, a freezer.

If you want to store the seeds for a long time and make them available to plant breeders and researchers, dry the seeds and then freeze them.

Unfortunately, these seed banks are located in buildings around the world and are vulnerable.

A disaster has happened. In recent years we have lost gene banks, seed banks in Iraq and Afghanistan. You can guess why.

in Rwanda, Solomon Islands.

And these buildings suffer disasters every day, financial problems, mismanagement, equipment failures, and so on, and every time something like this happens, it means annihilation. we lose diversity.

And I'm not talking about losing diversity in the same way you lose your car keys.

What I'm talking about is losing it, just like we lost dinosaurs. You actually lose it and never see it again.

So some of us got together and decided that enough was enough, we needed to do something about it, and that we needed a facility that could really protect our biological diversity, which is perhaps not the most charismatic of diversity.

It doesn't stare into carrot seed eyes like the panda, but it's a very important variety.

So we really needed a safe place and went quite far north to find it.

In fact, to Svalbard.

This is over mainland Norway. You can see Greenland there.

It is 78 degrees north latitude.

It is a distance that can be flown by a regular flight.

It's such a beautiful landscape. I can't even explain it to you.

It's otherworldly and beautiful.

We designed this facility in collaboration with the Norwegian government and NorGen, the Norwegian Genetic Resources Programme.

What you see is an artist's conception of this facility built in the mountains of Svalbard.

The idea of ​​Svalbard was that it would naturally be below freezing because it is cold.

But it is remote. It is remote, accessible, safe, and does not rely on mechanical refrigeration.

This is not just an artist's dream, it is now a reality.

And this next photo shows the situation in Svalbard.

And this is the front entrance of this facility.

When you open the front door, you will see this view. It's very simple. It's a hole in the ground.

This is a tunnel, you enter a tunnel carved into solid rock. About 130 meters.

Now with some security doors, it never looks like this.

Go back again and you'll enter my favorite area.

I think it's like some kind of cathedral.

And I know this tags me as a bit of a geek, but...

(Laughter) I had the happiest days of my life...

(Laughter) It's here.

(Applause.) If you walk into one of these rooms, you'll see this.

Not very exciting, but pretty inspiring if you know what's out there.

There are currently approximately 425,000 unique crop variety samples.

The facility currently has 70,000 samples of different varieties of rice.

About a year from now, we'll have over half a million samples.

That number is expected to exceed one million, and one day basically any kind of crop sample (about 500 seeds) will be able to be stored frozen at this facility.

It is a system that backs up the world's agriculture.

This is the backup system for all seedbanks. Storage is free.

Works like a safe deposit box.

The mountains and facilities are owned by Norway, but the seeds are owned by the depositor.

And if something happens, they can come back and take it back.

This particular photo you see shows national collections of international organizations in the United States, Canada, and Syria.

What's interesting is that this facility is literally the only thing I can think of these days where countries from all over the world are coming together to do something long term, sustainable and positive as they collect seeds from every country in the world.

I can't think of anything else that happened in my lifetime.

I can't look you in the eye and say there is no solution to climate change or the water crisis.

Agriculture accounts for 70 percent of the planet's freshwater supply.

I can't look you in the eye and say that there is such a solution to the energy crisis, world hunger, and peace in conflict.

I can't look you in the eye and tell you that there is an easy solution to that, but I can look you in the eye and say that none of these problems can be solved without crop diversity.

Because, in the absence of crop diversity, we are asking you to think of effective, efficient and sustainable solutions to climate change.

Because, literally, if agriculture doesn't adapt to climate change, neither can we.

And if crops can't adapt to climate change, neither can agriculture.

So this is never pretty and good.

There are many people who wish for diversity to exist, thinking only of its value.

I also agree that it's a good thing.

But it is necessary.

Therefore, I truly believe that, as an international community, we should be organized to carry out this task.

The Svalbard Global Seed Vault is a wonderful gift to us from Norway and others, but it is not the full answer.

We need to collect the diversity that remains out there.

We need to put it in a good seedbank that we can provide to researchers in the future.

You should catalog it. This is the Library of Life, but I don't think there is a card catalog for it at this time.

And we need to financially support it.

My big idea is that while we take it for granted that we donate to museums and donate to college chairs, we should really think about donating wheat as well.

A donation of $30 million will help preserve wheat diversity forever.

So we have to think a little bit in terms of those.

And my final thought, of course, is that by saving wheat, rice, potatoes, and other crops, very simply, we may end up saving ourselves.

thank you.

(applause)

Tomorrow, imagine yourself driving down the road somewhere to buy an item you found on Craigslist (perhaps a nice $3,000 mountain bike).

At that price, it's probably one of the bikes with a small electric motor - (lol) there might be some streamers from the handlebars.

(Laughter) The seller has declared that this is a cash only deal, so there is $3,000 in the car console.

Suddenly you are drawn.

During the stop, the officer asked, "Are there drugs, weapons, or large amounts of cash in the car?"

You answer honestly yes to cash, not to drugs and weapons.

It is ordered to be unloaded from the car in the blink of an eye.

A cop examines it and finds your cash.

He seized it on the spot and suspected it was part of a drug crime.

A few days later, the local district attorney will file paperwork to keep your money forever.

And all this without you being charged or convicted of any crime.

Now, you might say, "Oh, this will never happen in America."

(Laughter) Incidents like this happen every day in our country.

This is one of the most serious threats to property rights most people have never heard of.

This is called a “civil forfeiture”.

Although most people are generally familiar with criminal forfeiture, the term itself may be a little unfamiliar. So let's talk about forfeiture.

When we lose something, we either let it go or are forced to let it go.

In a criminal forfeiture, someone has been charged and convicted of a crime and must give up property related to that crime.

For example, let's say you use your car to transport and trade drugs.

You will be arrested and convicted. Now the car must be abandoned or confiscated as part of the sentencing.

It is a criminal forfeiture.

However, in civil forfeiture, no one is charged, property is charged and convicted.

(Laughter) It sounded right. Governments are actually convicting inanimate objects.

It's as if it committed a crime.

That's why civil forfeiture lawsuits have such weird names like "United States v. One 1990 Ford Thunderbird."

(Laughter) Or, "Oklahoma versus $53,234 in cash."

(Laughter) Or my personal favorite is "United States of America versus one solid gold object in the shape of a rooster."

(Laughter) Now you're thinking: How could this happen?

That's exactly what I said when my wife and I first learned about civil forfeiture while traveling.

No we weren't pulled over.

(Laughter) As part of my job as research director for a law firm, I was reading about the history of civil forfeitures, and I came across one of the cases I mentioned earlier, "United States v. 1990 Ford Thunderbird."

In that case, Carol Thomas lent her car to her son.

In the car her son committed a minor drug offense.

Law enforcement could not convict her and take the car because Carol committed no crime, but they could and did use civil forfeiture to "convict" her and take the car.

Carol was totally innocent, but she still lost her car.

In other words, she was punished for a crime she didn't commit.

I was appalled when I read this.

Why is this happening?

How is this legal?

After all, it started with our maritime law.

In the early days of our republic, the government tried to fight piracy, yes, actual piracy.

The problem was that governments often failed to catch pirates and instead used civil forfeiture to convict them of their property, thereby denying them their illegal profits.

Of course, the government could have simply received and kept the booty without necessarily resorting to civil forfeiture, but doing so would violate the most basic due process and property rights.

Well, until the 1980s and the onset of the drug war, governments rarely used civil forfeiture.

We expanded the Civil Forfeiture Act to cover drug offenses and then other types of crime.

Canada and the European Union have adopted similar provisions, so everyone like Russ Caswell is now caught in a web of confiscation.

Russ Caswell owned a small budget motel in Tewkesbury, Massachusetts.

His father built the motel in 1955 and Russ took it over in the 1980s.

During the years Russ owned the motel, people would occasionally rent rooms and commit drug crimes.

Russ did not condone the act. In fact, as soon as I found out about it, I called the police.

Mr. Russ had committed no crime, but that didn't stop the U.S. Department of Justice from seizing his motel just because other people had committed crimes there.

But Rath's case was not alone.

Between 1997 and 2016, the U.S. Department of Justice requisitioned over 635,000 properties.

This means that tens of thousands of people lose their property each year without ever being charged or convicted.

And we're not necessarily talking about major drug lords or headline-grabbing financial scammers involved in cases involving hundreds of thousands, if not millions of dollars.

Many of these seizures and forfeitures involve ordinary people like Russ Caswell, you and me.

But things get even worse.

Wondering where all this cash and wealth is?

In most places, they are kept by law enforcement agencies.

And they use it to buy equipment, fix buildings, and even pay salaries and overtime.

This is a clear conflict of interest.

It creates perverted profit incentives that can distort law enforcement.

And this is also a haunting question for law enforcement people.

Roger Peterson, former police chief of Rochester, Minnesota, said of the choices police officers often face:

He explained: Suppose I'm a police officer and I see a drug deal.

Now I have a choice. Will you go after buyers to clear the streets of illegal drugs, or will you go after sellers to get cash for agents to use?

So it's easy to understand why police officers go after cash.

It was just such a situation that forced Philadelphia police to seize an entire house.

In 2014, Chris and Marcella Slovelis' son sold $40 worth of drugs on the street of his home.

$40.

The police watched the deal go through.

They could have arrested the buyer and confiscated the drugs, but they didn't.

The Slovelies' son could have been arrested on the street and robbed of $40.

But they didn't.

They waited at his house to arrest him, so that the whole house could be seized.

The house was worth $350,000.

This is what I mean by perverted profit incentives.

But the Slovelies case was no exception.

"City of brotherly love" Philadelphia, "Athens of America", birthplace of the Constitution, "Cradle of Liberty", "City to love you back" with the Liberty Bell and Independence Hall--(laughter) Philadelphia was running the confiscated machine.

From 2002 to 2016, Philadelphia was forfeited over $77 million, including 1,200 homes.

I sold cars, jewelry, electronics, all of them and kept the proceeds.

And if it hadn't been for the class action lawsuit - our team's class action lawsuit - they would have just kept going (applause and cheers) Thank you.

We forced them to change their confiscation practices and compensate victims.

(Applause and cheers) When our team first started researching confiscations in 2007, we had no idea how much money we could make from confiscations.

In fact, no one knew.

Since 2001, federal law enforcement agencies have collected approximately $40 billion ($1 billion for B), more than 80% of which is due to civil forfeiture, according to our groundbreaking study, Policing for Profit, for the first time.

Unfortunately, we don't know how much state and local agencies have taken because many states don't require it to be reported.

Therefore, until we reform the forfeiture system, we will never know how much forfeiture activity actually takes place in the United States.

And we desperately need reform.

The legislature should abolish civil forfeiture and replace it with criminal forfeiture.

And all proceeds from the forfeiture should go to a neutral fund, such as the General Fund.

When confiscated earnings no longer have a direct impact on law enforcement budgets, that's when we end profit-oriented policing.

(Applause.) Now, as you can imagine, law enforcement doesn't like these recommendations.

(Laughter) They can lose a lot of money and believe that civil forfeiture is an effective means of fighting crime.

The problem is that it doesn't.

In June 2019, we published research showing that forfeitures do not improve crime-fighting.

The report also found that law enforcement seeks more forfeitures during economic downturns.

So when city or county budgets are tight, law enforcement agencies use confiscations to raise money.

So it's no wonder law enforcement officials are predicting the end of crime if these reforms are adopted (laughs).

But some states have already introduced this system, and we are pushing for reform across the country because unless we reform confiscation, this can happen to anyone.

It can happen in the US, it can happen in the UK, it can happen across the European Union and other countries.

You and I, people like Mr. and Mrs. Slovelies and Russ Caswell, just going about their daily lives can get caught up in plans we never thought of.

It's time to end policing for profit once and for all.

thank you.

(applause and cheers)

This is the story of two ancient cities and the tree that determined their fate.

Uruk in 3000 BC was more densely populated than New York City today.

This congested capital had to continually expand its irrigation system to feed its growing population.

2,500 years later, the city of Anuradhapura in Sri Lanka had similar problems.

They too were growing, and like Uruk, their cities relied heavily on elaborate irrigation systems.

As the uruk grew, farmers began cutting down trees to make room for more crops.

But in Anuradhapura trees were sacred.

Their city is said to have a Bodhi tree branch under which Buddha himself attained enlightenment.

Religious veneration slowed farmers' businesses, and the city began planting additional trees in city parks.

Initially, the Uruk expansion worked well.

However, Uruk's irrigation system was polluted because there were no trees to filter the water.

Evaporation of water left behind mineral deposits, making the soil too salty for agriculture.

Conversely, Anuradhapura's irrigation system is designed to work in conjunction with the surrounding forest.

Their city eventually grew to more than double Uruk's population, and even today Anuradhapura treasures trees planted over 2,000 years ago.

We may think that nature is irrelevant to urban spaces, but trees have always been an integral part of a successful city.

Trees act like natural sponges, absorbing rainwater runoff before returning it to the atmosphere.

The root network protects against landslides and allows the soil to retain water and filter toxins.

Roots prevent flooding while reducing the need for storm drains and water treatment plants.

The porous leaves trap carbon and other pollutants and purify the air, making them vital in the fight against climate change.

Humans have discovered the benefits of these trees for centuries.

But trees are not only important to the health of urban infrastructure. They also play an important role in public health.

In 1870s Manhattan, there were very few trees outside the island parks.

Without trees to provide shade, buildings absorb up to nine times more solar radiation during deadly summer heatwaves.

The scorching heat, combined with the poor sanitary standards of the time, made the city a breeding ground for germs like cholera.

In modern Hong Kong, tall buildings and underground infrastructure make it difficult for trees to grow.

This can lead to dangerously poor urban air quality, leading to bronchitis and reduced lung function.

Trees also affect our mental health.

Studies have shown that green foliage can sustain alertness and reduce stress levels.

Inpatients looking at brick walls have even been shown to recover more slowly than those looking at trees.

Luckily, many cities abound with views like this, and it's no coincidence.

Already in the 18th century, city planners began to recognize the importance of urban trees.

In 1733, Colonel James Oglethorpe planned the city of Savannah, Georgia so that no district was more than a two-minute walk from the park.

After World War II, Copenhagen forged all new developments along five highways, each sandwiched between parks.

This layout made the city more resilient to pollution and natural disasters.

And trees in cities don't just benefit people.

Portland Forest Parks protect the area's natural biodiversity, and Portland is home to a wide variety of native plants, 112 bird species, and 62 mammal species.

No city is as enthusiastic about trees as Singapore.

Since 1967, the Singapore government has planted over 1.2 million trees. These include one in a 50-meter-tall vertical garden called the Supertree.

These structures rely on solar energy and collected rainwater to sustain themselves and nearby greenhouses.

More than 50% of Singapore's land area is now covered by trees and vegetation, reducing the need for air conditioning and promoting low-pollution transportation.

It is estimated that by 2050, over 65% of the world will live in cities.

Urban planners can lay a green foundation, but it's up to the people who live in urban forests to make them homes for non-humans.

Talk about one of the world's biggest problems and how to solve it.

I would like to start with a little experiment.

If you wear glasses or contact lenses, or have had laser refractive surgery, would you please raise your hand?

Unfortunately, there are too many of you for me to do a proper statistic.

But it's probably about 60 percent of the room. This is because it is roughly equivalent to the percentage of the population of the developed world that receives some form of vision correction.

The World Health Organization has various estimates of the number of people who need glasses, with the lowest estimate at 150 million.

They also put it at around $1 billion.

But in fact, I would argue that we have just conducted an experiment here and now that shows that the need for corrective glasses is around half of the total population worldwide.

And the problem of poor vision is actually not just a health problem, but also an educational problem, an economic problem, and a quality of life problem.

Glasses are not that expensive. Quite a lot.

The problem is that there are not enough ophthalmologists in the world who can use the model of corrective spectacle delivery that is practiced in developed countries.

There are too few eye care professionals.

This little slide shows an optometrist. The little blue people represent about 10,000 people, which is the UK proportion.

This is the ratio of optometrists to people in sub-Saharan Africa.

In fact, some countries in sub-Saharan Africa have one optometrist for every eight million people.

how do i do this How do you resolve this issue?

I came up with a solution for this problem and came up with a solution based on adaptive optics.

And the idea is that if you make glasses and adjust them yourself, the problem will be solved.

What I want to do is show that glasses can be made.

I will show you how to make glasses. Keep this in your pocket.

I am nearsighted. When you finally look at the sign, you can barely see it.

So -- okay, I can see the guy running there now, and I can see the guy running there.

Now, I made glasses according to my prescription.

Next step in my process.

So, this time I made glasses according to my prescription.

Well, I made these glasses...

Well, I made the glasses to my prescription...

...now...

And now I made glasses. that's it.

(Applause) Now, this pair is not the only one in the world.

In fact, the technology is evolving.

I started working on this in 1985 and it has evolved very slowly.

About 30,000 units are currently in use.

And they are in 15 countries. they are spread all over the world.

And I have a vision, and I will share it with you.

I have a global vision as my vision.

And the vision is to enable 1 billion people to wear the glasses they need by 2020.

To make it happen -- this is an early example of the technology.

The technology is further developed and needs to come down in cost.

In fact, the pair is currently priced at around $19.

However, the cost must be drastically reduced.

We're trying to serve people who live on $1 a day, so we have to bring it down.

How do you resolve this issue?

Start getting into the details.

This slide basically describes all the problems you have.

How do you distribute? How do you think about how to make things fit?

How do you convince people that you have a vision problem?

How do you deal with the industry?

And the answer is research.

What we have done is to establish a Vision Center for the Developing World here at the University.

If you want to know more, please visit our website. thank you.

(applause)

Last year, some BuzzFeed employees planned to prank their boss Ze Frank on his birthday.

They decided to put a family of kid goats in his office.

(Laughter) Well, BuzzFeed had just recently signed on to the Facebook Live experiment, so naturally we decided to live stream the entire event over the internet to capture the moment when Ze walks into the office and discovers the livestock.

We thought the whole thing would be over in like 10 minutes. Hundreds of employees log in for insider jokes.

But what happened?

Zee was late. Going out for a drink, being invited to a meeting, having a long meeting, going to the bathroom.

More and more people logged in to see the goats.

By the time Ze arrived at the venue over 30 minutes later, 90,000 viewers had watched the live stream.

Well, our team had a lot of discussions about this video and why it was so successful.

It wasn't the greatest live video we've ever produced.

The biggest one we went to was about the cheese fountain.

But it performed much better than we expected.

What did we not expect about office goats?

Now, any reasonable person can have any number of hypotheses.

Maybe people just love baby animals.

Maybe people love office pranks.

Maybe people love talking about their bosses and birthday surprises.

However, our team didn't think much about the content of the video.

We were thinking about what people are thinking and feeling when they watch the video.

We read some of the 82,000 comments made during the video and hypothesized that their excitement is because they are part of a shared expectation of what is to come.

For just a moment, they became part of the community and that made them happy.

We therefore decided that this hypothesis needed to be tested.

What can I do to test this exact same thing?

The next week, armed with the additional knowledge that food videos were extremely popular, we dressed the two of them in hazmat suits and wrapped rubber bands around the watermelon until it exploded.

(laughter) 800,000 people watched the 690th rubber band explode a watermelon, making it the biggest Facebook Live event to date.

The question I get most often is, "How can I make something go viral?"

The question itself is wrong. it's not about anything.

It's about what the people doing, reading, and watching are thinking.

Most media companies today think in terms of subject matter and format when they think of metadata.

Goat stuff, office pranks, food stuff, list, video or quiz, 2,000 words long, 15 minutes long, 23 embedded tweets or 15 images.

This kind of metadata is kind of interesting, but it doesn't really make sense in practice.

What if, instead of tagging what kind of articles or videos, we asked, "How does this help people do their real work?"

Last year we started a project to formally classify content in this way.

We called it "Cultural Mapping".

This is the formalization of an informal practice that we have had for a very long time. In other words, don't just think about the subject, think about the content. Also think about the role your content plays for your readers and viewers. In fact, mostly think about it.

Let me show you the map we have today.

Each bubble is a specific job, and each group of bubbles of a specific color are related jobs.

Humor first.

"Makes me laugh."

There are many ways to make someone laugh.

You might be laughing at someone, you might be laughing at a particular humor on the internet, or you might be laughing at a good, clean, non-aggressive dad joke.

"This is me." Identity.

People are increasingly using the media to explain, "This is who I am."

This is my upbringing, this is my culture, this is my fandom, this is my guilty pleasure, and this is how I laugh about myself. ”

"It helps me connect with others."

This is one of the Internet's greatest gifts.

It really amazes me when I find media that accurately portrays bonding with someone.

This is a group of jobs that help me do something. It helps you resolve arguments, it helps you learn something about yourself and others, it helps you explain your story.

This is a series of tasks that make me feel, make me curious, make me sad, and restore my faith in humanity.

Many media companies and creators put themselves in the shoes of their audience.

But in the age of social media, we can go even further.

People are connecting on Facebook and Twitter and increasingly turning to media to converse and talk.

If we were able to contribute to building a deep connection between the two of us, we would have done a real job for them.

Let me give you some examples of how this happens.

This is one of my favorite lists. "32 memes you should send to your sister right now"—right now.

For example, "When I heard my sister coming up the stairs while I was examining my sister's things."

Absolutely did it.

"I saw your sister get into trouble because of what you did, and I blamed your sister."

Yes, I've done that too.

This list has been viewed 3 million times.

why is that?

That's because we've done some 'this is us' jobs very well.

"Connect with family".

"Makes me laugh."

Below are some of the thousands of comments sisters have sent to each other using this list.

In some cases, the content of the work may be revealed after the fact.

The quiz 'Choosing an outfit will tell you your exact age and height' has gone viral and has been viewed 10 million times.

10 million views.

So, did you actually identify the exact age and height of 10 million people?

can't believe it. It's unbelievable.

In fact, it wasn't.

(Laughter) This quiz turned out to be very popular among the 55+ women group. (Laughter) They were surprised and delighted that BuzzFeed judged them to be 28 years old and 5 feet 9 inches.

(Laughter) "They made me 34 years younger and 7 inches taller.

I dress for comfort and I don't care what anyone says.

Age is a state of mind. ”

The quiz was successful not because it was accurate, but because it allowed them to do a very important task: humble bragging.

Now we can apply this framework to recipes and food as well.

A recipe's normal job is to tell you what to make for dinner or lunch.

This is how I usually brainstorm recipes. I think about what ingredients to use and what kind of recipe to make, and in the end I sometimes ask for a job to sell it.

But what if, on the contrary, we thought about work first?

One brainstorming session involved a bonding task.

So can you create a recipe that brings people together?

This is not your normal brainstorming process at a food publisher.

I also know that people like to bake together and like to challenge together. So I decided to challenge myself by coming up with a recipe that includes these two elements. Can you get people to say, "Hey friend, let's see if we can do this together"?

The resulting video was the "funniest brownie ever" video.

With 70 million views, it was a huge success on all fronts.

And people said exactly what we were aiming for: "Hey Colette, we have to make this. Are you up for the challenge?"

"Game Start."

It served its original purpose of bringing people together through baking and chocolate.

I am really excited about the possibilities of this project.

When we talk to content creators about this framework, they immediately get it, no matter what beats, countries, or languages ​​they cover.

Cultural mapping has therefore helped scale up employee training on a large scale.

When we talk to advertisers and brands about this project and this framework, they get it right away. Advertisers often understand more than media companies how important it is to understand the role their products play for their customers.

But the reason I'm most excited about this project is because it changes the relationship between media and data.

Most media companies think of media as "mine".

How many fans do I have?

How many followers have you gained?

How many times have I been viewed?

How many unique IDs does your data warehouse have?

But that misses the real value of owning your data.

The more data we can capture about what really matters to you, and the better we understand the role our work plays in your real life, the better content we can create and deliver to you.

who are you?

how did you get there

where are you going?

what do you care about

What can you tell us?

That is cultural mapping.

thank you.

(applause)

Two years ago, I left central London on the Underground and ended up in a self-storage unit somewhere east of the city where I met a man selling 2,000 luxury polo shirts.

And as I made my way down the hallway, the broken lights flickered, giving it the feel of a gangster movie cliché.

Our men had come early and were waiting for me in front of a four padlocked unit on the side.

Our first interaction was like a verbal sparring match where he threw the first punch.

Who was I? did i have a business card?

So where should we sell?

Then he started to open up and now it was my turn.

Where do polo shirts come from?

What documents did he have?

And when is his next package due to arrive?

I had a fine line between asking enough questions to get what I needed and not enough to make him suspicious. Because he didn't know I was a counterfeit investigator (laughs). Checking the product for signs of counterfeiting, such as bad seams on the label or a large brand logo stamped on the front of the package. After about 20 minutes or so, I finally tried to leave, but he insisted that he walk with me to the street and back to the train station.

And the feelings after these meetings are always the same. my heart is beating like a drum. Because you never know if they actually bought your story or if they start following you to find out who you are.

Turning the first corner and looking back, it's the first relief when they're not standing there.

But what the counterfeit polo shirt seller was totally unaware of was that all I saw and heard was that his house would be raided at dawn, and eight men would wake him out of bed on his doorstep and seize all his merchandise.

But it turns out that he was just a pawn at the end of a network of counterfeiting that spanned three continents, and was just the first loose thread I started pulling in the hope that it would all unravel.

Why go through so much trouble?

Well, maybe counterfeiting is a victimless crime?

These big companies make enough profit that if anything counterfeiting is just free advertising, right?

And consumers believe that buying and selling counterfeits is not such a big deal.

But what I'm trying to say here is that it's never true.

What holiday tourists don't realize about these fake handbags is that they were likely sewn by children trafficked from their families. What auto repair shop owners also don't realize about these fake brake pads is that they may be stuffed in the pockets of organized crime gangs involved in drugs and prostitution.

Those two things are scary to think about, but counterfeit goods are even funding terrorism, which makes things even worse.

Let's understand it for a moment.

Terrorists sell fakes to fund attacks on cities that seek to make us all victims.

You wouldn't buy a live scorpion because it could sting you on your way home, but if you knew that the profits could buy someone a bullet that would kill them and other innocent people six months later, would they still buy a fake handbag?

maybe not.

Now it's time to get clean.

When I was younger, sure, it might still seem a little clingy, but I bought a fake watch while on vacation in the Canary Islands.

But why am I saying this?

Well, we've all done it, or know someone who has done it.

And until this moment, perhaps neither you nor I thought twice about it until we answered a cryptic 20-word ad to become an intellectual property investigator.

It said that he had "fully trained and even had some international travel."

Within a week, I created the first of many aliases. In the decade since then, I've researched fake car parts, alloy wheels, fake pet grooming gear, fake bicycle parts and, of course, the counterfeiter's favorite fake luxury leather goods, clothing and shoes.

And what I've learned over a decade of researching fakes is that once you start scratching the surface, you find that fakes are rotten to the core. So do people and organizations that make money from counterfeits. Because the fakes are profiting on a huge scale.

Only 100-200% can make money selling drugs on the street.

You can sell 2,000 percent fakes online with almost the same risks and penalties.

And this quick and easy money is then the money to fund the more serious kinds of crime and to make these organizations, the criminal gangs, look more legitimate.

Now let me talk about the actual case.

Earlier this year, a series of raids took place in one of my longest-running investigations.

In Turkey, five warehouses were raided and more than two million pieces of finished counterfeit clothing were seized, requiring 16 trucks to remove them all.

But this gang was smart.

They launched their own fashion brand with a registered trademark and did everything in their power to do a photo shoot on a yacht in Italy.

And they would use these totally unheard of and dubious brand names as a way to ship full containers of fakes to shell companies they set up all over Europe.

And documents found during those raids show that customs officials falsified shipping documents so that they literally had no idea who sent the goods in the first place.

Less than two years after police accessed a single bank account, they discovered that nearly 3 million euros had been laundered out of Spain, and just two days after the raid, it was discovered that the gang was trying to bribe a law firm to get their shares back.

I still don't know where that money went or who it ended up in, but I can assure you that it will never benefit someone like you or me.

But they're not just low-level street thugs.

They are business professionals and ride first class.

They use convincing fake invoices and documents to trick legitimate businesses into making everything look real, and set up eBay and Amazon accounts just to compete with those who have already sold counterfeit goods.

But this isn't just happening online.

For several years, I used to attend car trade shows in huge exhibition spaces, and apart from Ferraris and Bentleys and flashing lights, there were companies selling fakes. A company that puts a brochure on the counter and another below it if you ask the right question.

And they sell me fake auto parts, defective fake auto parts that are estimated to cause more than 36,000 deaths each year and more deaths on the road.

Counterfeiting is set to become a $2.3 trillion underground economy and the damage that can be done with that kind of money is truly terrifying...

Because fakes fund terrorism.

Fake trainers on the streets of Paris, fake cigarettes in West Africa, and pirate music CDs in the United States are all used to fund trips to training camps, buy weapons and ammunition, or feed explosives.

In June 2014, French security services stopped monitoring the communications of brothers Saeed and Sheriff Kouachi, who had been on the terrorist watch list for three years.

But that summer, police had just learned that Sheriff was buying fake trainers from China, so it signaled a shift from extremism to what would be considered low-level petty crime.

The threat is gone.

Seven months later, the two brothers broke into the offices of Charlie Hebdo magazine, killing 12 people and wounding 11 with guns raised from fake proceeds.

So by all accounts, this is not a distant problem happening in China.

it's happening here.

And Paris is nothing special.

Ten years ago, in 2004, a Madrid commuter train was blown up, killing 191 people.

The attack was partially funded by the sale of pirated music CDs in the United States.

Two years earlier, al-Qaeda training manuals explicitly recommended selling counterfeit goods as a good way to support terrorist organizations.

But nevertheless, despite evidence linking counterfeit goods to terrorism, we continue to buy them, and the demand has increased to the point where we have 'I love real fakes' shops in Turkey.

Tourists have also taken photos and given 5-star reviews on TripAdvisor.

But did that same tourist go to a store named 'I love real fake Viagra pills' or 'I really love terrorism financing'?

i doubt it.

Many of us think we are utterly powerless against organized crime and terrorism and that we can do nothing against the next attack, but I believe we can.

You can do that if you become an investigator.

The way to make these networks dysfunctional is to cut their funding, which means cutting demand and changing the mindset of victimless crime.

Let's all identify counterfeiters and don't give them money.

So here are some tips from one investigator to another as you get started.

First: This is a typical online counterfeiter website.

Notice the URL.

For example, if you come across a website like medical-insurance-bankruptcy.com while shopping for sunglasses or camera lenses, start being very suspicious.

(laughter) Counterfeiters register expired domain names as a way to maintain Google page rankings for older websites.

Number 2: Do websites offer 75% off the latest collections while claiming that everything is 100% authentic?

Look for words like "master copy," "overrun," and "direct from the factory."

They could write this all in Comic Sans, it's that much of a joke.

LOL Third: If you make it to the checkout page and don't see the "https" or padlock symbol next to the URL, you should actually consider closing the tab. They represent active security measures to keep your personal and credit card information safe.

Finally, look for the "Contact Us" page.

If you can only find a generic web form and no company name, phone number, email address, or street address, then you've solved the case.

I found a counterfeiter.

Sadly I'll have to go back to Google and start my shopping search all over again, but I wasn't fooled, so that's only good news.

As the world's most famous fictional detective says, "Watson, the game is on."

Only this time, investigators, the game is painfully realistic.

So the next time you shop online, or anywhere, take a closer look, ask a little deeper questions, and before handing over cash or clicking "buy" ask yourself, "Is this real?"

Tell a friend who was buying a counterfeit watch that he might have made his next attack one day closer.

Also, if you come across a fake Instagram ad, don't keep scrolling and report it to the platform as a scam.

Shine a light on the counterfeit dark forces that hide in plain sight.

So please spread the word and don't stop investigating.

thank you.

(applause)

It's hard to believe it's been less than a year since the extraordinary moment when the financial, credit, that powers our economy was frozen.

Massive cardiac arrest.

Perhaps it's a repercussion and reward for what vampire predators like Bernie Madoff we've seen before have been doing for years.

Steroid abuse, overeating, etc.

And it's only been a few months since the government poured billions of dollars into trying to keep the whole system alive.

And we're in a very strange kind of Twilight Zone right now. No one knows for sure what worked there and what didn't.

We have no clear map, no compass to guide us.

I don't know which experts to trust anymore.

What I'm trying to do is give some pointers on what the landscape is on the other side of the crisis, what we should be looking out for, and how we can actually take advantage of the crisis.

One definition of leadership is “the ability to take advantage of the smallest possible crisis to the greatest possible effect”.

And I would like to talk about how we can make sure that this crisis, which is by no means a small one, can be put to good use.

First of all, I would like to tell you a little bit about my hometown.

I come from a very confused background and maybe suited for confusing times.

I have a Ph.D. As you can see, in the telecommunications field.

I trained as a monk under this man for a short time.

I was a civil servant, and I was also in charge of this person's policies.

But what I want to talk about begins when I was a student in this city, in this university.

And it was, and still was, a beautiful place for balls and punts, beautiful people, many of whom took to heart President Ronald Reagan's comment, "Why take the risk, even though hard work is said to do no harm?"

But when I was here, many of my fellow teenagers were in a very different situation, dropping out of school at a time when youth unemployment was skyrocketing, and essentially hitting a wall in terms of opportunities.

And I spent a good amount of time with them, not punts.

And though they were not devoid of wit, or grace, or energy, they were devoid of hope, work, and prospects.

And when a man is not allowed to be useful, he soon begins to think of himself as useless.

That was great for the music business at the time, but not so good for other things.

Since then, I have wondered why capitalism is remarkably efficient in some ways and inefficient in others, so revolutionary in some ways and uninnovative in others.

Now, since that time, we have actually gone through an extraordinary boom that will be the longest boom in the history of this country.

There was unprecedented wealth and prosperity, but that growth didn't always give us what we needed.

H.L. Menken once said: "Every complex problem has a simple solution, which is wrong."

I'm not saying growth is bad, though, but it's pretty impressive how many things haven't improved over the years of growth.

Depression rates continued to rise across Western countries.

Looking at America, the percentage of Americans who have no one to talk to about important things has increased from one in ten to one in four.

My commute lengthened, but as you can see from this graph, the longer the commute, the more likely it is that happiness will decline.

And it became increasingly clear that economic growth does not automatically lead to social growth or human growth.

We are now at a moment when a new wave of teenagers is entering the brutal job market.

One million young people in America will be unemployed by the end of the year, and thousands will be out of work every day.

We must do whatever we can to help them, but I think we also need to ask the deeper question of whether we will use this crisis to move forward to a different kind of economy, a better balance between economy and society that is better suited to human needs.

And I think one of the lessons of history is that even the deepest crisis can be an opportunity in an instant.

They bring frontier ideas into the mainstream.

They often lead to much-needed acceleration of reforms.

And you would have seen it in the '30s, when the Great Depression paved the way for Bretton Woods, the welfare state, and more.

And now, I think we're seeing some of the green sprouts of an entirely different kind of economy and capitalism all around us that could thrive.

You can see it in everyday life too.

In difficult times people have to do something for themselves. All over the world, from Oxford to Omaha to Omsk, we see an extraordinary explosion of urban agriculture as people take over land, take over roofs and turn barges into makeshift farms.

And I'm just part of it.

I have 60,000 of these things in my garden.

some of them. This is Atira the hen.

And I'm just a small part of a very large movement. It's about survival for some people, but it's also about a different kind of economy, less about values, about consumption and credit, and more about what's important to us.

And everywhere we see the proliferation of time banks and parallel currencies, people are using smart technology to connect all the resources (people, buildings, land) liberated by the market and connect them to those who have the most dire needs.

I think the government has a similar story.

President Ronald Reagan once again said the funniest sentence in English is "I'm from the government and I'm here to help."

But when the government intervened last year, I think people were very happy that the government was there and actually took action.

But now, months later, even the most competent politicians who swallow frogs without hiding their faces cannot hide their unease, as someone once said.

Because it is already clear how much of the huge money they put into the economy really went to fixing the past, bailing out banks and car companies, and not preparing us for the future.

How much money is being spent on tangible consumer promotion rather than solving really serious problems that we have to solve.

And everywhere, as people reflect on the unprecedented amount of money being spent on our money and that of our children, in the midst of this crisis, we are asking: Rather than simply giving money to incumbents, shouldn't we use it with a long-term vision to accelerate the transition to a green economy, prepare for an aging population, and address some of the inequalities that hurt these countries and the United States?

Indeed, we should give money to entrepreneurs, to civil society, to those who can create new things, not to big, well-connected corporations and big, clunky government programs.

And after all this, as the great Chinese sage Lao Tzu said, "Governing a great country is like cooking a small fish.

Please do not overdo. ”

And I think more and more people are asking, "Why are we consuming more instead of changing what we consume?"

Like the mayor of Sao Paulo who banned billboards, and many cities like San Francisco building infrastructure for electric vehicles.

You can see the same thing happening in the business world.

I think some bankers seem to have learned nothing and forgotten nothing.

But ask yourself. What will be the biggest sector of the economy 10, 20, 30 years from now? Not like autos or aerospace lining up for handouts.

So far, the biggest area will be health. It already accounts for 18% of the US economy and is projected to grow to 30% or even 40% by mid-century.

Aged care, childcare, employers that are already much bigger than automobiles.

Education: 6, 7, 8 percent of the economy and growing.

Environmental services, energy services, myriad green jobs, they all point to very different kinds of economies that use decentralized networks rather than just products, and that are based above all on care, relationships, and what people do to others, often one-on-one, rather than just selling products.

And I think the link between civil society issues, government issues, and business issues right now is, in some ways, very simple, but very difficult.

We know society must change radically.

We know that we cannot return to the pre-crisis state.

But we also know that only through experimentation can we discover exactly how to run low-carbon cities, care for a much older population, deal with drug addiction, and more.

And here's the problem.

Science conducts experiments systematically.

Our societies now spend 2, 3, 4 percent of their GDP systematically investing in new discoveries, science and technology, fueling the pipeline of great inventions that light up such gatherings.

Our scientists aren't necessarily much smarter than they were 100 years ago. Perhaps so, but they are getting far more support than ever before.

What is surprising, however, is that there are few comparables in society, no comparable investment, no systematic experimentation, when it comes to sympathy and empathy, relationships and care, which capitalism is not good at.

Well, I didn't really understand that until I met this man. He was 80 years old at the time, a slightly shabby man who lived off tomato soup and thought ironing was greatly overrated.

He helped shape Britain's post-war institutions, welfare state and economy, but reinvented himself as a social entrepreneur and became the inventor of a great many different organisations.

Some are big names like the Open University with 110,000 students, the Third Age College where nearly half a million seniors teach other seniors, while others are oddities like DIY Garages and Language Lines and Schools for Social Entrepreneurship.

And he ended his life by selling the company to a venture capitalist.

He believed that when he became aware of a problem, he should not tell someone to act, but rather act on his own. He said he's lived long enough and seen his ideas first despised and then successful enough that "no" should always be taken as a question, not an answer.

And his life has been a systematic experiment to find better social answers, not out of theory, but out of experimentation and experimentation involving people with the greatest intelligence about social needs, usually those who live with those needs.

And he believed that because we live with others and share the world with others, our innovation should also be with others, and we should do things for people instead of doing things for them.

Now what he did was previously unnamed, but I think it's fast becoming quite mainstream.

That's what we do at his namesake organization, trying to invent, create and launch new businesses, including schools, web companies, and medical institutions.

And we found ourselves part of a very rapidly growing global movement of social innovation institutions that use ideas from design, technology, or community organizations to develop the seeds of the future world, but not through theory but through practice and demonstration.

And they've spread from South Korea to Brazil, India, the United States, and all of Europe.

And the need for better solutions to this crisis, unemployment and community breakdown, has given them new impetus.

Some ideas are strange.

These are complaint choirs.

People get together and sing about their real troubles.

(Laughter) Some are more down-to-earth: health coaches, learning mentors, job clubs.

Others, like Social Impact Bonds, raise and invest money to keep teens out of crime or help seniors stay out of hospital, and are paid back based on the success of the project.

Now, I think the ideas that all of these represent are fast becoming common sense, recognizing the need to invest in innovation not just for technological progress, but for the progress of society, and becoming part of how we respond to the crisis.

The country set up a large health innovation fund earlier this year, as well as a public service innovation lab.

Across Northern Europe, many governments now have innovation laboratories within them.

And just a few months ago, President Obama launched the Office of Social Innovation in the White House.

And people are starting to wonder, indeed, in the same way that we invest 2, 3, 4 percent of our GDP or our economy in research and development, what if, say, 1 percent of public spending goes into social innovation, care for the elderly, new kinds of education, new ways of helping people with disabilities?

Perhaps we can achieve the same productivity gains in society that we have in the economy and technology.

And if a generation or two ago we had the big challenge of landing humans on the moon, perhaps the challenge we need to set now is to end child malnutrition, stop human trafficking, or perhaps the more familiar challenge for America and Europe, why not set the goal of extending the lifespan of our population by another billion years?

These are all goals that can be achieved within 10 years, but they require drastic and systematic experimentation not only with technology, but also with lifestyles, culture, policies and institutions.

Finally, I would like to say a few words about what I think this means for capitalism.

I think what this means is that the whole movement growing out of this fringe is still very small.

The resources of CERN, DARPA, IBM and Dupont are unmatched.

What it tells us is that capitalism will become more social.

You are already deeply immersed in social networks.

It will become more involved in social investment and social care, and in industries where value is derived not only from what you sell to others, but from your actions with others, and from your relationships, not just your consumption.

Interestingly, though, this alludes to how society can learn a few tricks from capitalism, embedding the DNA of tireless and continuous innovation into society, how to try things and grow and scale what works.

Now, I think this future will be very surprising to many people.

In recent years, many intellectuals thought capitalism had basically won.

History has ended and society has inevitably come second to economy.

But I've come to feel that the way people often talk about capitalism today is similar to how they talk about the French Revolution and the French monarchy 200 years ago, just after the Restoration.

And people said that monarchies rule everywhere because they are rooted in human nature.

We were naturally respectful. I wanted a hierarchical structure.

Just as enthusiasts of unbridled capitalism today say it is rooted in human nature, they now claim it to be individualism, inquisitiveness, and so on.

At the time, the monarchy forsaken its great challenger, popular democracy, in the same way that capitalism forsaken socialism, but this was seen as a well-intentioned but doomed experiment.

Even Fidel Castro has said that the only thing now worse than being exploited by transnational capitalism is not being exploited by transnational capitalism.

And while in those days monarchies, palaces and fortresses dominated the skylines of every city, seemingly enduring and self-assured, today it is the glittering towers of banks that dominate every metropolis.

I'm not saying the crowd is going to storm the barricades and tie all the investment bankers off the nearest streetlight, but it can be very tempting.

But I believe that, as has happened to monarchies and, interestingly, to the military, the central position of financial capital has come to an end, and it is time for it to steadily transform itself from a master into a servant of society, into a productive economy and a servant of human needs.

And when that happens, you'll remember something very simple and obvious about capitalism. That is, unlike what you read in economics textbooks, capitalism is not a self-sufficient system.

It depends on other systems, ecosystems, families and communities, and if these are not replenished, capitalism will suffer as well.

And our humanity is not only selfish, but also compassionate.

Not only competitive, but also caring.

I think we are in a time of choice because the crisis is so deep.

It is almost certain that the crisis is deepening all around us.

It could well be worse by the end of the year and even worse than it is now in a year.

But this is one of those rare moments where you have to choose between just pedaling furiously to get back to where you were a year or two ago, a very narrow idea of ​​what the economy is for, or now is the moment to jump forward, reboot and do some of the things you should have done anyway.

thank you.

(applause)

A baby cursed at birth. A fierce battle between good and evil.

True love wakes up with a kiss.

Sleeping Beauty is one of the world's most popular folktales.

But one of its most famous performances tells a story without saying a single word.

Since its premiere in 1890, "Sleeping Beauty" has become one of the most frequently performed ballets in history.

Then why is this work loved so much?

And what exactly does ballet bring to this or any other story?

At the heart of ballet are the many gestures painstakingly perfected over thousands of hours of practice by dancers.

This unique set of gestures has been used for centuries and each movement has a rich meaning and history.

But you don't have to study ballet to understand it, any more than you need to study music to be moved by a song.

And just as a composer combines notes and phrases to form a musical composition, a choreographer combines these gestures with new movements to form expressive combinations.

Ballerinas play these combinations with precision, alongside a live orchestral score, to convey stories, emotions and character.

In the opening scene of "Sleeping Beauty," the fairy court presents gifts to the baby Princess Aurora in rapid succession.

The Generous Fairy walks delicately on her "en pointe" (meaning "on her toes") to the light flicking of the violin.

Ballerinas move in perfect harmony with the music, sometimes imitating violin trills with elegant boules.

The Fairy of Temperance, who gives Aurora the gift of strong will, is choreographed as if she shoots bolts of electricity from her fingers.

She hops around the stage, twirling on a nimble chain, then daring to hit the jete.

Some moves are even more literal than this.

The evil Fairy Carabosse curses the princess with a deadly 'X', and the benevolent Lilac Fairy counters the curse.

Of course, the relationship between music and movement is not always so simple.

Gestures in classical ballet often respond to musical elements, but the degree of collaboration between dancers and orchestra is also a choreographic tool.

Some characters and scenes move in sync to create rhythmic clarity, while others deliberately deviate from the orchestra.

Dancers and musicians maintain this delicate balance throughout each performance, engaging in a live negotiation of speed and rhythm.

But prior to performance, the most important relationship for ballet is between the choreographer and the music.

Choreographer Marius Petipa and composer Pyotr Ilyich Tchaikovsky collaborated on every moment of Sleeping Beauty.

This is especially noticeable in Princess Aurora's exuberant entrance for her 16th birthday.

Tchaikovsky's frenzied music starts rolling forward spasmodically, even shortening some musical phrases to capture her impatience.

Petipa choreographed Aurora bouncing back and forth in a "pas de chat" (French for "cat's step") while waiting for the party to begin.

Once the celebration begins, it's up to the dancers to deliver the physical spectacle of gracefully performing these movements.

Aurora has the hardest part. It's her famous Rose Adagio.

As four suitors vie for her hand, the princess exhibits a dizzying balance all on en pointe.

She takes each suitor's hand for a moment, but then balances unaided, displaying breathtaking strength and skill.

But it's not just technique that counts, it's style and personality.

Ballerinas can perform their movements to convey a wide range of emotions, much like an actor delivers a line.

Aurora has an elegant and reserved personality, capable of throwing out her arms independently from her suitors.

Alternatively, she can be shy and flirtatious and come down from impointe with grace and confidence.

"Sleeping Beauty" shows us a lot of what ballet can do.

Its graceful spectacle, dramatic physical vocabulary, and captivating harmony of music and movement perfectly reflect the themes of this fantasy romance.

But ballet isn't just for epic fairy tales.

Ballet can be an emotional journey without narrative, a deconstruction of an experimental form, or a demonstration of pure skill.

This art form is constantly experimenting with a set of centuries-old rules, making it the perfect medium for presenting stories old and new.

I'm a creative technologist with a focus on public facilities.

One of my driving forces is the idea of ​​exploring nature and trying to find hidden data in nature.

There seems to be this potential all around us.

Whether it's sound, smell, or vibration, everything emits some kind of data.

Through my work, I have tried to find ways to exploit and reveal this.

And this basically led me to a subject called Cymatics.

Now, cymatics, as we see it, is basically the process of visualizing sound by vibrating a medium such as sand or water.

So let's take a quick look at the history of cymatics, beginning with observations of resonance by da Vinci, Galileo, British scientists Robert Hooke, and Ernest Cladoni.

He created an experiment using a metal plate, covered the plate with sand and then drew a bow to create the Chladni pattern seen to the right.

The next to explore this field was a gentleman called Hans Jenny in the 1970s.

In fact, he coined the term cymatics.

And it's my collaborator and cymatics expert, John Stewart Reed, who brings us to the present day.

He kindly recreated Chladni's experiment.

What we see here is a sheet of metal, this time connected to a sound driver and fed by a frequency generator.

As the frequency increases, the pattern that appears on the plate also becomes more complex.

so that you can see it with your own eyes.

(Applause.) So what excites me about Cymatics?

Well, to me cymatics is almost a magical tool.

It is like a mirror into hidden worlds.

Through the many ways in which cymatics can be applied, we can really begin to reveal the nature of the unseen.

Devices like the cymascope you can see here are used to scientifically observe cymatic patterns.

And the list of scientific applications grows every day.

For example, in oceanography, a dictionary of dolphin languages ​​has actually been created, essentially by visualizing the sonar beams emitted by dolphins.

And I hope that in the future we will have a better understanding of how they communicate.

Cymatics can also be used for healing and education.

This is an installation developed with elementary school students to track their hands. This allows you to control and position the cymatic pattern and the reflections it causes.

Cymatics can also be used as a beautiful natural art form.

This image was created from a portion of Beethoven's Ninth Symphony played through a cymatic device.

So it's kind of like turning things upside down a bit.

This is Pink Floyd's 'Machine' being played in real time through a Cymascope.

Cymatics can also be used as a mirror in nature.

And we can actually reproduce the archetype of nature.

For example, here on the left we see snowflakes as they appear in nature.

Then on the right you can see the cymatically created snowflakes.

And here is the starfish and the cymatic starfish.

And there are thousands of these.

So what does this mean?

Well, in the early stages there is still a lot to explore. And there are not that many people working in this field.

But let's think for a moment that sound has a shape.

We have seen that it can affect matter and cause forms within matter.

Then let's take a little leap and think about the formation of the universe.

And think about the huge sound the universe is forming.

And if you think about it for a second, perhaps Cymatics influenced the formation of the universe itself.

Here are some eye-pleasing creations from various DIY scientists and artists around the world.

Cymatics is open to everyone.

I encourage all of you here to apply your passion, knowledge and skills to areas like cymatics.

We believe that together we can build a global community.

We can inspire each other.

And we can evolve our exploration of the nature of the invisible. thank you.

(applause)

"I'm 14 and I want to go home."

"My name is Beth, I'm here for you, tell me more."

"I've run away before, but I've never been involved in something like this.

I think they put drugs in my liquor. ”

"It sounds like you don't feel safe.

The quickest way I can get you help is by calling 911. ”

"Laughter, Beth.

If they listen to me, they will kill me.

They are about to send another man to have sex with me, please hurry. ”

"Okay, looks like we're in danger.

Call 911 to send help.

you are very brave ”

"Thank you, Beth.

These guys are armed, so tell the police to be careful. ”

This story was widely reported in the national press, so I'm sharing it with you.

We called 911.

Police rescued the girl and two other girls from a San Jose Motel 6 and arrested the three men.

My name is Nancy "Beth" Lublin.

I am the co-founder and CEO of Crisis Text Line. Crisis Text Line is a free 24/7 text and messenger service for people with mental and behavioral health issues.

And when I take the stage as a crisis counselor, I use the alias "Beth."

I happen to be the crisis counselor who responded to the conversation.

But this is what Crisis Text Line is all about.

It is the strangers who keep us alive in our darkest moments, make us feel less alone, and remind us of how strong they are.

Crisis Text Line quietly launched in Chicago and El Paso in August 2013 and within four months had access to all 274 US area codes. Because people used the service, had a great experience and shared it with their friends. This is natural growth.

Six and a half years later, it has now processed about 150 million messages.

People who use our free 24/7 service are skewed towards young people. Being a text, it is biased toward young people.

45 percent are under the age of 17.

It is also poor and racially diverse.

17 percent identify as Hispanic and 44 percent are LGBTQ.

The top five problems we see are relationship, depression, anxiety, and self-harm, and about 1 in 4 conversations include suicidal ideation.

Everyone who texts us is unhappy, but the satisfaction rate from text messagers is usually around 86%.

What's so good?

Technology, data and people.

So technology.

It's not an app.

It's not something you have to download.

It's free, and there's no troublesome intake questionnaire, so it's very easy to use.

Just send a text message.

Uses machine learning to stack rank queues based on severity.

It's like a hospital emergency room tending to a gunshot wound before a child with a sprained ankle.

We work in the same way.

Therefore, the high-risk cases are addressed first.

Therefore, the person who swallowed the bottle of pills will come before the others.

This is data science to save lives.

But counseling is human.

We have trained over 28,000 volunteer crisis counselors to date. They apply online, undergo a background check, and undergo about 30 hours of training.

And if you pass—not everyone does, only 33% pass—you can save a life from your couch.

This is the new gig economy for volunteering, like Uber and Lyft for volunteering.

We also have full-time staff with master's degrees in related fields.

They are supervisors, monitoring every conversation and intervening when necessary.

Thanks to this technology and data and our volunteer work model, we are able to reach out to many in need.

People who do not have access to other resources, such as gay teenagers who cannot share information with their parents because they keep telling them to pray that they will be gone.

Or a girl who can't sleep at 2am because she's worried about the finals and doesn't want to disappoint the people who love her.

So they text us.

and we love them.

And we support them and remind them how strong they are.

And together we develop a plan to ensure safety.

And we tell them, if this makes you feel good, please share with us. And 68 percent said they have shared something with us but never with another human being.

And after our conversation, they put that safety plan in place.

And maybe they will go to sleep.

Or write a diary.

Or listen to BTS or Lizzo, or write a letter to your sister, boss, or yourself to read in 12 months.

they stay safe.

Sometimes people have thoughts, plans, means, and timings that hurt themselves and others, but we are unable to de-escalate.

Like the man in Texas five years ago on Christmas Eve who told us that he only felt pleasure when he inflicted pain and that he wanted to kill a woman and was going to do so that night.

Call 911 in imminent danger.

And I am grateful for 911. In the Texas case, as reported in the news, they actually sent help and sent the police to his house, and they found him with a loaded armory and on record as being in possession of a human leg.

Today, active rescue talk makes up less than 1 percent of our conversation.

Still, about 26 times per day.

And six of them in a week are homicides.

Typically school shooters.

We have now completed over 32,000 active rescues.

Our own data and external research show that we are very good at saving and changing lives.

We use data to enable system changes.

For example, we've learned that the best way, the best word, to assess risk for suicidal ideation is not to use the words "Are you thinking about suicide?"

Instead, use words like "Are you thinking about death or dying?"

Or "Are you thinking of committing suicide?"

And now we have shared that wording with journalists for adoption.

We have shared the words with activists.

We advise the National Emergency Numbers Association, the 911 Association, on best practices for suicide first responders.

We also work with the Veterans Administration to identify suicidal thoughts and intentions in veterans.

(sighs) Pain is not a uniquely American experience.

It's a human experience.

That's how we've grown.

So far, we've expanded one country at a time: Ireland, the UK, and Canada. I did this in both French and English.

And we can continue to grow one country at a time.

And it will take decades to reach just one-third of the world's population.

And it is never accepted.

Since the start of COVID-19 in early March, our trading volume has already increased by 40%.

78% of our conversations contain words like "surprised," "scary," and "panicked."

As people worry about the novel coronavirus, they are nervous about symptoms and worry about their families who are working on the front lines.

We can also see the effects of the quarantine itself.

People are separated from their daily lives and possibly in isolation with abusive people.

Thus, sexual abuse increased by 48 percent and domestic violence increased by 74 percent.

One of the biggest effects of the virus and lockdowns that we have seen so far is economic stress.

More and more people are coming to us with fear of bankruptcy, homelessness or other financial ruin.

And today, 32% of text messagers identify their household income as less than $20,000.

This is up from our typical low income of 19%.

Therefore, we need to grow.

We've been planning to announce language-specific expansion for months. Over the next five years, we will expand to five languages ​​and cover 32% of the world.

And then the novel coronavirus emerged.

Things have changed.

And now five years feels like a luxury.

So today we are working on doing it in half the time.

Five languages ​​in two and a half years.

Are you going to turn on Spanish everywhere, English everywhere, Portuguese everywhere, French everywhere, and a fifth language?

Arabic.

So we will continue to serve countries and people with limited mental health services and little data about what is happening.

These include immigrants with phones.

Young people are also often not included in studies, but they do have phones.

So we plan to move to language. This makes the technology easier, as you'll be using WhatsApp and Messenger in addition to text.

Our global reach also helps with late night capacity as we can cover time zones.

Think about it, this will help strangers all over the world.

It's like a gigantic global love machine.

And the fact that the TED community supports our bold dreams means so much to me and everyone on our team.

And the best way we show our appreciation is by telling them we are ready and motivated.

And we will use this support to impact the lives of millions of people around the world.

It's a tough time.

And it's confusing, depressing, and can make anyone feel alone, especially in lonely situations.

But no matter your age, your situation or where you live, we're right in your pocket.

Over the past few weeks, I've been thinking a lot about that trafficked girl I was involved with.

And I hope she's somewhere safe.

don't know ...

I don't know how she's been quarantined or who she's with, but I hope she's okay.

And I don't know how she knew our phone number last year, or even how she had access to a phone to contact us.

I never asked her.

Because it didn't matter.

What mattered was that she could reach us, that she had it, and that we could get her help right away.

And that's the goal, to make it easier for people to get help, not avoid it.

It means that no one is ever alone, even in moments of difficulty, danger and physical distance.

None of us are really alone thanks to Crisis Text Line.

[Please support this effort at AudaciousProject.org]

I am very excited to have the opportunity today to share with you what I consider to be the greatest stunt on the planet.

Or maybe it doesn't exist on Earth.

A parachute jump from the edge of space.

More on that in a bit.

The first thing I want to do is give you a very short helicopter tour of the stunts and the stunt industry in film and television and how technology is starting to work with the physical skills of the stunt performers to make the stunts bigger and actually safer than ever before.

I have been a professional stuntman for 13 years.

Stunt coordinator. In addition to performing stunts, he often designs stunts as well.

During that time, health and safety became my whole job.

It is now very important that it is the crew, not just the stuntman, who can ensure safety in the event of a car accident.

I can't kill the cameraman. You can't kill a stuntman.

We cannot kill or injure passers-by on filming sites. So safety is everything.

However, this was not always the case.

In the old days of silent movies, Harold Lloyd, famous for hanging from clock hands, did their own stunts. They were very remarkable.

They had no security and no real technology.

The security they had was very poor.

Here is the first stuntwoman, Rosie Venger, an amazing woman.

As you can see from the slide, it's very powerful.

She really paved the way at a time when no one was doing stunts, let alone women.

My favorite and true hero is Yakima Kanat.

Yakima Kanat really formed a stunt fight.

He worked with John Wayne and most of the old punch-ups you see in westerns. Either Yakima was there or he coordinated the stunt.

Here's a screen capture of "Stagecoach" with Yakima Kanat doing one of the most dangerous stunts I've ever seen.

No safety equipment, no back support, no pads, no crash mats, no sand pits on the ground.

Indeed, this is one of the most dangerous horse stunts.

Let's talk about dangerous stunts and update a bit, some of the most dangerous stunts we do as a stuntman are fire stunts.

Without technology, they wouldn't have been possible.

These are especially dangerous since I don't have a mask on my face.

They were done for photography. One is The Sun Newspaper and the other is FHM Magazine.

It's very dangerous, but you'll also notice that it looks like you're not wearing anything under your suit.

The old fire suits, bulky suits and chunky wool suits have been replaced with modern materials like Nomex and more recently Carbonex. Great material that allows us stunt pros to burn longer, look better and burn completely safely.

I'll explain a little more here.

There's a guy there with a flamethrower, what did you give it to me for?

One of the things stuntmen do all the time, as you always see in big movies, is blow air.

Well, I used to play the trumpet. In the old days that was all.

And it's a slope. Jump off things and fly through the air, hopefully looking good.

Now we have technology. This is called an air ram.

This is a terrifying piece of equipment for novice stunt performers. A wrong landing can easily break your leg.

That said, it works using compressed nitrogen.

and it is in the top position. Stepping on it with remote control or foot pressure fires it at a range of 5 feet to 30 feet, depending on gas pressure.

You could literally dive into the gallery.

You probably don't want that.

Not today.

Car stunts is another area where advances in technology and engineering have made our lives easier and safer.

Now you can do bigger car stunts than ever before.

Getting run over is never easy.

It's a classic, hard, grueling, physical stunt.

But we have padding, and we have great shock absorbers like Sorbothane, materials that help us not hurt as much when we get hit like this.

The photo on the bottom right is a dummy work for a crash test I was doing.

It really shows how stunts work in different disciplines.

And the test of the exit sign post.

One company is building a grid of pillars called latix pillars (networks) that collapse on impact.

The car on the left collided with an iron pole.

You can't see it from there, but the engine was in the driver's lap.

They did it remotely.

I drove the other car at 60 mph, exactly the same speed, and apparently walked away from it.

Car rollover is another area where technology is used.

I used to have to drive up the ramp and still do sometimes.

But now we have compressed nitrogen cannons.

Under the car, you can see black bars on the floor by the wheels of the other car.

It's a piston fired from the floor.

With a powerful enough nitrogen cannon, you can flip over trucks, coaches, buses, and anything else. (Laughs) It's a really great job. (laughs) It's a lot of fun!

You should be able to hear some of the phone conversations you have with other people in the store using Bluetooth.

"You can flip a bus, you can set it on fire. And what if someone makes a big explosion?"

And people look like this...

(Laughter) I forget how weird those conversations were.

The next thing I want to show you is what Dunlop asked me to do for Channel Five's "Fifth Gear Show" earlier this year.

The world's largest loop-the-loop.

Only one person has ever done it.

Now, the old stuntman's solution to this was, "Run as fast as you can. Sixty miles an hour.

Let's go with that. Keep your feet flat on the floor. ”

Well, if you do that, you'll die.

We went to the other university, the University of Cambridge, and spoke to a PhD in mechanical engineering, a physicist there, who told us it had to be 57 mph.

Still, I lost a little consciousness on the way after catching 7G.

One wrong step and it's a long way to fall. That's exactly what it was.

Again, science helps us. It also helps with engineering such as modding cars and wheels.

High waterfall, it's an old fashioned stunt.

What's interesting about falling from height is that they use airbags, and some airbags, although very advanced, are designed so that even if you land slightly wrong, you won't slide sideways like you did before. So they are safer suggestions.

It's basically basic equipment.

A bouncy castle with slats on the sides to allow air to escape.

It's just a bouncy castle.

That's the only reason we do. Look, it's all fun, this job.

What's interesting is that they still use cardboard boxes.

They used cardboard boxes years ago and we still use them.

And it's interesting because it's almost retrospective.

Great for catching up to a certain height.

And on the other side of the fence, the physical arts, the physical performance of stuntmen, are linked with cutting-edge IT technology. And in software too.

It's a green screen, not a cardboard box.

This is a scene from the movie "Terminator".

Two stuntmen doing what I think is a pretty benign stunt.

30 feet. it's water. It's very simple.

With a green screen, you can put any background in the world on top of it, whether it's moving or stationary. Now I can assure you that you can't see the seams.

This is a paratrooper with another paratrooper doing the exact same thing.

In a completely secure studio and with a green screen, you can create a video shot by a skydiver that incorporates the movement of the sky and the movement of clouds.

Reducer rigs and wires are often used.

This is how people fly with wires.

This guy isn't skydiving. He's flying like a kite, he's flying around like a kite.

And this is a Guinness World Records challenge.

They asked me to do a 50th anniversary show in 2004.

And thanks to the technology, thanks to the alloy we used in our descender device, we were able to rappel down over 100 meters at our fastest speed, stopping within a few feet of the ground, without the rope melting from friction.

That's Centerpoint in London.

We stopped Oxford Street and Tottenham Court Road.

Helicopter stunts are fun for anything, even hanging out of a helicopter.

and aerial stunts. Aerial stunts will never be the same without skydiving.

This very much explains why I'm here today: Project Space Jump.

In 1960 Joseph Kittenger of the United States Air Force did the most amazing thing.

He made jumps from 100,000 feet, 102,000 feet to be precise, and did so to test high-altitude systems for military pilots in a new range of aircraft that ascended to altitudes of 80,000 feet or so.

And I would like to show you a little video of what he was doing at that time.

And remember how brave he was in 1960.

It was called Project Excelsior.

I had three jumps.

They dropped some dummies first.

That's the balloon, the big gas balloon.

It is shaped like this because the helium needs to expand.

My balloon expands 500 times and looks like a big pumpkin when it's on top.

These are dummies that are dropped from 100,000 feet and have cameras fixed to them.

At that altitude, you can clearly see the curvature of the earth.

And we plan to go from an altitude of 120,000 feet, or about 32 miles.

In that environment of minus 50 degrees, it will be in a state close to a vacuum.

So it's a very hostile place.

This is Joe Kittenger himself.

Remember, folks, this was in 1960.

He didn't know whether he would live or die. This is a very brave man.

I spoke with him on the phone a few months ago.

He is a very humble and wonderful human being.

He emailed me and said, "If this thing ever gets off the ground, I wish you the best of luck." And he signed "Congratulations on landing". I thought it was very nice.

He is in his eighties and lives in Florida. he's a great guy

This is him in a pressure suit.

One of the challenges of ascent is when you reach an altitude of 30,000 feet. That's great, isn't it? -- At 30,000 feet altitude, only oxygen is really available.

Above 30,000 feet and closer to 50,000 feet, you'll need to pressurize in a G-suit.

Here he's wearing old rock'n'roll jeans and tucking in his flipped jeans.

A pressure suit is required.

A compression breathing system with a G-suit is required. Wearing a G-suit compresses your body, making it easier to inhale and exhale.

At altitudes above 50,000 feet, spacesuits and pressure suits are required.

Certainly no aircraft will fly at 100,000 feet.

Not even a jet engine.

You'll need to use either rocket power or giant gas balloons.

It took a while. It took years to find the right balloon team to build a balloon that would do the job.

I found that team in America now.

And it's made of polyethylene, so it's very thin.

Balloons are notorious for bursting on takeoff, so have 2 balloons for each test jump and 2 for the main jump.

They are really very delicate.

Here is step off. He wrote on the object "the highest step in the world".

And what does it feel like?

I feel excited and scared at the same time.

And this is the camera he was holding when he fell before the drogue chute opened to stabilize him.

Drogue chutes are small chutes that help keep you face down.

You can see it pop open there.

That's a drogue chute. he had three of them.

I did quite a lot of research.

And soon you'll see him back on the floor.

To explain how to look at this balloon, the little black dots are people.

Hundreds of feet tall. It's amazing.

It's New Mexico.

That's the United States Air Force Museum.

And they made a dummy of him. That's exactly what it was.

My gondola will be much simpler.

It's basically a three-sided box.

So I had to do a fair amount of training.

This was last year in the Atlas Mountains of Morocco, where I was training for a high jump.

Here's the view for me at 90,000 feet.

Now, you might think this is just a thrill-seeking trip, a scenic flight, or just the world's greatest stunt.

Well, there's a little more to this.

My search for a spacesuit to make this happen led me to an area of ​​technology that I never expected when I started.

I contacted a US company that makes suits for NASA.

That's my current suit. This was me and their chief engineer last year.

That suit would cost about $1.5 million.

It weighs 300 pounds, so you can't skydive.

That left me stuck. For the past 15 years, I've been looking for the right spacesuit for this job, or someone who could make one for me.

Not long ago, something revolutionary happened at the same facility.

That is the prototype of the parachute. I had only one original in the world made to order. And it is the only suit of its kind in the world.

It was made by the Russians who designed most of the suits for the Soviet Union over the last 18 years.

Like everyone else in the spacesuit industry, he left the company because he saw an emerging market for spacesuits for space travelers.

You know you can still get oxygen when you're in an airplane at 30,000 feet and the cabin is decompressed.

At an altitude of 100,000 feet, you die.

Loses consciousness within 6 seconds. You will be dead within 10 seconds.

your blood is about to boil It is called evaporation.

The body becomes swollen. It sucks.

And we expect that, but it's not very pleasant.

We anticipate, and others anticipate, that perhaps the FAA or CAA will say, "We need someone in an uninflated, aircraft-connected suit."

And like this nice big visor, it's comfortable and has good vision.

And even if the cabin is depressurized while the aircraft is landing, no matter what emergency measures are taken, everyone will be fine.

If Costa is here, I want to bring him in and show him the only thing of its kind in the world.

I was going to wear it, but I thought I'd let my lovely assistant Costa do it.

thank you. he is very hot Thank you Costa.

This is a communication headset found on many spacesuits.

It's a two layer suit. NASA's suit has 13 layers.

It's a very light suit. Weighs about 15 pounds.

It's almost nothing. Designed especially for me.

A working prototype. Used for all jumps.

Can you give me a spin, Costa?

thank you very much.

As you can see from the photo below, it doesn't look much different when inflated.

I have even skydived in a wind tunnel. This means you can practice everything you need to practice in safety before jumping off something. Thank you very much, Costa.

(Applause) Ladies and gentlemen, that's all for me.

My mission status at the moment still requires a major sponsor.

I am sure you will find it.

I think it's a great challenge.

And I hope you can agree with me too, this is the greatest stunt on the planet.

Thank you for the place busy.

(applause)

Australians call them 'runners' while British call them 'trainers'.

Americans call them "tennis shoes" or "sneakers".

Whatever the name, these rubber-soled casual shoes are worn by billions of people around the world.

Originally invented in the late 19th century, these simple canvas and rubber works have changed a lot since they first appeared on the pavement.

Today, sneaker consumption is at an all-time high.

No country buys more sneakers than the US, where they buy an average of three pairs per year.

To meet this demand, approximately 23 billion pairs of shoes are produced each year, mostly in factories in China and Southeast Asia.

However, shoe manufacturing has become more complex, labor intensive and, in some ways, more dangerous for the workers involved and for the planet.

Shoe manufacturing accounts for about one-fifth of the fashion industry's carbon footprint.

Sneakers alone produce 313 million tons of carbon dioxide each year, equivalent to the annual emissions of 66 million cars.

To better understand the carbon footprint of shoes, let's take a closer look at sneaker construction.

First, heels, insoles, midsoles, and upper layers are typically made from synthetic fibers such as polyester, nylon, latex, and polyurethane.

Mining the fossil fuels that make up these substances produces large amounts of greenhouse gases.

The processing of these raw materials into synthetic fibers also uses a large amount of energy, further exacerbating pollution.

Some sneaker tops are made from natural sources such as leather, but this material relies on chromium for tanning. A carcinogenic chemical that can damage freshwater ecosystems.

The outer sole of most shoes is made of rubber through a process called vulcanization.

This technique involves adding sulfur to superheated raw rubber to create a material that is both resilient and tough.

Until recently, sneakers used natural rubber for this process.

Today, however, most outer soles are made from a mixture of natural rubber and synthetic coal and petroleum by-products.

The production of these materials accounts for 20% of the sneaker's carbon footprint.

But more than two-thirds of a shoe's carbon impact comes from the next step: manufacturing.

A typical sneaker consists of 65 individual parts, each made on a dedicated machine.

This means that it costs less to mass-produce each part individually than for a factory to manufacture all the parts under one roof.

However, the transportation required to transport these parts to one assembly plant emits even more CO2.

Once the components arrive on the assembly line, they are cut, poured, melted, baked, cooled and glued together before the final product is stitched together.

More than 360 steps are required to assemble a typical sneaker, accounting for the remaining 20% ​​of the sneaker's environmental impact.

Dispersal of factories also raises another problem of labor abuse.

Since most brands do not own or operate factories, the factories they work with are located in countries with little or no labor protection laws.

As a result, many workers earn below a living wage and are exposed to harmful chemicals such as toxic glue fumes.

Once manufactured, the shoes are packed and shipped to stores around the world.

For many people, these shoes can last for years.

But if you run 20 miles a week, your running shoes will start to wear out in about six months.

Shoes are made of so many different materials that it's almost impossible to break them down into recyclable parts.

20% of these shoes are incinerated and the rest are dumped in landfills, where they can take up to 1,000 years to decompose.

So how do you balance your love of sneakers with your need for sustainability?

First, designers should streamline design elements and focus on eco-friendly materials.

Factories need to develop energy-efficient manufacturing processes that integrate step and sneaker components.

And consumers should support companies that use clean energy and ethical manufacturing processes.

You can also buy less shoes, wear them longer, and donate the shoes you no longer need.

So whatever your style, we can all take a step towards a sustainable future.

Helen Walters: So Chris, who gets up first?

Chris Anderson: Well, there is a man who has been worried about the pandemic for almost his entire life.

More than 40 years ago, he played a pivotal role in ridding the world of the scourge of smallpox.

And in 2006, he came to TED to warn the world about the terrifying risks of a global pandemic and what we can do about it.

Dr. Larry Brilliant, welcome.

Larry, nice to meet you.

Larry Brilliant: Thank you, nice to meet you.

CA: Larry, in that talk you showed a video clip that simulated what a pandemic would look like.

I'd love to play it, but hearing this horrified me.

Larry Brilliant (TED2006): Let me show you a simulation of what a pandemic might look like to see what we're talking about.

For example, let's assume that the first cases occurred in South Asia.

It goes very slowly at first and you get two or three separate positions.

Secondary infections then occur.

And the disease spreads from country to country so fast that you don't know what happened to you.

It will spread all over the world within 3 weeks.

If we had an 'undo' button, if we could go back and isolate and catch the infection when it started, if we could catch it early, detect it early, react early, put the virus in jail one by one, that's the only way to deal with something like a pandemic.

CA: Larry, the words "early detection" and "early action" that you mentioned there were a big theme in that talk, and you had all of us repeat it over and over.

Is it still the key to preventing a pandemic?

LB: Oh, sure.

When you have a pandemic, when something is going at an exponential speed, and you miss the first two weeks or are late to the first two weeks, you lose the peak two weeks, not the deaths and illnesses in the first two weeks.

Acting early can prevent them.

Early response is important, and early detection is a prerequisite.

CA: So how do you rate the world on early detection and early response to COVID-19?

LB: Of course, I've been asked this question before, so I've been thinking a lot about it.

I wanted to visit each country, so I actually made a list.

I think Taiwan, Iceland and of course the Island Republics of New Zealand will get A's.

The island republics of Great Britain and the United States – no matter how much we think of ourselves as islands – they are not islands – will be given a failing grade.

I give South Korea and Germany a B.

And meanwhile...

The whole world is stagnant.

We should not be proud of what is happening now.

CA: So we caught it pretty early, but at least some doctors in China caught it pretty early.

LB: With SARS in 2002, it took six months.

This took about 6 weeks.

And detection means not just finding it, but knowing what it is.

So I can give it a pretty good score on this point.

Transparency and communication are separate issues.

CA: So what's the big mistake you think the F'ed country has made?

LB: I think it's pretty human to have fear, political incompetence, interference, not taking it too seriously right away.

I think that throughout history, almost all pandemics have been initially viewed with denial and suspicion.

But countries that acted quickly, or countries that started late like South Korea, were still able to bounce back and did really well.

We spent two months lost.

We started two months ahead of the exponentially moving virus.

That's not a good idea, Chris.

CA: No, definitely.

In short, there is still a lot of cryptic information about this virus.

What do you think the final scientific consensus will be on two key numbers: infectivity and lethality?

LB: So I think the equation to keep in mind is that viruses depend on three main issues to operate.

One is R0, the number of secondary infections that initially occur when the virus emerges.

In this case, people say 2.2, 2.4.

But three weeks ago a very important paper was published in the "Emerging Infectious Diseases" journal, suggesting that looking back at Wuhan data, it was actually 5.7.

So, for the sake of discussion, let's assume that the virus is traveling at an exponential speed, with an exponent between 2.2 and 5.7.

Two other factors that are important are latency or generation time.

It seems to us that the longer it goes on, the slower the pandemic progresses.

When it's really short, like six days, it goes like lightning.

And last but not least, and often overlooked, is the density of susceptible people.

Since this is a new virus, we would like to know how many customers it could potentially cause.

And this is new, it's our 8 billion people.

The world is facing a virus that we are all equally susceptible to.

It doesn't matter our skin color, race or wealth.

CA: So the numbers you've been referring to are no different than any other epidemic of recent years.

What combination made this so deadly?

LB: Well, it's just a combination of short incubation period and high infectivity.

But you know, everyone on this call knows someone who has this disease.

Sadly, many have lost loved ones.

This is a terrible disease when it gets serious.

And I get calls from emergency room doctors and intensive care unit doctors all over the world, and they all say the same thing.

I have too few tools to work with. ”

Dying alone with a ventilator in your lungs is a terrible disease, a disease that affects all of our organs.

It's a respiratory disease - perhaps misleading.

Reminds me of the flu.

But so many patients have hematuria from kidney disease, they have gastroenteritis, and indeed they frequently have heart failure, and we know that it affects taste, smell, olfactory nerves, and of course the lungs.

My question is, are there organs that are not affected?

In that sense, I am very reminded of smallpox.

CA: So we're confused.

Where do we go from here?

LB: Well, the path is still the same.

Fast detection, fast response.

Find every case and know every contact.

We have great new technology for contact tracing, and we have great scientists working at the speed of light to bring us testing kits, antiviral drugs, and vaccines.

Buddhism says we need to slow down, let time slow down and pour our hearts and souls into that space.

We are social distancing because we need to slow down this virus.

Mind you, flattening the curve and social distancing will not change the absolute number of infected people, but will turn the Mt. Fuji-like peak into a pulse. That way, people won't be lost in a war for hospital beds, people who have had heart attacks, people who need chemotherapy, people who have difficult labor can be hospitalized, and scarce resources, especially in developing countries, can be used to treat people.

So slow down the epidemic, hop on, step back, stomp in the trough, find every infected person, trace every contact, test every case, quarantine only those who need to be quarantined, and so on until we have a vaccine.

CA: So it sounds like we need to go beyond just mitigation where we're trying to generalize closure and then start identifying individual cases again, start contact tracing, and get to the point where we can treat them individually.

So it looks like it will take a step up in coordination, ambition, organization and investment to make it happen, something that some countries are not yet showing signs of.

Can this be done, how can I do it?

LB: Oh, of course you can.

So Taiwan was very beautiful, Iceland was very beautiful, Germany was all different strategies, and so was South Korea.

What we really need is good governance, seriousness, and listening to scientists, not politicians chasing the virus.

Of course you can do this too.

I want to remind everyone, this is not a zombie apocalypse, nor is it a mass extinction event.

98, 99 percent of us will get out of this situation alive.

We have to deal with it the way we know we can and we have to be the best versions of ourselves.

Both at home and in science, and certainly in leadership.

CA: And are there likely to be even worse pathogens in the future?

For example, can you imagine or explain an even worse combination of these numbers that we should start preparing for?

LB: Well, smallpox had an R0 of 3.5 to 4.5, so I'm guessing this is about the same for COVID-19.

However, it killed a third of the population.

But we had the vaccine.

So these are the different sets you have.

But what worries me the most is why did we create "Contagion" and was it a fictional virus? Again for everyone watching, it's fiction.

We created a virus that will kill far more people than this one.

CA: You're talking about the movie "Contagion" that's being talked about on Netflix.

And you were the advisor.

LB: Certainly, yes.

But we intentionally made that movie to show what a real pandemic is like, but chose a virus that's pretty terrifying.

From bats to apples to pigs to cooks to Gwyneth Paltrow, I've made it look like this because in nature that's what we call spillovers, just as zoonotic and animal diseases spread to humans.

And if we look back 30 years, or look back 30 years, Ebola, SARS, Zika, swine flu, bird flu, West Nile, etc., we can almost start catechism and listen to all the cacophony of these names.

However, there were 30 to 50 types of new viruses that jumped into mankind.

And looking to the future, I wonder if we are entering an era of pandemics and we need to act like that, practice One Health, understand animals, the environment, and that we live in the same world, and get rid of the fiction that we are some kind of special species.

For viruses, we are different.

CA: Hmm.

You also mentioned vaccines.

Do you think there is an accelerated path to vaccine development?

LB: Yes.

In fact, it's really exciting to see us doing things that only computer science can think of. It is rather multiple sequential processes changing what always should have been, or rather always was.

Test safety, then test effectiveness, then test efficiency.

And you manufacture.

We are doing all three or four of these steps in parallel rather than in sequence.

Bill Gates said he doesn't know what the final vaccine will be, but he plans to build seven vaccine production lines in the United States and start preparing them for production.

Safety and efficacy studies are conducted simultaneously.

I think the NIH is up and running.

I am very excited to see it.

CA: And how do you see that translate into the expected timeline?

1 year and 18 months, is that possible?

LB: As you know, Tony Fauci is our guru on this issue, and he said 12 to 18 months.

I think it will be faster than the first vaccine.

But you may have heard that this virus may not give us long-term immunity like smallpox.

So we're trying to make vaccines with adjuvants that actually produce better immunity than the disease, so they can provide immunity for years.

It will take a little longer.

CA: Last question, Larry.

Back in 2006, as a TED Award winner, we got your wish. I wanted the world to build this pandemic preparedness system to prevent something like this from happening.

We feel like the world is letting you down.

If you could make one more wish now, what would it be?

LB: Well, I don't think we're disappointed in terms of speed of detection.

Quite satisfied, actually.

When we encountered these viruses on average in 2006, they were jumping from animals to humans, and it took us six months to discover it. Like the first Ebola, for example.

We are now discovering the first case in two weeks.

I have no complaints about it. I would like to reduce the incubation period to one time.

That's a bigger issue for me.

What I discovered was that the smallpox eradication program attracted people of all colors, all religions, all races, and so many nationalities.

And we needed to work together as a global community to overcome the global pandemic.

Now we feel that we are victims of centrifugal force.

We are in a nationalist barricade.

We cannot overcome the pandemic unless we believe that we are all working together to tackle it.

This is not an Age of Aquarius or Kumbaya statement, but what the pandemic forces us to recognize.

We are all working together and we need global solutions to global problems.

I can't think of anything less.

CA: Thank you very much, Larry Brilliant.

LB: Thank you Chris.

In 1905, psychologists Alfred Binet and Théodore Simon devised a test for struggling children in French schools.

That method, designed to determine which children needed individual attention, became the basis for IQ testing.

Since the late 19th century, researchers have hypothesized that cognitive abilities such as verbal reasoning, working memory, and visuospatial skills reflect underlying general intelligence (the G factor).

Simon and Binet designed a series of tests that measure each of these abilities and combine the results into a single score.

Questions were tailored to each age group, and a child's score reflected how they performed compared to other children of the same age.

Dividing someone's score by their age and multiplying the result by 100 gives their Intelligence Quotient, or IQ.

A score of 100 now represents the mean of the sample population, with 68% of the population scoring between 100 and 15.

Simon and Binet believed that the skills evaluated on the test reflected general intelligence.

However, there is no single, agreed-upon definition of general intelligence, then or now.

That leaves open the possibility that people will use preconceived notions about intelligence to take advantage of the test.

What began as a way of identifying people in need of academic help was soon used to categorize people in other ways, often exploited to deeply flawed ideologies.

One of the first large-scale introductions was in the United States during World War I, when the military used IQ tests to sort recruits and select them for officer training.

At the time, many believed in eugenics, the idea that desirable and undesirable human genetic traits could and should be controlled through selective breeding.

There were many problems with this idea, among which was the idea that intelligence is not only fixed and inherited, but also related to a person's race.

Under the influence of eugenics, scientists used military-led outcomes to falsely claim that certain racial groups were intellectually superior to others.

It created a false hierarchy of ethnic groups, ignoring the fact that many of the recruits tested were new immigrants to the United States with no formal education or English.

The intersection of eugenics and IQ testing has influenced policy as well as science.

In 1924, Virginia enacted a policy allowing forced sterilization of people with low IQ scores, and the U.S. Supreme Court upheld this ruling.

In Nazi Germany, the government allowed the murder of children because of their low IQ.

After the Holocaust and the civil rights movement, both moral and scientific grounds challenged the discriminatory use of IQ tests.

Scientists have begun collecting evidence of the impact of the environment on IQ.

For example, IQ tests have been regularly recalibrated over the 20th century, so that newer generations consistently scored higher on older tests than each previous generation.

This phenomenon, known as the Flynn effect, happened too quickly to be caused by inherited evolutionary traits.

Rather, it is thought that the cause lies in the environment, such as improved education, improved medical care, and improved nutrition.

In the mid-20th century, psychologists also attempted to use IQ tests to assess things other than general intelligence, particularly schizophrenia, depression, and other mental illnesses.

These diagnoses were partially dependent on the clinical judgment of the rater and used a subset of the tests used to determine IQ. This was found in later studies to yield no clinically useful information.

Today, IQ tests employ many of the same design elements and question types as earlier tests, but better techniques exist for identifying potential biases in tests.

It is no longer used to diagnose mental illness.

However, the equally problematic technique of using subtest scores is still sometimes used to diagnose learning disabilities, contrary to the advice of many experts.

Psychologists around the world still use IQ tests to identify intellectual disabilities, and the results can be used to determine appropriate educational, job training, and life support.

IQ test results have been used to justify fearful policies and scientifically unfounded ideologies.

That doesn't mean the tests themselves aren't worth it. In fact, the test does a good job of measuring purposeful reasoning and problem-solving skills.

But it is different from measuring a person's potential.

IQ tests involve many complex political, historical, scientific and cultural issues, but a growing number of researchers agree and reject the notion that individuals can be categorized by a single numerical score.

In early 1828, Sojourner Truth approached a grand jury in Kingston, New York.

She had no experience with the legal system, no money, and no power in the courts.

Ignoring the jury's contempt, Truth said she came to fight for custody of her 5-year-old son Peter, who was illegally sold to slave traders in Alabama.

As the trial dragged on for months, Mr. Truth raised money, strategized with his lawyers, and stood by his convictions.

In the spring of 1828 Peter finally returned to her care, but Truth's work was not yet done.

She would devote the rest of her life to the pursuit of justice and spiritual understanding.

Truth was born Isabella Baumfrey in Ulster County, New York in the late 18th century to a slave family.

New York State had announced the abolition of slavery in 1799, but the Emancipation Act was phased out.

Those currently enslaved were forced into indentured servitude until their mid-twenties.

Throughout this period, slavers repeatedly sold off Baumfree and separated her from her loved ones.

In many cases, she was clearly prevented from pursuing new relationships.

Eventually, she married a slave man named Thomas and had three children.

She was desperate to keep her new family together, but slow progress in abolition threatened this hope.

Baumfrey was enslaved by John Dumont, who promised to free her by 1826.

After he failed to keep his word, Ms. Baumfrey fled to her safety.

While on the run, she was only able to rescue her youngest daughter, Sophia, while her other children remained in custody.

It would be two years before she regained custody of Peter.

She then waited another two years to see her other children.

During this time, Baumfrey found solace in his faith and devoted himself more and more to religious speculation.

After settling in Kingston, New York, she joined a community of Methodists who shared their political views.

She continued her habit of speaking aloud to God in secret, and one night her evening prayers took on even more sacred meaning.

Baumfrey claimed to have heard a voice from God telling him to leave Kingston and pass on a divine message to others.

Baumfrey never learned to read or write, but he became known as a moving orator who drew upon biblical references, spiritual ideals, and the experience of slavery in his speeches.

Her sermons condemned the oppression of African Americans and women in general, and she gained prominence in her campaigns for both the abolition of slavery and women's rights.

In 1843, she renamed herself Sojourner Truth and embarked on a legendary speaking tour.

Truth viewed her journey as a mission from God.

Because of her faith, she often traveled to the most hostile areas of the country, where she spoke to bigoted audiences as the only black woman in the crowd.

Truth was confident that God would protect her, but some of the crowd reacted violently to her bravery.

During her sermon, a crowd of white men threatened to set fire to the tent in which she was speaking.

In his memoirs, Truth recalls bracing himself to face them:

And they were so big that my body could hardly support them. ' She soothed the men with songs and prayers until they stopped trying to harm her.

Truth's speeches touched thousands of people in communities across the country, but her work went far beyond public speaking.

During the Civil War, she was involved in the Union Army, recruiting soldiers and organizing supplies for black troops.

Her work was greatly appreciated and she was invited to meet President Lincoln.

She used this opportunity to argue that all former slaves should be given land by the government.

Truth continued to travel and lecture well into his eighties.

Until her death in 1883, she remained an outspoken critic, fighting for her right to be heard in a hostile world.

As Truth once said, "I feel safe in the midst of my enemies, because truth is powerful and it always wins."

Can you guess what you're looking at?

Fluffy socks? Overripe bananas? A tube of moldy toothpaste?

In fact, this is a humble sea cucumber whose daily toil, as strange as it may seem, paves the way for the prosperity of the entire ecosystem.

Sea cucumbers are members of the phylum Echinodermata, along with sea urchins, starfish, and other radially symmetrical "spiny-skinned" marine invertebrates.

Some sea cucumbers have wing-like tentacles extending from their mouths, others inflate like inflated balloons, and others simply look like headless chicken monsters. This sea cucumber is the actual name given to a deep-sea rarity.

However, they are generally characterized by a long cylindrical shape.

The sea cucumber is essentially a brainless, fleshy form that surrounds the digestive tract and is lined with a mouth and anus.

It has sticky tube legs that run the length of its body, allowing it to follow the ocean floor.

Special tube feet can be used for feeding and breathing, but many sea cucumbers actually breathe through their anus.

It rhythmically contracts and relaxes muscles to force water in and out of internal lung-like structures called respiratory trees that extract oxygen from seawater.

Certain species of crabs and pearl oysters take advantage of this rhythmic behavior, trembling and escaping inside when the sea cucumber's anus expands.

A single sea cucumber's rump can house up to 15 pearlfish at one time.

However, not all sea cucumbers seem to tolerate this invasive behavior.

Some species have five teeth around their anus, suggesting they may have taken an evolutionary stance on unwanted guests.

However, even sea cucumbers without anal teeth have tools to protect themselves.

They use mutable collagen tissue (MCT) to fend off threats and launch counterattacks.

This gel-like tissue contains bundles of collagen called "fibrils." Proteins can interact with these fibrils, causing them to slide against each other and stiffen the tissue, or apart to soften the tissue.

This versatile tissue has many benefits. It aids in efficient locomotion, allows sea cucumbers to fit into tight spaces, and allows asexual reproduction by dividing.

But the most explosive use of MCT is when predators attack.

By loosening internal tissue attachments and rapidly softening and contracting muscles, many species are able to shoot a wide range of organs from their anus.

This act is called "gut evacuation" and is a surprisingly effective defense mechanism.

In addition to frightening and distracting predators, the internal organs of some sea cucumber species are sticky and poisonous.

Gut removal may seem dramatic, but sea cucumbers can regenerate what they lost in the gut reaction in just a few weeks.

With the exception of a few species that have evolved to swim and feed without moving, many of these pesky creatures spend their time grazing on the ocean floor.

Sea cucumbers can be found everywhere from shallow shores to deep trenches 6,000 meters below sea level.

In the deep sea floor, they constitute the majority of animal biomass, reaching up to 95% in some regions.

As these magical sausage-shaped creatures plod, they soak up sand, digest the organic matter contained in the sand, and excrete by-products.

In this process, sea cucumbers cleanse and oxygenate the seafloor by breaking down detritus and recycling nutrients.

This creates conditions for seagrass beds and shellfish to thrive.

Sea cucumber excrement also aids in coral formation and may play a role in mitigating acidification of the marine environment.

As ocean cleaners, sea cucumbers do their job very well. About half of the sandy seabed is thought to have passed through the sea cucumber's digestive tract.

So the next time you're enjoying the crunch of sand between your toes, think about this. That grain of sand itself may have been expelled at some point by a pickle breathing out its butt.

For the most part, art and science stare at each other across the rift of mutual understanding.

When the two stare at each other, great confusion arises.

Of course, art looks at the world through the mind, emotions, sometimes the unconscious, and of course aesthetics.

While science tends to see the world through something rational and quantitative—that which can be measured and explained—science gives art a wonderful background of understanding.

At Extreme Ice Survey, we are dedicated to merging art and science in order to bring together two parts of human understanding, a deeper understanding of our relationship with nature and humanity.

Specifically, as a professional nature photographer all my adult life, I strongly believe in the tremendous power of photography, video and film to help us understand and shape the way we think about nature and how we think about ourselves in relation to nature.

In this project, of course, I am particularly interested in ice.

I am fascinated by its beauty, its mutability, its adaptability, and the wonderful shapes it can sculpt itself.

These first images are from Greenland.

But ice has another meaning.

Ice is the canary of the world's coal mines.

This is the place where you can see, touch, hear and feel climate change in action.

Climate change is very abstract in most parts of the world.

Believe it or not, it's based on how much or how little rain you feel.

Are you getting hot or are you getting cold?

What does the model of the computer tell us about this or that or anything else?

Let's strip it all down. In the world of arctic and alpine environments ice exists, it is real and it exists.

Change is happening. It stands out very much.

You can take photos. they are measurable.

95% of the world's glaciers are retreating or shrinking.

It's outside Antarctica.

95% of the world's glaciers are retreating or shrinking because of changing precipitation and temperature patterns.

There is no serious scientific controversy about it.

It is observed, measured and explosion proof information.

And the great irony and tragedy of our time is that much of the public thinks science is still arguing about it.

Science does not discuss it.

In these images, we can see ice from giant glaciers, ice sheets hundreds of thousands of years old breaking up into chunks, changing chunk by chunk, iceberg by iceberg, and turning into global sea level rise.

After seeing all this in my 30-year career, I was still skeptical about climate change a decade or so ago. I thought the climate change story was based on computer models.

I didn't know that it was based on specific measurements of paleoclimatism, or what ancient climates were like, such as paleoclimate recorded in ice sheets, deep-sea sediments, lake sediments, tree rings, and many other methods of measuring temperature.

When I realized that climate change is real and not based on computer models, I decided that one day I would do a project to photograph climate change.

And that led to this project.

Initially, I worked for National Geographic, traditional single-frame still photography.

Then one day I had the idea that I should take a time-lapse photo after the assignment. I had the idea that we should put a camera or two on the glacier and have them shoot every 15 minutes, or every hour, whatever, and watch the landscape change over time.

Well, within about three weeks, I recklessly turned that idea of ​​two time-lapse cameras into 25 time-lapse cameras.

And the six months that followed were the most challenging of my career, designing, building, and deploying these 25 time-lapse cameras in the field.

They are powered by the sun. A solar panel provides power.

Power goes into the battery. There is a custom-made computer that tells the camera when to fire.

These cameras are then placed on the rocks on the flanks of the glacier, looking into the glacier from a permanent position on the bedrock and observing changes in the terrain.

A number of cameras have been installed on the Greenland ice sheet.

We actually drilled well below ice melt level and have been installing a few cameras over the past month and a half or so.

Actually, I still have a camera.

In any case, the camera shoots almost every hour.

Some people shoot every 30 minutes, every 15 minutes, every 5 minutes.

This is a timelapse of one of the timelapse units we are creating.

(Laughter) I personally stuck with the nuts, bolts and washers for all of these crazy things.

During the first few months of building these units, I spent half my life at the local hardware store.

We conduct research in most of the major glacial regions of the Northern Hemisphere.

Our time-lapse units are located in Alaska, the Rockies, Greenland and Iceland, and we have recurring locations in British Columbia, the Alps and Bolivia that we visit every year.

It's a big business. I stand before you tonight as an ambassador for the entire team.

Many people are working on this now.

Currently there are 33 cameras.

We had 33 cameras all over the northern hemisphere about 30 minutes ago watching what happened.

And we've spent a lot of time in the field. It was an amazing amount of work.

Two and a half years have passed since we started our activities, but there are still two and a half years left.

That's only half our job.

The other half of our job is to tell this story to people around the world.

As you know, scientists have collected this kind of information off and on for many years, much of it staying within the scientific community.

Likewise, many art projects remain in the art community, and I feel a great responsibility to influence policy as much as possible about these photographs, through mechanisms like TED, and as I do with President Obama, the Senate, and John Kerry.

we made a movie we made a book There are more.

We have a site on Google Earth that Google Earth has generously donated to us. Because we feel a strong need to tell this story because it is the immediate evidence of ongoing climate change.

Now, before we talk about visuals, let's get a little scientific.

If everyone in the developed world understood this graph and flaunted it on their foreheads, there would be no more public debate about climate change because it matters.

All else you hear is just propaganda and confusion.

Key issue: This is a record spanning 400,000 years.

This exact same pattern can be seen dating back nearly a million years from now.

And some things are important.

For one, atmospheric temperature and carbon dioxide rise and fall essentially in sync.

You can tell by the orange and blue lines.

Nature naturally tolerates carbon dioxide up to 280ppm.

That's the natural cycle.

It goes up to 280, but goes down for various reasons not important to discuss here.

But 280 is the peak.

Looking at the upper right portion of the graph now, it is 385 ppm.

We are far outside the normal natural fluctuations.

The earth has heat.

Over the past 100 years, the Earth's temperature has increased by 1.3 degrees Fahrenheit and 0.75 degrees Celsius, and it will continue to rise as we continue to dump fossil fuels into the atmosphere.

Occurs at a rate of approximately 2.5ppm per year.

It has grown steadily and relentlessly.

We have to turn it around.

That's the core, and I hope to someday hang it in Times Square, New York, and many other places.

Anyway, to the ice world.

We are now at the Columbia Glacier in Alaska.

This is the so-called delivery face.

This is what one of our cameras has seen over the months.

Cameras capture hourly footage of the glacier pouring in from the right side and falling into the sea.

If you look at the background in the center, you can see her face in labor bobbing up and down like a yo-yo.

That means that glaciers are floating and unstable, and the effects of that floating will be visible in the future.

To give you a little sense of scale, that calf face in this photo is about 325 feet tall. That's 32 episodes.

This is no small cliff. It feels like a big office building in the city center.

The dividing plane is the visible wall of ice breaking, but it is actually thousands of feet below sea level.

This means that if a glacier is grounded on bedrock, a wall of ice thousands of feet deep will reach the bedrock, otherwise it will float.

Here's what Columbia did. It is located in south central Alaska.

This is an aerial photograph taken on a day in June three years ago.

This is an aerial photograph taken this year.

That is the retreat of this glacier.

The glacier's main trunk, or mainstream, comes from the right side and climbs its trunk very rapidly.

We'll be there in a few more weeks, and probably expect to be back half a mile, but I wouldn't be in the least bit surprised if I got there and found it had collapsed eight miles further away.

Right now, it's very difficult to get a sense of the scale of these locations. Because, like glaciers, places like Alaska and Greenland are huge, no ordinary landscapes. But as the glacier retreats, it deflates, like the air out of a balloon.

And this landscape has its own characteristics.

There's a ridge in the middle of the picture above where the arrow comes in that you can see a little bit.

Above the small red illustration is a marker line called the trim line.

This is something no self-respecting photographer would ever do. You put cheesy illustrations in your shots, right? -- Still, sometimes I have to make these points.

But anyway, since 1984, this glacier has contracted higher than the Eiffel Tower and taller than the Empire State Building.

Vast amounts of ice flow out of these valleys, causing the ice to recede, collapse, and move up the valleys.

These changes in the alpine world are accelerating.

it is not static.

Especially in the world of sea ice, the rate of natural change is faster than predicted just a few years ago, and either the process is accelerating or the predictions were too low in the first place.

But either way, big, big changes are happening as we speak.

So, here is a time-lapse shot of Columbia.

And you'll see where it ended on various spring days in June, May, and October.

Then turn on Timelapse.

This camera was shooting every hour.

A geological process is underway here.

And everyone says, won't it go on in the winter?

No, it was retreating during the winter due to an unhealthy glacier.

I finally caught up with myself and moved forward.

And you can look at these pictures over and over again. Because there's a very strange, strange charm to seeing these things come to life that you don't normally see.

We've been talking about seeing the invisible at TED Global, "seeing is believing".

That's what you see on these cameras.

Images make the invisible visible.

This huge crevasse is open.

These giant ice islands are breaking apart. And look at this.

This spring was a massive collapse. It happened in about a month and all the ice was lost.

So that's where we started three years ago, it's all the way to the left, and it was there when we last entered Colombia a few months ago.

To give you a sense of the scale of the retreat, I created a cheesy illustration of a British double-decker bus.

If you line up those 295 from nose to tail, that's how far back it goes.

It's a long road.

Continue to Iceland.

One of my favorite glaciers, Solheimajokull glacier.

And here, if you look closely, you can see that the end point is receding.

You can see this river forming.

I can see that you are withering.

Without the photographic process, you would never see this. This is invisible.

If you stand there for the rest of your life, you'll never see it, but the camera will record it.

So let's rewind time backwards.

A few years back.

That's where it all started.

That's where it ended a few months ago.

and to Greenland.

The smaller the ice mass, the faster it reacts to the weather.

It took some time for Greenland to start reacting to the warming climate of the last century, but it really started moving at breakneck speed about 20 years ago.

And the temperature in the sky has risen abnormally.

It's a big place. It's all ice.

They are all ice in color, up to about two miles thick, with only a huge dome rising from the coast and towering in the middle.

The Ilulissat Glacier is the only glacier in Greenland that sheds more ice into the Earth's oceans than all other glaciers in the northern hemisphere combined.

We set up a few cameras at the southern tip of Ilulissat to watch baby faces as they pass through this dramatic retreat.

I tried to record it for two years.

A helicopter was placed in front of the calving face to check the scale and immediately downsized.

The maternity table face is 4.5 miles in diameter, but in this shot we're backing out so we can only see about 1.6 miles.

So imagine how big this is and how much ice it will eject.

Greenland's hinterland is on the right.

It drains into the Atlantic Ocean on the left.

Icebergs, many times the size of this building, roar into the sea.

As you can see, I just downloaded these photos a few weeks ago. On June 25th, a monster birth event occurred.

I'll show you one of them soon.

The glacier has doubled in velocity in the last 15 years.

Now it's going at 125 feet a day dumping all this ice into the ocean.

It tends to go in such a pulse about every three days, averaging 125 feet per day, double the speed it was 20 years ago.

have understood. We teamed up to observe this glacier and document the largest birth event ever documented.

Nine cameras were working.

This is what some cameras saw.

A 400 foot high calf face break.

A huge iceberg rolls.

Now how big was it? Hard to get.

If you look at the illustration again, you can feel the sense of scale.

In this particular event, we retreated 1 mile in 75 minutes across a 3 mile wide calving surface.

The block is three-fifths of a mile deep and, when compared to the extent of the calving surface of Tower Bridge in London, is about 20 bridges wide.

Or, taking the US Capitol as an example, if you cram 3,000 capitols into that block, it's the size of that block.

75 points.

After spending so much time in this climate change world, I have come to the conclusion that economics, technology and public policy issues do not exist.

We have a perception problem.

Policy, economics and technology are serious enough problems, but in reality we can deal with them.

I'm sure you can.

But what we have is a perception problem. Because there are still not enough people who actually understand it.

You are an elite viewer. Understood.

Fortunately, many of the political leaders of the world's major nations are elites, and most of them now understand that.

But we still have a lot to bring.

And that's where I think organizations like TED and the Extreme Ice Survey can have a huge impact on human perception and guide us.

Because we believe that now is our chance.

We are almost on the brink of a crisis, but we still have an opportunity to face the greatest challenge of our generation, and indeed this century.

This is a frightening, frightening call to do the right thing for ourselves and our future.

I hope that our better natured angels have the wisdom to rise to the occasion and do what they have to do. thank you.

(applause)

I think I was about 12 years old when my father took me to a space exhibition in Brussels not far from here.

And I think that year was 1988. It was the year the Cold War ended.

There was a slight sense of superiority between the Americans and Russians who brought trinkets to the exhibition.

NASA brought the big detonation space shuttle, while Russia brought the Mir space station.

It was actually a training module and you could go inside and see it all.

It was real – where the buttons were, where the wires were, where the astronauts were eating, where they were working.

And when I got home, I started drawing a spaceship first.

Now, these weren't sci-fi spaceships.

They were actually technical drawings.

They were cross-sections showing what kind of construction they were made of, where the wires were and where the screws were.

Fortunately, I didn't become a space engineer, but I became an architect.

These are some of the projects I've been involved in over the past decade and a half.

These projects are all very different and have very different shapes because they are built for different environments.

They have different restrictions.

And I think design gets really interesting when given really tight constraints.

These projects are now taking place all over the world.

A few years ago, this map wasn't good enough.

It was too small.

We had to add this because we were going to do a project on the moon for the European Space Agency. They asked us to design a lunar settlement. He commissioned the design of a Martian settlement with NASA, a competition to consider a Martian settlement.

As an architect, whenever I go to another place and try to design something, I look at the architecture of that place, the precedents there.

Well, on the moon, this is the only one, so of course it's a bit difficult.

All that's left is the Apollo program.

The last time I was there, I hadn't been born yet and had only been there for about three days.

So for me it's like a long camping trip, but a pretty expensive one.

Now, when trying to build a building on another planet or moon, the challenge is how to get it there.

First of all, it is very expensive, at about $200,000 to transport a kilogram to the surface of the Moon, for example.

Therefore, we want to keep it very light.

Second, spaces. Space is limited. right?

This is the Ariane 5 rocket.

The space there is about 4.5 meters by 7 meters, not very big.

So it has to be a compact, or compactable and lightweight architectural system, and I think I have it here.

Very compact and very light.

Actually, this is one I made before.

Well, there's one problem with this. That said, inflatables are very fragile.

Especially when going to a very harsh environment like the moon, you need to protect it.

Look at it like this.

Temperature differences on the moon base can be up to 200 degrees.

It can be 100 degrees Celsius on one side of the base and minus 100 degrees on the other.

we have to protect ourselves from it.

Also, the moon has no magnetic field. In other words, all radiation, such as solar radiation and cosmic radiation, hits the surface of the earth.

We need to protect ourselves from it and protect our astronauts from it.

And third, but definitely not last, the Moon has no atmosphere. That is, a meteor that hits the moon does not burn up, but hits the surface.

That's why the moon is full of craters.

Again, we have to protect our astronauts from it.

What kind of structure do you need?

Well, actually the best thing is the cave. Because the cave has a lot of mass and needs mass.

We need mass to protect us from temperature, radiation and meteorites.

So this is how we solved it.

As you can see, there is actually a blue part.

It's an inflatable for a lunar base.

It provides a large living space and a large experimental space, has cylinders attached to it, and incorporates all support structures, all life support equipment, and an airlock.

On top of that, we have structures to protect ourselves. Its dome-shaped structure contains a large mass.

Where do you get this material?

Are we going to transport concrete and cement from Earth to the Moon?

Well, too heavy, so of course not.

This is too expensive.

So I would like to use local materials.

Well, even on earth we work with local materials.

Wherever we build, in which country we build, we always look, what are the local materials here?

The problem with the Moon is what the matter in that region is.

Well, not much.

Actually, we have one too.

It is moondust, or in its more fancy scientific name regolith, moon regolith.

What's great is that it's everywhere, right?

The surface is covered with it.

It is anywhere from about 20 centimeters to several meters.

But how do you build with it?

Well, let's use a 3D printer.

Every time I ask you what a 3D printer is, you're probably thinking that it probably prints something this size.

So, of course, we're not going to bring a giant 3D printer to the moon to print a lunar base.

Here we use a device similar to this, much smaller.

This is a small device with a small scoop, a small robotic probe, that carries the regolith into the dome and deposits a thin layer of regolith. A robot then solidifies the regolith, layer by layer, creating a complete foundation after a few months.

You may have noticed that we are printing a very specific structure here. Here's a small example.

This is called closed cell foam structure.

looks very natural.

The reason we use this as part of the shell structure is that we only need to harden certain parts. That means it takes less binder from Earth and is much lighter.

Well, the approach of designing something and then covering it with a protective dome was also used in the Mars project.

You can see three domes here.

And you can see the printer printing these dome structures.

There is a big difference between Mars and the Moon, so let's explain it.

This diagram shows to scale the size and actual distance between the Earth and the Moon (about 400,000 kilometers).

If you go to Mars next, it will be the distance from Mars to Earth. And this photo was taken by the Mars rover Curiosity looking back at Earth.

You can see a little speck over there, and it's the Earth, 400 million kilometers away.

The problem with this distance is that it is 1,000 times the distance from the Earth to the Moon, which is quite far, but there is no direct radio communication with, say, the Curiosity rover.

Therefore, it cannot be remotely controlled from Earth.

You can't say, "Oh, Mars rover, go left." Because it takes 20 minutes for that signal to reach Mars.

After that, the rover could go left, but then it would take another 20 minutes before it said, "Oh, we went left."

Due to the large distances, probes and robots must operate autonomously.

The only problem is that missions to Mars are extremely dangerous.

We just saw it a few weeks ago.

So what if half the mission didn't reach Mars?

what do we do

Well, instead of building just one or two rovers like we did on the moon, we're going to build hundreds.

It looks a bit like a termite mound.

Termites, I would remove half the termite colony and they would still be able to build mounds.

It may take a little longer.

same here.

If half the rovers or robots don't arrive, it will take a little longer, but it's still possible.

So we also have three different rovers here.

You can see the excavator in the background.

I'm good at digging regolith.

Then there are transporters that are good at taking regolith and transporting it to structures.

And the last one, a little one with tiny feet, doesn't need to move much.

What they do is they sit on layers of regolith and heat them together in a microwave, creating that dome structure layer by layer.

Well, we wanted to try it too, so we went on a road trip and created our own robot swarm.

Here you go.

So I built 10 of them. It's a small flock.

And then we took 6 tons of sand to see how these little robots could actually move sand, in this case the sand of the earth.

And they weren't remotely controlled. right?

No one told them to go left or right, or gave them pre-determined paths.

No, they were tasked with moving sand from this area to that area.

And when we encountered obstacles such as rocks, we had to solve them ourselves.

Alternatively, if you encountered another robot, you had to make a decision.

Or if one half falls off and the battery dies, it should still be able to complete that task.

Well, we talked about redundancy.

But it's not just robots.

It was also a habitat.

For the Mars project, we decided to have three domes. Even if one does not arrive, the other two can still form a base. The main reason is that each dome floor actually has a built-in life support system and can function independently.

In a way you might think this is pretty crazy.

Why are you an architect involved in space?

Because it's a very technical field.

Well, from a creative point of view and a design point of view, I actually believe that we can solve very difficult and very constrained problems.

And I really feel that projects like Interplanetary Habitation have room for design and architecture.

thank you.

(applause)

You have been accused of a crime you didn't commit.

It is impossible to prove your innocence.

If you insist on innocence anyway, you will probably be found guilty and executed.

But confess, apologize, implicate others, and you will be free.

Will you make a false confession or risk public hanging?

This was the choice faced by those accused of witchcraft in the village of Salem, Massachusetts from February 1692 to May 1693.

They were victims of a supernatural and misdirected religious zeal and a judicial system that valued repentance over truth.

Salem was settled in 1626 by a group of English Protestants, the Puritans.

Life in Salem was tough and isolated.

Fighting groups of neighboring Native Americans and French settlers was commonplace.

People feared starvation and disease, and relations between villagers became strained.

To make matters worse, 1692 saw the coldest winter on record.

That winter, two cousins, 9-year-old Betty Paris and 11-year-old Abigail Williams, began acting very strangely.

Doctors found nothing physically wrong, but diagnosed the girls as having been exposed to an "evil hand." The Puritans believed that the devil had destroyed nature, conjured demonic visions, and wreaked havoc on the world through human agents, witches, who tormented children.

The symptoms seemed to spread as the news spread through the village.

The report lists 12 so-called "suffering" girls who contort, have seizures and complain of skin tingling.

Four of the girls immediately accused them of torturing three local women.

All three defendants were considered outsiders in some sense.

On February 29, authorities arrested Sarah Goode, the impoverished pregnant mother of her little daughter Sarah Osborne, who had been absent from church for a long time and was suing the family of one of the accusers, and Tituba, known only by her first name after being enslaved in the home of Betty Parris.

Tituba initially denied having harmed the girls.

Later, however, she confessed to practicing witchcraft on the orders of the devil and accused Goode and Osborn of forcing her to do so.

Both Osborne and Goode have pleaded not guilty.

Osborne died in prison, but Goode's husband rebelled against her in court, testifying that she "was, or will soon become, a witch."

Goode's four-year-old daughter was imprisoned and eventually testified against her mother.

Goode, on the other hand, gave birth in prison.

Her baby died, and soon after she was convicted and hanged.

Tituba was detained until May, after which he was released.

These three victims were just the beginning.

As the accusations mounted, some, like Tituba, made false confessions to protect themselves.

Authorities reportedly even told one of the accused witches that he would be hanged if he didn't confess, or released if he did.

They weren't particularly interested in thoroughly investigating the charges. It wanted the defendant to confess, ask for forgiveness, and promise not to engage in witchcraft any more, according to the teachings of the church.

Courts accepted all sorts of questionable evidence, including so-called "ghost evidence" that the girls went on a rampage after supposedly being touched by an invisible ghost.

To further complicate matters, many of the jurors in the trials are relatives of the accusers, undermining their objectivity.

Those who dared speak out, such as Judge Nathanial Saltonstall, were the target of suspicion.

By the spring of 1693 over 100 had been imprisoned and 14 women and 6 men had been executed.

By this time, accusations had begun to spread beyond Salem and into neighboring communities, targeting even the most powerful individuals.

When his own wife was indicted, the Governor of Massachusetts stopped the trial.

The sentence was amended, the prisoner released, and the arrest stopped.

Some speculate that the girls may have suffered hallucinations caused by a fungus. or a condition that caused swelling of the brain.

Ultimately, however, the reasons for their actions are unknown.

What we do know is that adults accepted children's outlandish accusations as solid evidence.

Today, the Salem Witch Trials remain a cautionary tale about the dangers of groupthink and scapegoating, and the power of fear to manipulate human perception.

Shah Rukh Khan: The speaker you are about to meet knows and understands the value of words better than anyone else.

In a writing career that spans over 40 years, this man has chosen words of beauty and variety, like flowers that come to life.

Like Professor Bachchan's memorable punch...

(Laughter) It's like a best-selling Urdu poetry book...

Well, yes... how to say, only Javed Akhtar Sahab.

(Applause) Welcome to the stage, the one and only Javed Akhtar Sahab.

(Cheers and applause) Javed Akhtar: Ladies and gentlemen, this subject, the power of words, is interesting and very close to my heart.

Strangely enough, we often miss things that are very close, very close.

How many of us wonder, "Why is the air transparent?"

Or "Why is water wet?"

How many of us are thinking about the past?

Time has passed. what came What's gone?

How many people wonder?

Likewise...

How many times have we thought about the words we speak and hear all day long, "What is this word?"

Words are strange things.

You have seen an animal and decided it was a "cat".

But cats are sounds.

This cat has nothing to do with that animal.

But I decided it was a cat.

That's why I'm a cat.

After that, I made a semicircle and a pyramid, cut it in half, then drew a straight line, and then drew another one under it and wrote "cat".

Within these intersecting lines, I packed sounds and meanings within those sounds.

Like this cat now, love, anger, thoughts, ideas, pain, suffering, joy, surprise, everything is connected by sound.

The sounds were then embedded in a number of intersecting lines called scripts.

So I combined three disparate elements to create a word.

It actually adds a nonsensical sound.

And the lines, the curved lines, they formed the word.

can't believe it!

And over time, I've come to believe that these words have become more human.

A man is known by the companions he is dating.

Similarly, what is the company that has continued to protect the words?

What other words are used together?

For average nouns and verbs, the average mind can quickly create a reference.

where did they hear that? can you see it?

What does it remind them of?

What is that relationship? When was it last used in conversation?

what was my experience about it?

When I hear the words I remember, various memories come to mind.

And a good writer or orator is one who knows that when he uses a word, the average mind associates it with a reference and evokes a particular memory.

Then he can create a world around the word.

What is the power of words?

Whether it's a mother's lullaby, a politician's speech, a love letter from a loved one, a complaint against someone, a phone call of protest...

Forget that anger, sadness, happiness, surprise, belonging, alienation, everything in the world, every emotion in the world, every feeling, every reaction, unless it is expressed in words, it means nothing to you and it will be passed on to others.

Words are not thoughts any more than bricks are houses.

But the house is made of bricks.

You can build a small house with less bricks.

The more words you have, the clearer your thoughts will be and the more clearly you will be able to communicate them.

Recently, especially young people often ask me, "Do you understand what I'm saying?"

No, I don't know what you're talking about.

(Laughs) I run out of words when I say, "You know what I mean."

Everything moves fast these days, so communication has to be fast too.

But the tragic thing is that we achieved this speed at the expense of language depth.

We want to speak faster, so everything is faster, languages ​​are faster, we communicate faster.

In other words, forget about others and look only at yourself.

You are unable to express your feelings, thoughts, or feelings in detail or clearly.

And these words, as long as they exist, do not exist only for their meaning.

They are also the language, the verbal transmission belt.

They reflect your culture, your traditions, your heritage, your cultural wealth accumulated over generations, all of which is conveyed through words.

To cut a person off from language is to cut him off from culture and history.

This is exactly what is happening to us today.

So language is a very powerful thing.

Words have tremendous power.

But it is neither good nor bad per se.

If we begin to love words and understand their power, we will realize that everything that happens in the world is because of them.

Or perhaps there would be nothing between us and other creatures, the rest of the animals, although we are also animals.

The only difference is that we are able to pass on our experiences, learnings and knowledge to the next generation through language.

Therefore, we do not live by instinct alone, but experience and knowledge slowly accumulated over generations and passed on to the next generation.

through what? through words.

If we didn't have this language, our superiority over other species would fade over time.

We have progressed only because we have language.

And if it weren't for that, we wouldn't be here.

We will be right at the starting point.

So what do we mean by language?

words!

So learn to respect your words.

love them

Make friends with them.

Listen carefully.

And speak carefully.

thank you!

(Applause.) SRK: Javed Sahab, thank you so much for being here today and sharing such a wonderful thing with us.

I have known Javed Sahab since I came to Mumbai about 25 years ago.

JA: I was really young then.

(laughs) SRK: Yes. Teacher, you are still very young.

But I got a lot of education, ideology and many other things from Javed Sahab.

Share small things.

He got mad at us during the making of the movie.

He sometimes gets angry when ignorant people like us suggest that he might use the word instead.

So our movie was named "Kuch Kuch Hota Hai".

(cheers) And he didn't like the title at all.

So once, when he got really mad at us children who are still his children, he retorted: "Now my mind neither wakes nor rests.

what do i do? oh! I feel something strange.

is that what you want? ”

In fact, the entire song, every word, was thrown at us by Javed Sahab in a fit of rage.

And the song became very popular.

So even if Javed Sahab throws out words in anger, they turn into golden words.

That's his gift.

(Cheers) JA: Well, the events shared by Shah Rukh Sahab are indeed true.

So when I heard the title "Kutch Kutch Hota High", I was shocked.

I felt that I lacked dignity.

(Laughs) To be honest, it's a shame that such a big hit movie has been neglected because of the title.

So I stepped away from the movies.

I felt a little embarrassed afterwards and he felt bad too.

So we decided to leave the past behind and work on another movie.

Hence the film "Kal Ho Naa Ho".

I told him everything else was fine, but I owe you two things.

two kush.

(Laughs) Then I will write a song and return these two to you.

I wrote the song "Ku Chi to Hua Hai, Ku Chi Ho Gaya Hai" specifically for this reason.

(Cheers and applause) And he gave two back.

(Applause.) Ladies and gentlemen, a big round of applause for Javed Akhtar Sahab.

(applause)

Today I would like to talk about swimming across the North Pole, the northernmost point in the whole world.

And perhaps the best place to start is about my late father.

he was a great storyteller.

He was able to tell a story about an event so you felt absolutely there in the moment.

And one of the stories he used to tell me when I was little was about Britain's first atomic bomb test.

He was there watching it disappear.

And the explosion was so loud and the light so intense that he had to put his hand in front of his face to actually protect his eyes, he said.

And the light was so bright, he said, that he could actually see an X-ray of his finger.

And I know that seeing that atomic bomb explode had a huge impact on my late father.

When I was little, I always went to national parks on holidays.

What he was trying to do for me was to inspire me to protect the world and show how fragile it is.

He also told me about a great explorer.

He loved history. He used to tell me about Captain Scott walking to the South Pole and Sir Edmund Hillary climbing Mount Everest.

So, since I was probably six years old, I dreamed of going to the Polar Regions.

I really wanted to go to the North Pole.

There was something about the place that attracted me.

And dreams can take a long time to come true.

But seven years ago I went to the North Pole for the first time.

It was so beautiful that I have been coming back there for seven years since then.

i love the place.

However, I have seen the place change in a short period of time, indescribable.

I have seen polar bears walking on very thin ice in search of food.

I once swam in front of a glacier that had retreated greatly.

And the amount of sea ice that I see is decreasing year by year.

And I wanted the world to know what was going on there.

In the two years before I swam, 23 percent of Arctic sea ice had melted.

And I wanted to shake the lapels of world leaders and make them understand what was happening.

So I decided to do this iconic swim at the top of the world, a place that should be frozen but the ice is rapidly melting.

And the message was very clear. Climate change is real and we need to do something about it.

And we need to do something about it now.

Well, swimming across the North Pole is not normal.

So 27 degrees is a normal indoor pool temperature.

The temperature in the English Channel this morning was 18 degrees.

A passenger who fell from the Titanic fell into water that was only 5 degrees Celsius.

Fresh water freezes when it reaches zero.

And the water temperature in the Arctic is minus 1.7.

It's fucking cold.

(Laughter.) (Applause.) Sorry, but there's no other way to explain it.

(Laughter) So I had to gather around me a great team to help me with this task.

I put together this team of 29 people from 10 countries.

Some people think that swimming is a very solitary sport and that you just jump into the ocean and go.

For me it was not far from the truth.

Then I did a huge amount of training, swimming back and forth in ice water.

But most importantly, I trained my mind to prepare for what was to come.

And I had to visualize the swim.

I had to watch the whole thing from start to finish.

I had to taste the salt water in my mouth.

I had to watch my coach yell for me. "Go for it, Louis! Go for it! Go! Go! Go! Don't slow down!"

So I literally swam across the North Pole hundreds of times in my mind.

And after a year of training, I felt ready.

I was confident that I could really do this swim.

So me and five other team members boarded an icebreaker to the North Pole.

On the fourth day, I decided to do a quick 5 minute test swim.

I had never swam in water that was -1.7 degrees. Because it is impossible to train in such an environment.

So we stopped the ship, just like you.

We all got off on the ice and I put on my bathing suit and jumped into the sea.

I have never felt anything like that moment in my life.

I could hardly breathe. I was gasping for air.

I hyperventilated so badly that my hands went numb within seconds.

And it was. The paradox is that you are in freezing cold water, but you are actually on fire.

I swam as hard as I could for five minutes.

I remember just trying to get out of the water.

I crawled out of the ice.

And I remember taking the goggles off my face and looking down at my hands in sheer shock because my fingers were swollen like sausages.

And it was too swollen to close.

What happened is that parts of our bodies are made of water, and when water freezes, it expands.

So what actually happened was that the cells in my finger froze and swelled.

and they burst. And I suffered a lot.

I quickly boarded the boat and took a hot shower.

And I remember standing under the hot shower, trying to frost my fingers.

Two days later, I decided to swim across the North Pole.

I was thinking of swimming for 20 minutes to cross the North Pole for 1 kilometer.

And this dream, which I had seen with my father since childhood, was about to disappear out the window.

Nothing like this is possible.

And I remember getting out of the shower and realizing I couldn't even feel my hands.

And if you're a swimmer, you need good hand feel as you have to grab and pull the water out.

The next morning I awoke in a very depressed state, and all I could think of was Sir Ranulph Fiennes.

For those who don't know him, he was a great British explorer.

Many years ago he tried to ski to the North Pole.

He accidentally cut through the ice and fell into the sea.

And after just three minutes in the water, he was able to escape on his own.

And his hands got so badly frostbitten that he had to go back to England.

He went to a local hospital where he was told, 'Lan, there is no chance we can save this finger.

You actually have to take them off. ”

And Ran decided to go to the tool shed and get out a saw and do it himself.

And I thought, if the same thing happened to the orchids after 3 minutes, and my hands went numb after 5 minutes, what would happen if I tried for 20 minutes?

At worst, you'll lose a few fingers.

And worst of all, I didn't even want to think about it.

We continued our voyage through the ice mass towards the North Pole.

And my best friend David saw the way I was thinking and he came up to me and said, 'Louis, I've known you since you were 18.

I know you, and I know, Luis, deep down, deep down here that you're going to let this swim.

I believe in Lewis with all my heart. I have seen your training.

And I understand why you are trying to do this.

Swimming is very important.

We are standing at a very pivotal moment in this history and you are here to take an iconic swim and shake the lapels of world leaders.

Luis, have the courage to come in, for we will take care of every moment. ”

And I was very confident that he would say that because he knew me so well.

So we continued our voyage and reached the North Pole.

And we stopped the ship, and it was exactly what the scientists predicted.

The sea was open everywhere.

Then I went down to the cabin and put on my bathing suit.

Then the doctor put me on a chest monitor that took my core temperature and heart rate.

And we were out on ice.

I remember looking into the ice and seeing that there was a big white block of ice and the water was black.

I've never seen black water before.

And its depth is 4,200 meters.

And I said to myself, "Louis, don't look left or right.

Just move forward and move towards it. ”

So I'd like to show you a short video of what happened on ice.

Narrator (video): We're just out of port, and it can be a little emotionally unstable at this stage.

Everything looks gray around here and it looks very cold.

We just saw a polar bear for the first time.

It was like magic.

Mother and child, what a beautiful sight.

And they may be extinct in 30 or 40 years.

It's a very scary, very, very scary thought.

We have finally arrived at the North Pole. It takes months and months of dreaming and years of training and planning and preparation to get here.

ah. I'm going to swim in here in a few hours.

It's all a little scary and emotional.

Amanson, are you ready? Amadson: Ready.

Louis Pugh: You have ten seconds to swim. 10 seconds to swim.

Please remove the goggles. Take off your goggles!

Man: Take your shoes. put on your shoes

Well done! You made it! Well done, Lewis!

You made it! You did it!

LP: How on earth did you do that?

Man: Go against the flow! You went against the tide and did it!

(Applause) LP: Thank you. thank you very much.

(Applause.) Thank you very much.

Audience: Again!

(laughs) LP: I would like to conclude by saying this. It took another 4 months before I could feel my hands.

But was it worth it? Yes it certainly was.

Few people are unaware of what is happening in the Arctic right now.

And people ask me, "Louis, what can we do about climate change?"

And I said to them, I think we need to do three things.

The first thing we need to do is break this problem down into manageable pieces.

You saw all these flags in that video, right?

Those flags represented the country my team was from.

And similarly, when it comes to climate change, every country will have to make cuts.

UK, USA, Japan, South Africa, Congo.

We are all in the same boat together.

The second thing we have to do is look back at how far we've come in this short period of time.

Just a few years ago, I remember talking about climate change and people jeering behind my back that there was no such thing.

I have just returned from giving a series of speeches to children as young as 10 in some of South Africa's poorest towns.

There are four or five children sitting behind desks, and they all have a very good understanding of climate change, even in the most dire of circumstances.

we have to believe in ourselves.

Now is the time to believe.

we have come a long way. we're doing well

But I think the most important thing we all have to do is walk to the end of our lives and turn around and ask ourselves the most fundamental questions.

It is: "What kind of world do we want to live in, and what decisions will we make today to ensure that we all live in a sustainable world?"

Thank you so much to all of you.

(applause)

Your hands are never smooth when you look at them up close.

With peaks and valleys, folds and crevices, there are many hiding places for viruses to attach themselves to.

After that, touching your face can transmit the virus.

But there are two very easy ways to prevent it. Soap, water, and hand sanitizer.

So which one is better?

The coronavirus that causes the novel coronavirus disease (COVID-19) is one of many viruses whose protective outer surface is made of a lipid bilayer.

These lipids are pin-like molecules whose heads are attracted to water and whose tails are repelled by water.

Therefore, in a water-rich environment, lipids naturally form such a shell, with the head on the outside and the tail on the inside.

Their common reaction to water causes lipids to stick loosely. This is called the hydrophobic effect.

This outer structure helps the virus' molecular machinery to penetrate the cell membrane and take over our cells.

But there are thousands of weak spots that the right molecules can pry open.

And here comes soap.

A drop of any brand of soap contains hundreds of billions of molecules called amphiphiles that resemble biological lipids.

The tail, which is also repelled from water, competes for space with the lipids that make up the viral shell.

But they are different enough to disrupt the regularity of the viral membrane and the whole thing collapses.

These amphiphiles form their own bubbles around particles containing viral RNA and proteins.

Applying water will wash away the entire foam.

Hand sanitizer works more like an earthquake than a crowbar.

Surrounding the coronavirus with water strengthens the binding within the membrane due to hydrophobic effects.

The same effect holds the large proteins that form the spikes of coronaviruses in place and shape that allow them to infect cells.

Allowing the virus to air dry preserves its stability.

But now, it's surrounded by high concentrations of alcohol, like the ethanol and isopropanol found in most hand sanitizers.

This eliminates any hydrophobic effects and gives the molecules room to move around.

The overall effect is like removing all nails and mortar from a house and then giving it an earthquake.

The cell membrane collapses and the spike protein crumbles.

Either way, the actual process of destroying the virus occurs in just 1-2 seconds.

However, due to the complex shape of the hands, doctors recommend washing hands for at least 20 seconds.

To properly protect you, soap and sanitizer should be distributed everywhere, including your palms, fingertips, the outside of your hands, and between your fingers.

And when it comes to the coronavirus outbreak, doctors recommend washing your hands with soap and water whenever possible.

Both approaches are equally effective at killing viruses, but soap and water have two advantages. One is to wash away dirt that can hide virus particles.

But more importantly, it's easier to completely cover your hands with soap and water for 20 seconds.

Of course, hand sanitizer is more convenient for on-the-go use.

If you don't have a sink, use the disinfectant as thoroughly as possible and rub your hands together until they are dry.

Unfortunately, billions of people do not have access to clean drinking water. This is a big problem all the time, but especially during an outbreak.

Researchers and aid organizations are working to provide solutions to these communities.

One example is a device that uses salt, water and car batteries to kill harmful germs and produce chlorinated water that is safe for hand washing.

So soap and water is recommended against coronavirus whenever possible, but does that mean it's best for any virus outbreak?

necessarily.

Many colds are caused by rhinoviruses, which have a geometric protein structure called a capsid instead of a lipid membrane.

The capsid has few weak spots through which the soap's amphiphiles can pry it open, so it takes longer for the soap to take effect.

However, some of its surface proteins are still vulnerable to the destabilizing effects of hand sanitizers.

In these and similar cases, hand sanitizers may be more effective, especially if hands have been washed to remove residual particles.

The best way to know which one to use for a particular epidemic is to do what is best for all things disease related. In other words, follow the advice of a certified medical professional.

Joan Blaze: Do you have politically diverse friends?

what do you talk about with them

i am a progressive. I live in a progressive town, but 15 years ago I didn't have a single conservative friend.

I have great friends now, including John.

John Gable: I'm not a progressive.

I am a Republican, raised in a conservative Southern Republican household, and have been involved in Republican politics locally and nationally.

But for the last 24 years I have been in the technology field and I live in a very progressive field.

So I have a lot of progressive friends, including Joanne.

JB: I was born in Berkeley, California, which is famous for being a progressive university city.

And I live there now.

In 1998, six months after the Monica Lewinsky and Clinton impeachment scandals, I helped co-found MoveOn.org with a one-sentence petition that "Congress must immediately condemn the president and move on to the most pressing issues facing the nation."

Now, this was actually a very cohesive petition in many ways.

Some will love Clinton, some will hate him, and some will agree that the best thing for the country is to move on.

As the leader of MoveOn, I've seen the increasing polarization.

And it made me wonder why I see things so differently than many people in other parts of the country.

So in 2005, when the opportunity arose to meet with grassroots leaders across political divides, I seized it.

And I made friends with many people I never had the chance to talk to.

And that includes the leadership of the Christian Coalition, which is often seen as right-wing in the same way that MoveOn is seen as left-wing.

And this led me to show up at the Capitol with a friend of mine, one of the leaders of the Christian Union, to lobby for net neutrality.

That was powerful.

we turned around.

So this job was transformative for me.

And then I found myself wondering. How can vast numbers of people have the opportunity to actually connect with people who have very different views?

JG: I was born in Oneida, Tennessee, just across the border from a small coal mining town called Stearns, Kentucky.

And there I lived the first few years of my life before moving to another small town, Frankfort, Kentucky.

Basically, I grew up in a conservative American small town.

Now Stearns and Berkeley -- they're a little different.

(Laughter) So in the 90's I moved to a progressive region in the west to work in the technology field. Worked at Microsoft and Netscape.

In fact, I became the lead product manager for Netscape Navigator, the first popular web browser.

In the early days of the Internet, we were moved and inspired by a vision. When we connect with different people and different ideas from all over the world, we will be able to make better decisions and appreciate each other the beautiful diversity that the whole world has to offer.

Well, I gave a speech 20 years ago that it may not work that way, in fact we may be trained to discriminate against each other in new ways.

what happened?

It's not like we woke up one day and decided to hate each other more.

I will explain what happened.

There's too much noise, too many people, too many ideas, and we use technology to filter it out a bit.

And what will happen?

I can take ideas that I already agree with.

It accepts popular ideas and accepts people who think like me.

That's kind of nice.

Well, not necessarily. Because when we have a very narrow worldview, two very scary things happen.

First, we become more extreme in our beliefs.

Second, we become intolerant of those who are different from us.

Does this sound familiar?

Is this like modern America? modern world?

The good news is that technology is changing and it can change for the better.

In fact, that's why I started AllSides.com. To create technologies and services that free us from the filter bubble.

The first thing we did was create a technology that identifies bias. This allowed us to view different perspectives side-by-side to free us from the news media filter bubble.

Then I met Joan.

JB: So I met John in the suburbs of Washington, D.C., with an idealistic group of bipartisan bridge builders, and we wanted to reshape the fabric of our community.

We believe that our differences can be strengths, that our values ​​can complement each other, and that we must overcome this battle to respect everyone's values ​​and not lose ours.

I went with John on this great walk where I started learning about the work he was doing to pierce the filter bubble.

It was powerful. It was great.

Living in separate stories is not good.

If you don't share the same facts, you can't even have a conversation or even work together to solve a problem.

JG: So one of the takeaways from today is that if Joan Blaze invites me to go for a walk, I go for the walk.

(Laughter) It changed the situation. It really changed the way I think about things.

To break free from filter bubbles, we need to think not only about information filter bubbles, but also about relationship and social filter bubbles.

As you know, we humans are not as smart as we think we are.

We usually don't make decisions intelligently.

We create them emotionally, intuitively, and then use our old big brain to rationalize whatever we want to rationalize.

We are not Vulcans like Mr. Spock, but rather daring cowboys like Captain Kirk or passionate idealists like Dr. McCoy.

OK, if you like the new "Star Trek" crew, here you go.

(laughs) JB: Don't forget the strong women!

JG: Come on, strong women. OK.

JB: Okay.

John and I are both Star Trek fans.

What makes you dislike such an optimistic future?

JG: And having a good future in mind is a big thing, very important.

And it's very important to understand what the problem is.

But we have to do something.

What should I do?

It's actually not that difficult.

We must add variety to our lives. Not only information, but also the diversity of relationships must be added.

By diversity, I mean a big 'D' diversity, not just race and gender which is very important.

Age diversity, including young and old. countryside and city. liberal and conservative. Democrats and Republicans in America.

Now, one of the great examples of someone breaking out of a filter bubble and having a more diverse life is, again, Joanne next to me.

JB: So the question is, who among you has ever had a relationship lost or hurt because of political, religious, or other differences?

Please raise your hand.

yes.

This year I have spoken to many people who have experienced such losses.

I have seen tears welling up in people's eyes as they talked about estranged family members.

The living room conversation was designed to begin mending political and personal differences.

It's a simple conversation where two friends with different perspectives each invite two friends into a structured conversation. There, curiosity, listening, respect, alternation, everything we learned in kindergarten, we all agree on a simple ground rule.

Really easy.

So by the time you talk about the topic you agreed to talk about, you'll actually have a sense of "I like this person" and it will change the way you listen to each other.

It is a kind of human condition. We listen to our loved ones.

Then there is reflection, and in some cases, the next step.

This is a deep listening exercise. It's never an argument.

And it's incredibly powerful.

Conversing with people with different points of view in your own living room is an incredible adventure.

We rediscover that we can respect and even love people who are different from us.

And it's powerful.

JG: So what are you interested in?

JB: What conversation are you looking for?

JG: Let's do it together.

together.

JB: Yes.

(Laughter) (Applause) JB and JG: Thank you.

In the spirit of co-creation, what I'm going to do is just repeat a lot of what the three people before me have already said, but do it. We call this “creative collaboration”. It's actually called "borrowing," but it does it through a particular perspective. It asks about the roles of users and consumers in this emerging world of co-creation that Jimmy and others have talked about.

A simple question to begin with, who invented the mountain bike?

Because, according to traditional economic theory, mountain bikes were probably invented and spawned by big bike companies that had big R&D labs thinking about new projects. It didn't come from there.

Another answer might come from something like a lone genius working in a garage. He researches different types of bikes and comes up with one out of nothing.

It didn't come from there. This mountain bike is made by users, young users, especially from a group in Northern California who were dissatisfied with traditional racing bikes like those ridden by Eddie Merckx and your big brother, and it's very appealing.

But the bike your father was riding had such a big handlebar and was so heavy that he was frustrated.

So they got the frame from a big bike, combined gears from a racing bike, brakes from a motorcycle, combined different materials.

First, for the first three to five years after they were born, mountain bikes were known as "ponkotsu."

And they're mostly made in Northern California's biker community.

Then one of the companies that used to import junk car parts decided to go into business and start selling to others, and from there gradually another company emerged, Marine. It took maybe 10, maybe 15 years for the big bike companies to realize the market existed.

Thirty years later, mountain bike sales and mountain bike equipment account for 65 percent of US bicycle sales.

That's $58 billion.

This is a completely consumer-generated category that would not have been created in the mainstream bike market because they didn't see the needs and opportunities. They had no incentive to innovate.

What I disagree with about Yochai's presentation is when he says the internet activates the ability to distribute innovation.

That's when the internet connects with this kind of knowledgeable, passionate pro-am consumer. They have the motive to innovate. they have the tools They want to make this kind of explosive creative collaboration happen.

From there we see the need for things like Jimmy was talking about, our new kind of organization, or better put it, how we organize ourselves without an organization.

It is now possible. You don't have to organize an organization to accomplish a large and complex task such as innovating a new software program.

So this is a big challenge to our way of thinking that creativity is born.

A traditional view that still persists in many of our ideas about creativity in organizations and governments is that creativity is about special people. Put your baseball cap on backwards, attend conferences like this, come to special places, elite universities, R&D labs in the woods, waterworks, corporate suites painted in funny colors, beanbags, weird foosball tables, and so on.

When special people, special places come up with special ideas, you have a pipeline that delivers those ideas to waiting, passive consumers.

They can say yes or no to inventions.

That's the idea of ​​creativity.

If you were a government official or run a large company, what policies would you recommend?

More special people, more special places.

Build a creative cluster in your city. Creating more R&D parks, etc.

Extend your pipeline to consumers.

Well, I think this view is getting more and more wrong.

I think it was always wrong. Because I think creativity has always been very collaborative and probably mostly interactive.

But it's getting more and more wrong, and one of the reasons it's wrong is that ideas are reversing the pipeline.

Ideas come back from consumers, but they are often ahead of producers.

why is that?

One of the problems is that there is a great deal of uncertainty associated with any fundamental innovation that comes up with an idea that impacts a large number of technologies and people.

Where uncertainty is the highest, innovation pays off the most.

And even when we have a fundamental innovation, there is often great uncertainty about how it can be applied.

The entire history of the phone is a story of dealing with that uncertainty.

The inventors thought that the very first landline phones would be used for people to listen to live performances from West End theaters.

When cell phone companies invented SMS, they had no idea what it was for. It wasn't until the technology got into the hands of teenage users that they invented how to use it.

So the more radical the innovation, the more uncertainty there is, and the more innovation is needed to figure out what the technology is for.

All our patents, and our entire approach to patents and inventions, are based on the idea that the inventor knows the purpose of the invention. You can say what it is for.

More and more often the inventor of things fails to say it in advance.

It will be resolved during use in cooperation with the user.

We believe that invention is a kind of moment of creation. There is a moment of birth when someone comes up with an idea.

The truth is that most creativity is cumulative and collaborative. Like Wikipedia, it evolves over time.

The second reason users are becoming more and more important is that they are the source of great disruption.

If you want to find big new ideas, they are often hard to find in mainstream markets and large organizations.

And look inside a large organization and you'll see why.

So you are in a big company.

You are clearly keen to climb the corporate ladder.

Would you go to a board meeting and say, "I have a great idea for an early product in a marginal market that's going to consumers we've never dealt with before. I don't know if it's going to be very profitable, but it could be really big in the future."

No, what you're doing is saying, ``I have a great idea to incrementally innovate an existing product that we're selling to existing users through existing channels.

Large companies have built-in tendencies that reinforce past successes.

They've sunk so much into it that it's very hard to find emerging new markets. Emerging new markets are therefore hotbeds of enthusiastic users.

Best example: Who in the music industry 30 years ago would say, ``Yeah, let's invent a musical form for a ghetto, fortune-hunted black man to express his dissatisfaction with the world in a musical form that many find difficult to hear at first.''

It sounds like a winner. we go with that. ”

(laughter).

So what happens? Rap music is created by users.

They do it with their own tapes and their own recording equipment. They distribute it themselves.

Thirty years later, rap music has become a dominant musical form in pop culture, but it would never have come from a big company.

This is my third point -- I had to start with the pro-ams.

That's the term I used in my work with the London think tank Demo. So we've been looking at people who are amateurs, people who do what they love but who want to do it to a very high standard.

And across all disciplines, from software, astronomy, natural sciences, to kitesurfing and other vast areas of leisure and culture, there are people who want to do it because they love it, and they want to do these things to a very high standard.

They work their own hours if you want.

They take their leisure time very seriously and master their skills. they invest their time. They use not only the Internet, but also increasingly cheap technologies such as cameras, design technology, leisure technology and surfboards.

Globalization has made a lot of such equipment significantly cheaper.

Consumers will become more knowledgeable, educated, and able to connect with each other and do things together.

In that sense, consumption is an expression of their productive potential.

The reason people are interested in this is because they don't often express their emotions at work.

They start this kind of activity because they don't feel like they're doing something that's really important to them.

This has an organizational impact on very wide areas of life.

Take astronomy, which Yochai already mentioned, as an example.

Twenty or thirty years ago, only big professional astronomers with very large telescopes could see the far reaches of space.

There is a large telescope called Jodrell Bank in the north of England, and when I was a child I thought it was amazing.

And it was huge, it was really huge.

Six amateur astronomers are now working with the internet, the nearly open-source Dobsonian Digital Telescope, several light sensors developed over the last decade, and the internet to do what Jodrell Bank could only do 30 years ago.

Here in Astronomy, new production resources are exploding.

A user can be a producer.

So what does this mean for our organizational context?

Well, for now, imagine that the world is divided into two camps.

Here we have the old traditional corporate model of special people, special places. Patent it and send it down the pipeline, primarily to eager and reluctant consumers.

Now imagine we have Wikipedia, Linux, and other open source.

This is open. This place is closed.

This is new; this is traditional.

The first thing I can say with certainty is what Yochai has already said. So, there is a big struggle between these two organizational forms.

The people over there will do everything in their power to prevent this type of organization from succeeding. because they are under threat.

Arguments about copyrights, digital rights, etc., in my view, are all about stifling this kind of organization.

What we are seeing is a complete corruption of the concept of patents and copyrights.

Intended to be a way of encouraging invention, a way of regulating the spread of knowledge, these techniques are increasingly being used by large corporations to create mountains of patents to prevent innovation from happening.

Let me give you just two examples.

The first is to go to a venture capitalist and say, 'I have a great idea.

I have invented this wonderful new program that is far superior to Microsoft Outlook. ”

Would any sane venture capitalist give you money to use Microsoft Outlook to found a venture to compete with Microsoft?

That's why competition with Microsoft should only come from open source kind of projects.

So there is a big competitive debate about preserving the capacity for open source and consumer-driven innovation. Because it is one of the greatest means of competition against monopolies.

There will also be a lot of professional discussion.

Because the specialists in this closed organization may be academics. They may be programmers. they may be doctors. They may be journalists - my former profession - but they may say, "No, no, I can't trust these people."

When I started my career in journalism, 20 years ago, at the Financial Times. It was very, very exciting to see someone reading a newspaper.

And it's like looking over your shoulder at the tube to see if they're reading your article.

Usually, they're reading stock prices, and there's a scrap of paper with your article on the floor or something like that, and they're like, "Oh my god, what are they doing!"

They didn't read my great article! ”

And we have allowed users, readers, two places where they can contribute to the newspaper. It's a letter page. A letter could be written there and we cut it in half in their honor and printed it three days later.

Alternatively, an editorial page allows editors to write to them if they know them, went to school with them, and slept with their wives.

Those were the two places.

Shock, Horror: Now readers want to be authors and publishers.

That's not their role. They should read what we write.

But they don't want to be journalists. Journalists think bloggers want to be journalists. They don't want to be journalists. They just want to speak up.

As Jimmy said, they want dialogue, conversation.

They want to join that flow of information.

What's happening there is that the whole realm of creativity is expanding.

So there will be a big fight.

But there will also be a big move from open to closed.

I think there are two important things you'll see. These are, I think, two challenges for the open movement.

The first is whether volunteers can really make a living.

If this is so important, shouldn't it be funded, organized and supported in a more systematic way?

I think the idea of ​​setting up a Red Cross to provide information and knowledge is a great idea, but can volunteers really organize it?

What changes in public policy and funding are needed to make this possible?

For example, what role does the BBC play in that world?

What is the role of public policy?

And finally, I think you'll find that intelligent, closed organizations are moving in an increasingly open direction.

So it won't be a competition between the two factions, but between the factions you will find all sorts of interesting places for people to occupy.

New organizational models are emerging that combine closed and open in tricky ways.

It wouldn't be so clear. It's not Microsoft vs Linux, there will be all sorts of things in between.

And these organizational models will turn out to be incredibly powerful, and those who can understand it will be very successful.

Let's take one last example of what that means.

I was in Shanghai, in an office block built on what used to be rice paddies five years ago. It is one of 2,500 skyscrapers built in Shanghai in the last decade.

And I was having dinner with a guy named Timothy Chan.

Timothy Chan founded his internet business in 2000.

I decided not to go to the Internet, save money and play computer games.

He runs a company called Shanda, China's largest computer game company.

It has 9,000 servers across China and 250 million subscribers.

Four million people are playing one of his games at any given time.

How many people does he employ to serve that population?

500 people.

So how can you serve 250 million people from 500 employees?

Because basically he doesn't serve them.

he gives them a platform. He gives them some rules. He kind of gives them the tools and then coordinates the conversation. he directs the action.

But in reality, much of the content is created by users themselves.

And it creates a kind of stickiness between the community and the company, which is really, really powerful.

The best way to do that is to join one of his games and create a character that develops over the course of the game.

If for any reason your credit card becomes invalid or any other problem occurs, your character will be lost.

You have two options.

One option: you can create a new character from scratch, but without any player history.

It costs about $100.

Or you can get on a plane, fly to Shanghai, line up outside Shanda's office -- probably $600, $700 -- and reclaim your personality, reclaim your history.

Every morning, 600 people line up outside the office to retrieve these characters. (Laughter) This is about a company that builds on the community and provides the community with tools, resources, and a platform to share.

He's not open source, but he's very powerful.

I think this is one of the challenges for people like me who do a lot of work with government.

If you're a game company and your game has 1 million players, only 1% of them need to be co-developers and contribute ideas, and you have 10,000 people in development.

Imagine getting all the children in the UK involved in education and 1 percent of them co-inventing education.

So what happens to the resources available to the education system?

Or let the 1% of NHS patients be co-producers of health in a way.

The reason these open models still start to emerge at an alarming rate, despite all efforts to curtail, limit and curb them, is that they double our resources of production.

And one of the reasons they do so is because it turns users into producers and consumers into designers.

thank you very much.

Today we will talk about other people's heart problems.

And the question I'm about to talk about is not the well-known philosophical question, "How can you know if another person has a mind?"

So you may be intelligent, but everyone else is just a convincing robot.

This is a philosophical question, but for today's purposes I'll assume that many in this audience have hearts and don't need to worry about this.

The second problem is perhaps even more familiar to us as parents, teachers, spouses, and novelists. "Why is it so hard to know what other people want or believe?"

Or, perhaps a more appropriate question, "Why is it so hard to change what other people want or believe?"

I think novelists best describe this.

As Philip Roth said, "But what shall we do about the work of others of this great importance?"

We are all so incapable of imagining each other's inner workings and unseen purpose. ”

So, as a teacher and as a spouse, this is of course an issue I face every day.

However, as a scientist, I am interested in another issue concerning the minds of others, and that is the issue I will introduce today.

And the question is, "How is it so easy to know the minds of others?"

So to start the illustration, very little information is needed to guess what this woman is thinking, or what this man is thinking. Just one snapshot of a stranger.

Put another way, the crux of the problem is that the machine we use to think about other minds, our brain, is made up of fragments, brain cells, that we share with all other animals, monkeys and mice, and even sea slugs.

Still, if you put them together in a certain network, you get the ability to write Romeo and Juliet.

Or, as Alan Greenspan said, "I know you think you understand what I said, but I'm not sure you understand that what you heard wasn't what I meant."

(Laughter) So my job in cognitive neuroscience is to keep one of these ideas in each hand.

And to try to understand how simple units, simple messages can be put together in networks across time and space to acquire this amazing human ability to think about the mind.

So today I'm going to talk about three things about this.

Obviously the whole project here is massive.

And I'd like to tell you just the first few steps of discovering a special brain region for thinking about other people's thoughts.

In learning how to do this difficult job, I observed some slow development of this system.

And finally, we show that some of the differences in how people judge others can be explained by differences in this brain system.

First of all, I would like to say that there is a brain region in the human brain whose job is to think about other people's thoughts.

This is the photo.

It is called the right temporoparietal junction.

Above and behind the right ear.

And this is the area of ​​the brain that I used when I saw the picture I showed you, or when you read Romeo and Juliet, or when you tried to understand Alan Greenspan.

Nor do we use it to solve other kinds of logical problems.

Therefore, this brain region is called the right TPJ.

And this picture shows the average activation in a group of so-called typical adults.

They are undergraduates at MIT.

(Laughter) The second thing I want to say about this brain system is that we human adults are very good at understanding other people's minds, but that hasn't always been the case.

It takes a long time for children to break into the system.

I'll give you a little introduction to that long, long process.

The first thing I'm going to show you is the change from 3 to 5 years old. Children come to understand that others may have different beliefs than they do.

So here's a 5-year-old solving a standard kind of puzzle that we call a false belief task.

Rebecca Sacks (video): This is the first pirate. His name is Ivan.

And do you know what pirates really like?

Child: What? RS: Pirates love cheese sandwiches.

Child: Cheese? I love cheese!

RS: Yes. So Ivan ate this cheese sandwich and said, "Yum yum yum yum!"

I love cheese sandwiches. ”

And Ivan puts the sandwich right here on the pirate box.

Then Ivan said, "Look, I need a drink with my lunch."

So Ivan goes to buy a drink.

And while Ivan is away, the wind picks up and blows the sandwich onto the grass.

And now another pirate is coming.

This pirate is called Joshua.

And Joshua loves cheese sandwiches too.

So Joshua had a cheese sandwich and said, "Yum yum yum yum! I love cheese sandwiches."

And he puts a cheese sandwich on a pirate box here.

Child: So that's his.

RS: That's Joshua's. That is correct.

Child: And he fell to the ground.

RS: Exactly.

Child: So he won't know which one is his.

RS: Oh. So Joshua goes to get a drink.

Ivan came back and said, "I want a cheese sandwich."

So which one do you think Ivan will take?

Child: I think he's going to take it.

RS: Yeah, do you think he'll get it? have understood. let's see.

oh yeah, you were right. he received it.

So this is a 5-year-old who clearly understands that others may have false beliefs and what consequences his actions may have.

Now let's meet a 3-year-old who solved the same puzzle.

RS: And Ivan says, "I want a cheese sandwich."

Which sandwich is he going to take?

do you think he will get it? Let's wait and see.

Let's see what he does. Ivan has arrived.

And he said, "I want a cheese sandwich."

and he receives this.

Uh oh. why did he pick it up?

Child: He was on the lawn.

So 3 year olds do two different things.

First, he predicts that Ivan will receive a sandwich that is actually his.

And second, seeing Ivan take the sandwich he left where he left it, you could say he's taking it because he thinks it's his, but the 3-year-old comes up with another explanation: He doesn't have his sandwich because he doesn't want it, because it's dirty on the ground now.

That's why he eats another sandwich.

Of course, development doesn't end in five iterations.

And by raising the bar and asking children to make moral judgments rather than predictions of behavior, we see this process of learning to think about what others think continues.

So, first, let me introduce the 3-year-old again.

RS.: So Ivan is mean and mischievous for taking Joshua's sandwich?

Child: Yeah.

RS: Should Ivan get in trouble for taking Joshua's sandwich?

Child: Yeah.

So it might not be surprising to think that it was Ivan's spite that he took Joshua's sandwich, as he thinks he only took Joshua's sandwich so that Ivan wouldn't have to eat his own dirty sandwich.

But this time I will introduce a 5-year-old child.

Remember, a five-year-old perfectly understood why Ivan took Joshua's sandwich.

RS: Was Ivan mean and mischievous in taking Joshua's sandwich?

Child: Hmm, yes.

Therefore, it is not until the age of 7 that we get adult reactions.

RS: Should Ivan get in trouble for taking Joshua's sandwich?

Child: No, if the wind blows, it will be a disaster.

He says wind should be a problem to switch sandwiches.

(Laughter) And now what we've started doing in my lab is putting kids in brain scanners and asking them what's going on in their brains as they develop their ability to think about other people's thoughts.

The first is that this same brain region, the right TPJ, is seen being used when children are thinking about other people.

But it is completely different from the adult brain.

So, in adults, as I just said, this area of ​​the brain is almost completely specialized and does little more than think about other people's thoughts, but in children it's less specialized when you get to the age range of 5 to 8 that I just gave you.

In fact, when you look at 8- to 11-year-olds entering early puberty, they still don't have the brain regions that adults do.

And what we can see is that from childhood to adolescence, both the cognitive system, the mind's ability to think about other minds, and the brain systems that support it, continue to develop slowly.

But of course, as you probably know, even as adults, people differ in how good they are at thinking about other people's minds, how often and how accurately they do so.

What we wanted to know was whether this difference in brain regions could explain the differences in how adults think about other people's thoughts.

So the first thing we did was give adults the version of the pirate problem that we gave kids.

And now I give it to you.

There, Grace and a friend are touring a chemical factory and take a coffee break.

And Grace's friend asks for sugar in her coffee.

Grace goes to make coffee and finds a pot with white powder, which is sugar, next to the coffee.

However, the powder is labeled "venomous", so Grace believes it is poisonous.

And she puts it in her friend's coffee.

Her friend is drinking coffee and is fine.

How many people think it is morally permissible for Grace to put powder in her coffee?

have understood. good. (Laughter) So we ask people, how much blame should Grace have in this incident that we call a failed attempt to harm?

And then you can compare it to another case where everything is the same in the real world.

The powder is still sugar, but the difference is Grace's idea.

Now she thinks the powder is sugar.

And, perhaps unsurprisingly, if Grace puts the powder in her friend's coffee thinking it's sugar, people say she doesn't deserve blame at all.

If she thought the powder was poison, even though it was actually sugar, people say she deserved a lot of blame, even though what happened in the real world was exactly the same.

And indeed, they argue that she should be blamed more for this failed attempt to harm than for another incident that we call an accident.

Grace thought the powder was sugar because it was labeled "sugar" on the coffee machine, but it was actually poison.

So if the friend drank the coffee and died, even though the powder was poison, people say that this case where Grace innocently thought it was sugar should be blamed less than the others where she thought it was poison and did no harm.

However, people have slightly different opinions about how much responsibility Grace should take in this accident.

Some think she deserves more blame, others don't.

What I'm going to show you is what happens when people look inside their brains while they're making that decision.

So what I'm showing is, from left to right, how much activity there was in this brain region, and from top to bottom, how much blame people said Grace deserved.

And as you can see, when there was little activity in this brain region on the left side, people paid little attention to her belief in her innocence and said she deserved a lot of responsibility for the accident.

On the more active right side, however, people focused more attention on her belief in her innocence, arguing that she was much less responsible for causing the accident.

That's good, but of course, what we'd like to see is whether there are ways to interfere with the functioning of this brain region and change people's moral judgments.

And we have such tools.

This is called transcranial magnetic stimulation (TMS).

This is a tool that sends magnetic pulses through someone's skull into a small area of ​​the brain, temporarily disrupting the function of neurons in that area.

So let me show you a demo of this.

First, we show that this is a magnetic pulse.

Let me show you what happens when you put a quarter on the machine.

When you hear a click, the machine will power on.

So now I'm going to apply the same pulse to my brain, the part of my brain that controls my hands.

So there are no physical forces, only magnetic pulses.

Woman (video): Are you ready, Rebecca? RS: Yes.

Applying a magnetic pulse to the brain causes small involuntary contractions in the hand.

And we can ask if the same pulse can be applied to RTPJs now to change people's moral judgments.

So these are the judgments I indicated earlier, the normal moral judgments of people.

Then we can apply TMS to RTPJ and ask how people's judgments change.

First of all, people are still able to perform this entire task.

So their judgment if all was well remains the same. They say she deserves no blame.

But if they try to do harm and fail and Grace thinks it's poison when it's really sugar, people say it's rather okay now, and that Grace shouldn't be so blamed for putting the powder in her coffee.

And in the case of an accident that caused a fatality because she thought it was sugar but was actually poison, people say it doesn't matter so much and she should be blamed more.

What I have told you today is that people actually have a special ability to think about other people's thoughts.

We have a special brain system that allows us to think what other people are thinking.

This system takes a long time to develop slowly through childhood and early adolescence.

And even in adulthood, differences in this brain region may explain differences in how adults think and judge others.

But I would like to return the last words to the novelists and to Philip Roth. He concluded:

It misunderstands that they are alive.

Wrong, wrong, wrong, then carefully reexamined and wrong again. ”

thank you.

(Applause) Chris Anderson: So I have a question. When you start talking about using magnetic pulses to change people's moral judgments, it sounds alarming.

(Laughter) Tell me you're not getting calls from the Department of Defense.

RS: It's not.

I mean, they're calling, but I don't answer the phone.

(laughs) CA: Are you really calling?

So seriously, you sometimes have to wake up at night and lie down wondering where all this work is leading up to.

I mean, you're obviously a great human being, but someone could use this knowledge to do things in future non-torture chambers that people here worry about.

RS: Yes, we are concerned about this.

I have a few things to say about TMS.

One is that you may unknowingly have TMS.

So it's not a secret technique.

In fact, it is very difficult to achieve such very small changes.

The changes I have shown you are impressive to me because they tell us about how the brain functions, but they are small in relation to the scale of the moral judgments we actually make.

And what we have changed is not the moral judgment people make when they decide what to do, when they make a choice of action.

We changed their ability to judge the actions of others.

So I think what I'm doing is not studying criminal defendants, but jurors.

CA: Will your work lead to any recommendations in education to raise children, perhaps a generation of more fair moral judgments?

RS: It's one of the idealistic wishes.

The whole research program here, studying the characteristic parts of the human brain, is completely new.

Until recently, anything we knew about the brain could be studied in animal models because it could be done in other animal brains.

We knew how the brain sees, controls the body, hears and feels.

And the whole project of understanding how the brain does things that are peculiar to humans, learning languages ​​and abstract concepts and thinking about other people's thoughts, is completely new.

And I still don't know what impact understanding that has.

CA: So I have one last question. There is something called the hard problem of consciousness that baffles many.

Perhaps a concept that allows us to understand why the brain works.

But why should anyone feel anything?

Why do we seem to need these sensing beings to operate?

You are a brilliant young neuroscientist.

I mean, how likely are you, or someone else, to come up with a paradigm shift in understanding a seemingly impossible problem at some point in your career?

RS: I hope so. And I think probably not.

K: why?

RS: It's not called the hard problem of consciousness for no reason.

(laughs) CA: Great answer. Thank you so much Rebecca Sachs. It was great.

(applause)

Over 3,000 years ago, flowers began appearing in ancient Egyptian medical texts as remedies.

Across the Mediterranean, the ancient Minoans probably found ways to use the same plant for uplifting.

Both ancient civilizations were on to something. Opium, the extract of the poppy in question, can cause pleasure and reduce pain.

Although opium has been used ever since, it was not until the 19th century that one of its compounds, morphine, was identified and isolated for medical use.

Morphine, codeine, and other substances made directly from the poppy are called opiates.

In the 20th century, pharmaceutical companies created many synthetic analogues of these opiates, including heroin, hydrocodone, oxycodone, and fentanyl.

Whether synthetic or derived from opium, these compounds are collectively known as opioids.

Whether synthetic or natural, legal or illicit, opioid drugs are highly effective pain relievers, but they are also highly addictive.

In the 1980s and 90s, pharmaceutical companies began aggressively marketing opioid pain relievers, actively downplaying their addictive potential to both the medical community and the public.

The surge in prescriptions for opioid painkillers and the surge in cases of opioid addiction began a crisis that continues to this day.

To understand why opioids are so addictive, it helps to track how these drugs affect the human body, from the first dose to repeated use and what happens when long-term use is discontinued.

Although each of these drugs is chemically slightly different, they all work on the body's opioid system by binding to opioid receptors in the brain.

Endorphins in the body reduce pain signals by binding to these receptors, and opioid drugs bind stronger and longer.

Therefore, opioid drugs can deal with pain much more severely than endorphins.

Opioid receptors affect everything from mood to normal bodily function.

The binding strength and durability of opioids, including these functions, mean that their effects are more pronounced and widespread than those of the body's natural signaling molecules.

When the drug binds to opioid receptors, it triggers the release of dopamine. Dopamine leads to pleasure and may be responsible for the euphoria characteristic of opioid high.

At the same time, opioids suppress the release of noradrenaline, which affects alertness, respiration, digestion, and blood pressure.

At therapeutic doses, noradrenaline is reduced enough to cause side effects such as constipation.

Higher doses of opioids can lead to dangerously slow heart and breathing rates, which can lead to unconsciousness and death.

Over time, the body begins to develop a tolerance to opioids.

The number of opioid receptors may decrease or the receptors may become less reactive.

To experience the same dopamine release and consequent mood effects as before, people need to consume increasingly large doses of dopamine, and this cycle leads to physical dependence and addiction.

As people take more opioids to compensate for their tolerance, norepinephrine levels drop more and more, dropping to levels that can affect basic bodily functions.

The body compensates by increasing the number of noradrenaline receptors, allowing it to detect smaller amounts of noradrenaline.

This increased sensitivity to noradrenaline allows the body to continue functioning normally. In fact, the body becomes dependent on opioids to maintain a new balance.

When people who are physically dependent on opioids suddenly stop taking opioids, that balance is thrown off.

Noradrenaline levels may rise within a day of stopping opioid use.

But it takes much longer for the body to get rid of all the extra noradrenergic receptors it makes.

This means that there is a period of time when the body becomes hypersensitive to noradrenaline.

This hypersensitivity causes withdrawal symptoms such as muscle aches, abdominal pain, fever and vomiting.

Opioid withdrawal, although temporary, can be incredibly debilitating.

In severe cases, withdrawal symptoms may last for days or weeks.

People addicted to opioids don't necessarily use drugs to get high, they use them to avoid getting sick.

Many are at risk of losing their wages or even their jobs during withdrawal, or may have no one to care for them during withdrawal.

The risk of overdose may be particularly high if someone later returns to using opioids. What should have been standard doses while well tolerated can now be lethal.

Since 1980, there has been a sharp increase in accidental deaths from opioid overdoses in the United States and an explosion in opioid addiction worldwide.

Although prescriptions for opioid analgesics are becoming more tightly regulated, cases of overdose and addiction are still increasing, especially among young people.

Many of the early addicts were middle-aged people who became addicted to prescription pain relievers or pain relievers they received prescriptions for from friends and family.

Today, young people are often introduced to prescription opioid drugs in that way, but they are moving to heroin and illicit synthetic opioids, which are cheaper and more readily available.

Beyond tighter regulation of opioid pain relievers, what can be done to reverse the rising rates of addiction and overdose?

A drug called naloxone is currently your best defense against an overdose.

Naloxone binds to opioid receptors but does not activate them.

It blocks other opioids from binding to their receptors and may even knock opioids out of their receptors to reverse an overdose.

Opioid addiction is rarely an isolated disease. In many cases, people with opioid addiction also struggle with mental health conditions.

There are inpatient and outpatient programs that combine medication, medical services, and psychotherapy.

However, many of these programs are quite expensive, and more affordable options can have long waiting lists.

Also, complete detoxification of opioids is often required before starting treatment.

Neither the period of withdrawal nor the typical months of institutional stay may be possible for people who risk losing their jobs or housing during that period.

Opioid maintenance programs combine medication and behavioral therapy to address some of these disorders and aim to eliminate opioid abuse.

These programs avoid withdrawal symptoms from drugs that bind to opioid receptors, but do not have the psychoactive effects of painkillers, heroin, and other commonly abused opioids.

Methadone and buprenorphine are the main opioid maintenance drugs currently available, but although no special training or qualifications are required to prescribe opioid pain relievers, physicians require special exemptions to prescribe them.

Buprenorphine is so rare that there is also a growing black market.

Although there is still a long way to go in the fight against opioid addiction, there are great resources for understanding treatment options.

If you or someone you know is struggling with opioid use in the United States, the Department of Health and Human Services operates a helpline: 800-662-4357 and a database of over 14,000 substance abuse facilities in the United States: www.hhs.gov/opioids.

The Sun Lord ushers in the dawn of the day called the Seven Monkeys, and his fingers slowly spread a rosy glow, blending softly with the smoke that rises from the fires of Tenochtitlan's many hearths.

Shoquatri, a midwife, faces a difficult choice.

A major transition from the wet season to the dry season is underway.

The gods have continued to feed the people with corn all summer long, but the fertile summer season is fading away.

The day is celebrated during festivals that mark the transition between the summer season, when the gods give food to people, and the winter season, when people give back to the gods.

Shokoutri is indebted to the central figure of the festival, the female warrior goddess, Patron Teteoinnan.

The Teteoinan wage war on both the female native battlefields and against male Tenochtilan enemies.

She must be kept happy or she will bring bad luck.

A midwife should attend today's festivities, but one of her patients may be about to go into labor.

Socuoutri decided to check on the patient first.

Expectant mothers have never worked too hard, chewed gum, or lifted heavy weights.

her family takes care of her.

Sure, Xoquauhtli can take some time to honor her goddess.

She leaves it to her apprentice and heads to the center of town.

Along the way, she saw women cleaning the roads and hanging gourds in preparation for the festival.

Finally she reaches the Great Pyramid.

There are two temples on the summit. The north temple holds a ceremony to worship the god of rain in the summer, and the south temple holds a ceremony to worship the god of war in the winter.

On the vernal equinox, the sun rises between the two sides.

The ceremony begins with a mock battle between the midwife and other doctors.

Teams of Xokuoutli fight fiercely, throwing balls made of nocturnes, marigolds, reeds and moss.

They joke, call their rivals by name, and laugh.

But then a girl comes running with a message for Shoquatri.

Her patient is in labor!

She rushes home.

All old women from a large family have already gathered for the birth. Their experience is invaluable if something goes wrong.

She prepares herself with a prayer that honors her most important instrument: her fingers.

She then administered chihuapatri to the patient to help expel the baby, massaged her with a sweathouse, and rubbed her stomach with tobacco.

She offered Teteoinnan a short prayer and encouraged her patients to act like warriors.

The old ladies let out a triumphant cry as the mighty baby girl slides into her waiting hands.

Sokoutri takes a few drops of water from a jade bowl, blows on it, and places it on the baby's tiny tongue.

She calls her a precious green stone, a little warrior, and tells how the Lord and Lady of the Ninth Sky breathed life into her and sent her to this place of burden and suffering.

She then turns to her new mother and praises her for acting like an eagle warrior, a jaguar warrior.

By the time it ends, it is late at night and the flames of the fire are extinguished.

Sokuoutri piles the remaining hot coals in the center of the hearth and burns them to keep them burning.

She puts the baby in a woven basket and turns her head towards the warm fire.

This warms the Tonali, the body's vital 'soul' center, central to health and well-being.

It's already midnight. If Mr. Shokoutri hastened, he could return to the temple for the climax of the festival.

She makes her way to the city center, where the priest carries the woman on his back to the top of the pyramid.

She is decapitated to start a new season and feed the gods. This symbolizes how corn is cut in the field.

After that, she was reborn as Mrs. Teteoinan and oversaw the recruitment of new warriors.

TED stars, these are tough economic times. These are really tough economic times.

So I'd like to cheer you up with one of the little-known commercial success stories of the last 20 years.

It rivals the work of Microsoft and Google in a very peculiar way.

And this industry has calmly dealt with the current recession.

I am referring to organized crime.

Now, you say organized crime has been around for a very long time, and that would certainly be a wise word.

However, it has experienced unprecedented growth over the past two decades and now accounts for around 15 percent of global GDP.

I like to call this the "Global Shadow Economy", or "McMafia" for short.

So what caused this extraordinary rise in transnational crime?

Of course there's globalization, technology, communications, etc., but we'll talk about that a little bit later.

But before that, I would like to return to this event of the fall of communism.

Across Eastern Europe, one of the most significant episodes in post-war history took place.

Now is the time for full disclosure.

This event meant a lot to me personally.

As a teenager, I started smuggling books across the Iron Curtain to Eastern European anti-democracy groups such as Solidarity in Poland.

Then I started writing about Eastern Europe and eventually became the BBC's Eastern Europe correspondent, which I did in 1989.

So when 425 million people finally won the right to choose their own government, I was overjoyed, but a little worried about something more nasty lurking behind the wall.

For example, it didn't take long for ethnic nationalism to rise to a bloody head in Yugoslavia.

And in the turmoil, in the midst of the euphoria, it took me a while to realize that some people who held power in Eastern Europe before 1989 continued to do so after the revolution there.

I'm sure there are characters like that.

But there were also more unexpected people who played an important role in what was happening in Eastern Europe.

like this character. Do you remember these people?

They had gold medals in weightlifting and wrestling at the Olympics every four years, were great communist celebrities, and had a great lifestyle that came with communism.

They got great apartments in the city centre, easy sex, and freedom to travel west. This was a great luxury at the time.

Surprisingly enough, they played a key role in the emergence of market economies in Eastern Europe.

Or, as I like to call them, they are capitalist midwives.

Here are some of the same weightlifters transformed in 1989.

Now in Bulgaria -- this photo was taken in Bulgaria -- when communism collapsed across Eastern Europe, it wasn't just communism. The country has also collapsed.

So the police weren't working.

The court system was not functioning properly.

So what were the businessmen of the brave new world of Eastern European capitalism going to do to ensure that their contracts were honored?

Well, he ended up turning to what sociologists have called, quite prosely, the privatization of law enforcement.

We want to know them as mafia.

And in Bulgaria, the mafia soon joined the 14,000 people who were laid off from security service jobs between 1989 and 1991.

Now, when the state is collapsing and the economy is going south at breakneck speed, what you most want in the labor market is 14,000 men and women who are mainly good at surveillance, smuggling people, building underground networks, and killing people.

But that's what happened across Eastern Europe.

Now, when I worked in the 1990s, I spent most of my time covering the horrific conflicts in Yugoslavia.

And I couldn't help but realize that the people carrying out that horrific atrocity -- the militia -- are actually the same people who run the organized crime syndicate.

And I've come to believe that behind the violence lies sinister criminal activity.

So I decided to travel the world to investigate this global criminal underworld, talking to police officers, victims, and consumers of illegal goods and services.

But above all, talk to the gang themselves.

And the Balkans were a great place to start.

why? Of course, there was also the issue of the breakdown of law and order, but as they often say in retail, it's also place, place, place.

And when I started my research, I realized that the Balkans had become a vast transit zone for illegal goods and services from all over the world.

heroin, cocaine, women trafficked for prostitution, and precious minerals.

And where were they going?

By this time, the European Union was beginning to reap the benefits of globalization, eventually transforming it into the richest consumer market in history, with some 500 million people.

And a sizable minority of that 500 million prefer to spend their leisure time and some of their surplus cash sleeping with prostitutes, poking €50 bills up their noses and hiring illegal immigrant workers.

Today, organized crime in a globalized world operates like any other business.

There are production areas such as Afghanistan and Colombia.

It is distributed in areas such as Mexico and the Balkan Peninsula.

And, of course, there are consumption regions like the European Union, Japan, and of course the United States.

Zones of production and distribution are often located in developing countries and are often threatened with horrific violence and bloodshed.

Consider Mexico, for example.

Over the past 18 months, 6,000 people have died as a direct result of cocaine trading.

What about the Democratic Republic of the Congo?

Since 1998, 5 million people have died there.

This is not the conflict you read about in the newspapers, but it is the biggest conflict on the planet since World War II.

Why? Because mafias around the world are working with local militias to expropriate the region's rich mineral resources.

In 2000, 80 percent of the world's coltan was sourced from slaughterhouses in the eastern Democratic Republic of the Congo.

Well, coltan is on almost every mobile phone, almost every laptop and game console.

The Congolese warlords sold it to the Mafia in exchange for weapons, and the Mafia sold it to the Western market.

And it is this Western desire to consume that is the main driving force behind transnational organized crime.

Now, let me show you some of my friends smuggling duty-free cigarettes, conveniently filmed by the Italian police.

Now factory cigarettes are very cheap.

The European Union then imposes on them the highest taxes in the world.

Therefore, if these groups could be smuggled into the EU, the profits would be enormous. I'd like to show this to show what kind of resources these groups have available.

This boat is worth one million euros new.

And it is the fastest in European waters.

Starting in 1994, 20 boats sailed across the Adriatic Sea from Montenegro to Italy every night for seven years.

And Britain alone lost $8 billion in revenue as a result of this trade.

And instead, the money was used to underwrite the war in Yugoslavia and enrich the pockets of unscrupulous individuals.

Well, when this deal started, the Italian police had only two boats that could go at the same speed.

And this is very important. Because the only way you can catch them is if they run out of gas.

Sometimes gangs would bring in women being trafficked into prostitution, and when the police intervened, they would throw the women into the sea so that rather than go after the bad guys, the police would have to go and save the drowning women.

So I'm showing you this to show you how many boats, how many ships it takes to catch these guys.

The answer is 6 ships.

And remember, 20 of these speedboats were coming across the Adriatic every night.

So what were they doing with the money they earned?

Well, here we come to globalization. Because it is not just a deregulation of world trade.

It was the liberalization of international financial markets.

Has that made money laundering easier?

The last 20 years have been the era of champagne for dirty money making.

In the 1990s, financial centers around the world were competing for business, but there were no effective mechanisms to prevent money laundering.

And many legitimate banks were also willing to accept deposits from highly questionable sources without question.

But at its core is the offshore banking network.

These things are now an important part of the money laundering parade and must be eliminated if illegal tax evasion, international organized crime and money laundering are to be eradicated.

The good news is that we finally have someone in the White House who is consistently speaking out against these corrosive entities.

And if anyone has any concerns about what I think about the need for new laws, regulations, and effective regulation, take a look at Bernie Madoff, who is going to spend the rest of his life in prison, I say.

Bernie Madoff stole $65 billion.

So he's on the gangster Olympus with the Colombian cartels and major Russian crime syndicates, but he's been doing this for decades in the very heart of Wall Street, and regulators haven't picked it up.

So how many other Madoffs are there on Wall Street and the City of London fleeing the common people and money laundering?

Well, let me tell you, that's quite a few.

Now let's move on to 101 on transnational organized crime.

And it's a drug. The second photo of the marijuana farm this morning.

However, this is in central British Columbia where I filmed.

This is one of tens of thousands of single-mother farming projects in British Columbia.

This means that more than 5% of the state's GDP will be accounted for by this trade.

Now, I was taken by Inspector Brian Cantera of the Royal Canadian Mounted Police to a cavernous warehouse east of Vancouver to see some of the merchandise the RCMP routinely seize from smugglers. These goods are, of course, sent to the American South, where B.C. has an insatiable market. It's called "Bud", partly because it's marketed as organic, and of course it's very popular in California.

(Laughter) (Applause) Now, even if the police admit it, this doesn't really affect the profits of major exporters.

Since the beginning of globalization, the world drug market has expanded significantly.

However, there was no corresponding increase in the resources available to the police.

But this may all be about to change as something very strange is happening.

Earlier, the United Nations admitted that Canada had actually become a key region for the distribution and production of ecstasy and other synthetic drugs last month.

Interestingly, the market shares of heroin and cocaine are trending downward. This is because tablets are becoming more and more capable of reproducing the highest values.

This is now a game changer as it shifts production from developing countries to western countries.

When that happens, it tends to overwhelm the police capacity of Western countries.

It is my opinion that it is time for a very serious rethink of the drug policy that I have had for 40 years.

Well, recession.

Well, organized crime has already adapted well to the recession.

Not surprisingly, it is the most opportunistic industry in the entire world.

And there are no rules in that regulatory system.

Except, of course, the two business risks are arrest by law enforcement (which, frankly, is the least of their worries) and competition from other groups (that is, getting a bullet in the back of the head).

What they did was change their business.

During the recession, people took less drugs and visited prostitutes less frequently.

Instead, they entered financial and corporate crime in a big way, but most of all in two areas: counterfeiting and cybercrime.

And it was a huge success.

I would like to introduce you to Mr. Pringle.

Or, more accurately, I should say Senor Pringle.

I was introduced to this kit by a Brazilian cybercriminal.

We were sitting together in a car on Avenida Paulista in São Paulo.

I plugged it into my laptop and within about five minutes he had compromised the computer security system of a major Brazilian bank.

It's actually not that difficult.

And what's interesting about cybercrime is that it's more crime than technology.

The key to cybercrime is so-called social engineering.

To use the jargon, one person is born every minute.

You won't believe how easy it is to persuade people to do things with computers that are objectively not in their best interest.

And I realized that the quickest way for cybercriminals to do this is, of course, by promising sex and love.

I'm sure some of you remember the ILOVEYOU virus. The ILOVEYOU virus is one of the very great viruses to emerge worldwide.

I was very lucky when the ILOVEYOU virus came out. Because it was my ex-girlfriend who got the virus first.

Well she had all sorts of feelings and emotions towards me at the time but there was no love in it.

(Laughter) So as soon as I saw this drop into my inbox, I hurriedly trashed it to avoid a very nasty infection.

So, beware of cybercrime.

One thing we do know is that the Internet helps these people.

These are mosquitoes that carry the malaria parasite and infect our blood when we eat free meals at our expense.

Artesunate is now a highly effective drug for destroying parasites early in an infection.

But over the past year or so, Cambodian researchers have found that the malaria parasite is developing resistance.

And they fear that resistance to the drug may be due to Cambodians buying it online because they can't afford it in the commercial market.

And these tablets contain only a low dose of the active ingredient.

This is why parasites are becoming resistant.

I say this because you need to know that organized crime affects every area of ​​our lives.

You don't have to sleep with a prostitute or take drugs to be associated with organized crime.

They affect our bank accounts.

They affect our communications and pension funds.

They also affect the food we eat and our governments.

This is no longer a problem for Sicilians from Palermo or New York.

Romance doesn't exist in gangsters in the 21st century.

This is a powerful industry, causing instability and violence wherever it goes.

It's a big economic force and we need to take it very seriously.

It was an honor to speak with you.

thank you very much.

(applause)

A mountain that separates two lakes.

A room covered in bridal satin paper from floor to ceiling.

The lid of a giant snuffbox.

These seemingly unrelated images take us on a tour of the sperm whale head from Herman Melville's Moby Dick.

On the surface, the book tells the story of Captain Ahab's revenge hunt against a Moby Dick, whose leg has been bitten off.

However, while pirates, typhoons, high-speed chases, and giant squids appear in this book, don't expect your traditional ocean adventure.

Instead, it is a multi-layered one that explores not only the intimate details of life on a whaling ship, but themes of human and natural history as a whole, alternating between hilarious and tragic, humorous and urgent.

The narrator who guides us through these expeditions is a common sailor called Ishmael.

Ishmael begins to tell his story as he prepares to escape the "soul-damp drizzling November" by setting out to sea.

However, after befriending the Pacific Islander Queequeg and joining Ahab's crew on the Pequod, Ishmael becomes more of an all-knowing guide to the reader than a conventional character.

While Ahab is obsessed with revenge and First Mate Starbuck tries to persuade Ahab, Ishmael takes us on a quest for meaning across "the whole universe except its outskirts." He said that the biggest questions in life, even the smallest ones, pose as big problems.

Like the narrator, Melville is a restless and curious character who received an unconventional education as a young sailor participating in a series of grueling voyages around the world.

He published Moby Dick in 1851, at the height of the American whaling industry.

Nantucket, from which the Pequod sails, was the center of this lucrative and bloody global industry that depleted the world's whale population.

Unusually for the time, Melville did not shy away from the ugly side of the industry, even taking the perspective of a whale at one point in deducing how terrifying the ship's gigantic shadow must be to the creatures swimming below.

The author's direct familiarity with whaling is evident again and again in Ishmael's vivid account.

In one chapter, the skin of a whale's penis becomes protective clothing for the crew.

Chapters with disappointing titles like "The Tank and the Bucket" become some of the most rewarding chapters in the novel because they compare Ishmael's rescue of a sperm whale's head to midwifery and lead to reflections on Plato.

The entwining line of whales invites witty reflections on the ever-present dangers that involve all mortals.

He draws on knowledge from different fields such as zoology, gastronomy, law, economics, mythology and the teachings of various religious and cultural traditions.

The book experiments with style as well as subject matter.

In one monologue, Ahab challenges Moby Dick in Shakespearean style. I will fight you to the end. I will stab you out of the heart of hell. Out of hatred, I gave you my last breath. One chapter is written as a play script, in which the multiethnic crew of the Pequod participate individually and in chorus.

African and Spanish sailors taunt each other, Tahitian sailors miss their homeland, Chinese and Portuguese sailors want to dance, and a boy predicts disaster.

In another chapter, as ships rock in the midnight sea and barrels roar like landslides, Ishmael sings in epic style the process of decanting whale oil.

With such a wide range of content, there is something for everyone.

Readers will discover religious and political allegory, existential exploration, social satire, economic analysis, and representations of American imperialism, industrial relations, and racial conflict.

Like Ishmael in his quest for meaning and Ahab in pursuit of a white whale, this book explores the opposing forces of optimism and uncertainty, curiosity and fear that characterize human existence, whatever we seek.

Through the many pages of Moby Dick, Melville invites readers to plunge into the unknown and participate in a quest for "the elusive specter of life."

All too often public discussion of architecture is simply a reflection on the final result, the building.

Is London's newest tower a gherkin, a sausage, or a sex toy?

So recently we asked ourselves if we could invent a format that could really tell the story behind a project, could we combine images, drawings and words to really tell a story about architecture.

And it turns out that there was no need to invent it, it already existed in comic book form.

So we basically copied the format of the comics to really tell the behind-the-scenes story and how the project would actually evolve through adaptation and improvisation.

Through real world turmoil, opportunities and events.

We call this comic book "Yes is More," and it's clearly a sort of evolution of some of the hero's ideas.

In this case, "Less is More" by Mies van der Rohe.

He sparked the modernist revolution.

"Less is boring," said Robert Venturi after he emulated the postmodern counter-revolution.

After him, Philip Johnson introduced promiscuity, or at least tolerance for new ideas, with the words "I'm a whore" (laughs).

Recently, President Obama introduced optimism in times like the global financial crisis.

And what we're trying to say with Yes is More is, basically, we're trying to question this idea that architectural avant-garde is almost always negatively defined, as if it's against who or what.

The cliché of a radical architect is like an angry young man rebelling against the establishment.

Or the idea of ​​a misunderstood genius who is frustrated that the world doesn't fit his ideas.

We are much more interested in evolution than in revolution, the idea that things evolve gradually by adapting and improvising to changes in the world.

In fact, I think Darwin is one of the people who best describes our design process.

His famous evolutionary tree is a rough sketch of how we work.

As you can see, the project evolves through generations of design meetings.

Too many ideas at every meeting.

Only the best can survive.

And through the architectural selection process, you may choose a model that is really beautiful, or a model that is very functional.

we breed them. They have some kind of mutant offspring.

And after many generations of design meetings like this, the design is complete.

A project I did for a library and hotel in Copenhagen is a literal expression of that.

The design process was really rigorous, almost like a struggle for survival, but gradually the ideas evolved. The idea of ​​a rational tower that integrates with the surrounding city is like extending the public space to what is called the Scandinavian version of the Spanish Steps in Rome, but public not only on the inside, such as the library, but also on the outside.

But Darwin doesn't just describe the evolution of a single idea.

As you can see, subspecies can diverge.

And so often we go to design meetings and discover that we have this great idea.

It doesn't really work in this context.

But for another client in another culture, it might actually be the correct answer to another question.

As a result, we never throw anything away.

Our office is like an architectural biodiversity archive.

I don't know when I will need it.

And what I want to do now, as an act of warp-speed storytelling, is tell how the two projects evolved in improvisation, adapting to world events.

The first story begins when I went to Shanghai last year to do the competition for the Danish National Pavilion at the 2010 World Expo.

And then we saw this guy, Hai Bao.

He is the mascot of the Expo, and I feel strangely familiar with him.

In fact, he resembled the building we designed for a hotel in northern Sweden.

When I entered the Swedish competition, I thought it was a great plan, but it didn't look like anything from northern Sweden.

Nor did the Swedish jury think so. So we lost.

However, after that, I had a meeting with a Chinese businessman, and when he saw our design, he said, "Wow, this is the Chinese character for 'people'."

I also double checked.

And at the same time, we were invited to exhibit at Shanghai Creative Industry Week.

So we thought this was too much of an opportunity and decided to hire a feng shui master.

We scaled the building up to three times the size of China and went to China.

(Laughter.) So that's what we used to call the "People's Building."

This is our interpreter for the two of us, kind of reading architecture.

The work was featured on the cover of the Wen Wei Po newspaper, and the mayor of Shanghai, Chen Liangyu, also visited the exhibition.

And then I had the opportunity to explain the project.

And when he said, "Shanghai is the city with the most skyscrapers in the world," it was as if the root connection had been severed.

And for People's Pavilion, he saw architecture that could bridge the gap between China's ancient wisdom and China's progressive future.

So we clearly agreed deeply with his opinion.

(Laughter) (Applause) Unfortunately, Mr. Chen is currently in prison for corruption.

(Laughter) But, as I said earlier, Kaiho is actually a Chinese character for "people", so it looked very familiar.

And they chose this mascot because the Expo's theme is "Better City, Better Life."

sustainability.

And we wondered if sustainability had grown into this kind of neo-Protestant thinking that you have to hurt to do good.

Do not take long hot showers.

It's bad for the environment, so don't fly on holidays.

Gradually we get the idea that sustainable living is less enjoyable than normal life.

So we thought it might be interesting to focus on examples of how sustainable cities actually improve quality of life.

We also asked ourselves what Denmark could show relevant to China.

As you know, this country is one of the largest and also one of the smallest countries in the world.

China symbolized by the dragon.

Denmark has a swan, the national bird.

(Laughter) There are many great poets in China, but it turns out that the public school curriculum in the People's Republic has three fairy tales by An Tu Sheng, or what we call Hans Christian Anderson.

In other words, all 1.3 billion Chinese have grown up watching The Emperor's New Clothes, Matchstick Girl, and The Little Mermaid.

It's like a piece of Danish culture integrated into Chinese culture.

The biggest tourist attraction in China is the Great Wall of China.

The Great Wall of China is the only thing visible from the moon.

Denmark's biggest tourist attraction is the Little Mermaid.

In fact, it is rarely seen on canal tours.

(Laughter) And that seems to point to the difference between these two cities.

Copenhagen, Shanghai, Modern, Europe.

However, looking at recent urban development, I realized that this resembles Shanghai's cityscape 30 years ago. All bicycles, no cars.

This is how I feel today. All traffic jams.

Bicycles have been banned in many places.

Meanwhile, Copenhagen is actually expanding its bike lanes.

A third of the population commute to work by bicycle.

There is a bicycle system called city bike that you can borrow for free when you visit the city.

So we thought, why not reintroduce the bicycle to China.

Donate 1,000 bicycles to Shanghai.

So when you come to the Expo, go straight to the Denmark pavilion, get a Danish bicycle, then visit the other pavilions.

As I said earlier, both Shanghai and Copenhagen are port cities, but the water in Copenhagen is so clean that you can swim in it.

One of the first projects we did was the Harbor Baths in Copenhagen, like continuing a public area into the water.

So, we suspected that these expositions often featured state-funded propaganda, images, and statements, but not actual experiences.

So we won't talk about it, just like with bicycles.

you can try it.

As with water, I'm not going to talk about it, I'm going to sail 1 million liters of harbor water from Copenhagen to Shanghai. Then the brave Chinese can actually dive in and feel how clean the water is.

This is where people usually object that sailing water from Copenhagen to China is not very sustainable.

In reality, however, container ships go from China to Denmark, fully loaded with goods, and then return empty.

Therefore, water is often loaded for ballast.

So you can actually ride for free.

And in the middle of a harbor bath like this, I'm going to actually put a real Little Mermaid.

So real mermaids, real water, and real bikes.

And when she is gone, we plan to invite a Chinese artist to reinterpret her.

The architecture of the pavilion is such an exhibition and a bicycle loop.

If you go to the exhibition, you will see a mermaid and a pool.

Walk around and start looking for the bike on the roof, hop on it and continue on to the rest of the exposition.

So when I actually won the contest, I had to hold an exhibition in China to explain my project.

And to our surprise, one of our boards is back fixed from Chinese state censorship.

First, Taiwan was not on the map of China.

It is a very serious political issue in China. I will continue to add.

Second, when we compared the swan to a dragon, the Chinese government said, "Propose to change it to a panda."

(Laughter) (Applause) So when it became clear that they were actually going to move a national monument in Denmark, the National People's Party sort of rebelled against it.

They tried to enact a law banning the migration of mermaids.

So I was invited to speak at the National Assembly for the first time.

This was kind of interesting because in the morning from 9 to 11 they were talking about the bailout, the billions of dollars they would invest in saving the Danish economy.

And at eleven o'clock they stopped talking about these little problems.

And from 11:00 to 1:00 they were debating whether to send the mermaids to China.

(Laughter) (Applause) But the bottom line is, if you want to see The Little Mermaid from May to December next year, don't come to Copenhagen. Because she will be in Shanghai.

If you're in Copenhagen, you'll probably see an installation by Chinese artist Ai Weiwei.

But if the Chinese government intervenes, it could turn into a panda.

(Laughter) So the second story I want to tell actually starts at my house.

This is my apartment.

This is the view from my apartment above the triangular balcony-like landscape that the client called Leonardo DiCaprio's Balcony.

And they form a vertical backyard like this, which on a nice summer day is practically introduced to all neighbors within a vertical radius of 10 meters.

The house is like a distorted square block.

I'm trying to place all the apartments in a zigzag to make it look straight instead of facing each other.

Until recently, this was the view from my apartment of this location where our client actually purchased the lot next door.

And he said he was going to build an apartment complex next to the parking lot.

So instead of having a traditional stack of apartments looking straight out onto a boring big block of cars, we thought, why not turn all the apartments into penthouses and put them on a car podium.

Copenhagen is completely flat, so if you want to build a south-facing slope with a view, you basically have to do it yourself.

Then I reduced the volume a little so as not to block the view from the apartment.

(Laughter) And basically the parking lot is like taking up a deep space under the apartment.

And in the sun you get single-story apartments that combine all the splendor of suburban lifestyle. For example, a garden house with an urban view and some sort of dense urban location.

This is our first architectural model.

This is an aerial photograph taken last summer.

And basically, the apartment covers the parking lot.

Access from this diagonal elevator.

This is actually a stand-up product from Switzerland, as oblique elevators are a matter of course in Switzerland.

(Laughter) And the parking lot façade, we wanted the parking lot to be naturally ventilated, so we had to cut holes in it.

And I discovered that by controlling the size of the holes, I could actually turn the entire façade into a naturally ventilated, rasterized gigantic image.

And since we always call this project 'The Mountain', we asked this Japanese Himalayan photographer to provide us with some beautiful images of Mt. Everest, making the entire building a 3,000 square meter artwork.

(Applause) So, back in the parking lot or hallway, the cars and the colors make me feel like I'm traveling to a parallel world, a south-facing urban oasis.

The wood in your apartment continues outside and becomes a facade.

If you go further, you will come to this lush garden.

And all the rainwater that falls on the mountains actually accumulates.

And with an automatic irrigation system, this kind of garden landscape turns into something like a completely green Cambodian temple ruins after a year or two.

So this mountain is sort of the first building example of what we call the alchemy of architecture.

The idea, if not gold, can at least really create added value by combining traditional elements such as a regular apartment with a regular parking lot, and in this case it actually gives people the opportunity to not have to choose between living with a garden or living in the city.

You can actually have both.

As an architect, setting an agenda is really hard.

Now, we cannot say, “I want to create a sustainable city in Central Asia.” Because it's not really a way to get a commission.

We always have to adapt and improvise in some way to opportunities, accidents, and turmoil in the world.

As a final example, like last summer, we recently won a design competition for the Nordic National Banks.

The director of the bank when he was still smiling.

(laughs) I was really excited about this opportunity because it was right in the middle of the capital.

Unfortunately, it was the National Bank of Iceland.

At the same time, we actually had visitors. A minister from Azerbaijan came to our office.

We took him to see the mountains. And since Azerbaijan is known as the Alps of Central Asia, the idea of ​​being able to actually create mountains out of architecture got him very excited.

So he asked us if we could really imagine an urban master plan on an island outside the capital that would recreate the silhouettes of Azerbaijan's seven most important mountains.

So we received our commission.

And we made this little movie and we want to show it.

We often make small movies.

We always discuss soundtracks a lot, but this time it was really easy to pick the songs.

So basically Baku is a crescent-shaped bay overlooking our planned island of Zira, just like the picture on their flag.

And our main idea was to sample the 7 most important mountains of Azerbaijan's topography and reinterpret them into urban and architectural structures suitable for human life.

Then place these mountains on an island and surround this kind of central green valley, just like a central park.

And what's interesting is that this island is now just a piece of desert. No plants.

No water. No energy, no resources.

So we actually designed the entire island as a single ecosystem, using wind energy to power a desalination plant and using the thermal properties of water to heat and cool the buildings.

And all kinds of excess freshwater wastewater is organically filtered and incorporated into the landscape, gradually transforming the deserted island into something like a lush landscape.

In other words, while urban development usually comes at the expense of nature, in this case we are actually creating nature.

And the building not only evokes images of mountains, it functions like them.

They create a shelter from the wind.

They store solar energy.

they accumulate water.

So it actually turns the entire island into a single ecosystem.

So we recently submitted a master plan and it was approved.

And this summer we are starting the construction documents for the first two mountains, which will be Central Asia's first carbon-neutral island.

(Applause.) Yes, maybe just for closing.

So, in a way, you can see how the mountains of Copenhagen evolved into the Seven Peaks of Azerbaijan.

With a little luck and further evolution, maybe in 10 years it could be the five mountains of Mars.

thank you.

(applause)

New viruses emerge and spread like wildfire.

To contain the infection, researchers must first collect data on who has been infected.

Two major virus inspection technologies are important. One shows if you have the virus and the other shows if you already have the virus.

So how exactly do these tests work?

PCR (Polymerase Chain Reaction Test) targets the genetic material of the virus in the body and is used to diagnose currently infected people.

However, this genetic material can be present in imperceptible amounts, making it difficult to actually detect it.

This is where PCR comes into play. PCR is widely used to amplify genetic information in large enough quantities to easily observe it.

To develop a PCR test for a never-before-seen virus, researchers first sequence its genetic material, or genome, to identify regions that are unique to that particular virus.

PCR then targets these specific segments.

PCR testing begins with sample collection. Samples are blood for hepatitis virus, faeces for poliovirus, and nose or throat samples for coronavirus.

Samples are taken to a central laboratory where PCR is performed and tested for the presence of the viral genome.

Genetic information can be encoded via DNA or RNA.

For example, HPV uses DNA, while SARS-CoV-2, the cause of COVID-19, uses RNA.

Prior to performing PCR, viral RNA (if present) must be reverse transcribed to create complementary DNA strands.

Researchers then perform PCR.

If the virus is present in the sample, its unique gene coding region is identified by complementary primers and enzymatically copied.

A single strand of DNA has hundreds of millions of strands and is detected using probes marked with fluorescent dyes.

If the PCR machine detects fluorescence, the sample tests positive for the virus, meaning the individual is infected.

Immunoassays, on the other hand, take advantage of the immune system's memory of viruses and show whether someone has been infected before.

They work by targeting virus-specific antibodies produced by the immune system during infection.

These are a specialized class of proteins that identify and fight foreign substances such as viruses.

Immunoassays can detect the most abundant class of IgG antibodies and the first type of IgM antibodies produced in response to a new infection.

The presence of IgM antibodies suggests recent infection, but is unreliable in diagnosing current infection as it may take a week or more for detectable amounts to be produced in the body.

IgG antibodies, on the other hand, circulate for a long time after infection. Their presence usually indicates that someone has been exposed and recovered.

Before an immunological test, a medical professional will take blood from the individual.

This sample is then contacted with a portion of the virus of interest.

If your body has indeed been exposed to the virus in the past, your body's virus-specific antibodies will bind to the virus during the test.

This reaction causes a color change, indicating that the sample has tested positive and that the individual has been exposed to the virus.

Immunoassays are particularly important when retrospectively diagnosing infected people who were not tested.

And it has great potential for those who have acquired immunity to the virus. In some cases, the plasma could be used as a treatment for people currently battling the virus.

PCR and immunoassays are always in the process of becoming more accurate and efficient.

For example, innovations in PCR have enabled the use of self-contained testers that deliver results within an hour.

Digital PCR, which quantifies individual fragments of target DNA, promises even greater accuracy.

And although developing immunoassays quickly is difficult, researchers in Singapore were able to create an immunoassay for SARS-CoV-2 even before COVID-19 was declared a pandemic.

These tests are absolutely essential, along with the scientists who develop them and the medical professionals who perform them.

And early deployment could save millions of lives.

So the question is, what is the invisible?

In fact, there are more of them than you might think.

All, I would say. All important things except all things and important things.

We can see matter. But I'm not sure what the problem is.

As in this cryptic passage I recently found in The Guardian: "The marriage fell apart when the husband was murdered by his wife in 1965."

(laughs) Isn't there an invisible world there?

(Laughter.) I mean, we can see the stars and the planets, but we can't see what separates them or what pulls them together.

When it comes to matter, like humans, we see only the surface of things.

You can't see inside the engine room.

What excites people, at least not without difficulties.

And the more you look at something, the more it disappears.

In fact, if you look closely at an object, if you look at the basic substructure of matter, there is nothing there.

The electrons kind of fizzle out, leaving only the energy. And energy is invisible.

In other words, everything that is important, important, is invisible.

Invisible and a little ridiculous is this story. You can't see this.

And now I try to make it visible in your mind.

My name is Jeffrey Dickens, a Member of Parliament.

The late Congressman Jeffrey Dickens was at a party in his constituency.

Everywhere he went, at every stall he stopped at, a devoted smiling woman of indescribable ugliness followed him all the way.

(Laughter) No matter how hard he tried, he couldn't get away from her.

A few days later, he received a letter from a voter stating how much she admired him, had met him at a festival, and asked for an autographed photo.

Her name was followed in brackets by the appropriate expression horse face.

(Laughter.) "I misread these women," thought Mr. Dickens.

"She's not only aware of her physical resentment, she's using it to her advantage.

A photo is not enough. ”

So he went to buy a plastic frame to put the picture in.

On the photo, he wrote, "To Horseface, with love from Congressman Jeffrey Dickens."

After sending the letter, his secretary said to him, "Did you receive the letter from the lady of the festival?"

I wrote her Horseface, so remember who she is. ”

(Laughter) I guess he wished he couldn't see?

(Laughter) So one of the interesting things about invisibility is that you can't understand what you can't see.

Gravity is one of those things that we cannot see or understand.

This is the least understood and weakest of the four fundamental forces.

And no one knows what it is or why it's there.

Not surprisingly, Sir Isaac Newton, the greatest scientist of all time, believed that Jesus came to Earth specifically to manipulate the levers of gravity.

That's why he thought he was there.

So, smart man, it could be wrong, I don't know.

(laughs) Consciousness. I can see everyone's faces.

I don't know what you guys are thinking. Isn't that amazing?

Isn't it amazing that we can't read each other's minds?

But if you can get close enough, you can probably touch each other and get a taste of each other.

But we cannot read each other's minds. I think that's pretty amazing.

In this great Middle Eastern religion, the Sufi faith, which some claim to be the root of all religions, all Sufi masters are telepaths, they say.

However, their primary use of telepathy is to send a strong signal to the rest of us that telepathy does not exist.

That's why we think that the Sufi masters are working with us that it doesn't exist.

In the matter of consciousness and artificial intelligence, as in the study of consciousness, artificial intelligence has not progressed at all. We don't know how consciousness works.

As for artificial intelligence, not only have we not created artificial intelligence, we have not yet created artificial stupidity.

(laughter) The laws of physics: invisible, eternal, omnipresent, and omnipotent.

do you remember someone?

interesting. As you can imagine, I'm not a materialist, I'm a non-materialist.

And I found a very useful new word "ignostic". have understood?

I am an agnostic.

I refuse to get involved in the question of whether God exists until someone properly defines the term.

(Laughter) Another thing that we can't see is the human genome.

About 20 years ago, when they started digging into the genome, they thought it probably contained about 100,000 genes, which makes this all the more strange.

As any geneticist knows, it has been revised downward every year since.

There are currently thought to be just over 20,000 genes in the human genome.

This is unusual. Because rice is known to have 38,000 genes.

Potatoes, potatoes have 48 chromosomes. Do you know?

Two more than humans and about the same as gorillas.

(Laughter) These things are invisible, but they are very strange.

(laughter) Stars during the day. I always find it fascinating.

the universe disappears.

The more light, the less visible.

Time, no one can see the time.

I don't know if you know this. There is a big move in modern physics to decide that time doesn't really exist because it's too inconvenient for numbers.

It's much easier if it doesn't actually exist.

Of course, we cannot see the future.

And you cannot see the past except in memory.

One interesting thing about the past is that it is especially invisible. My son asked me the other day. "Dad, do you remember when I was two years old?"

And I said yes. And he said, "Why can't I?"

Isn't that unusual? I can't remember what happened to me before I was 2 or 3 years old. This is good news for psychoanalysts. Because if you don't, you'll lose your job.

Because that's where all the things that make you happen (laughs).

Another invisible thing is the grid we hang from.

This is charming. You probably know that cells are continuously renewed. It can be found on the skin.

The skin is peeling off, the hair is growing, the nails are growing, that kind of thing.

However, all cells in the body are replaced at some point.

Taste buds, about every 10 days.

Liver and internal organs take a little longer. The spine takes years.

But when seven years pass, none of the cells in your body will remain from seven years ago.

The question, then, is who are we?

what are we What are we hanging, what is it actually?

have understood. Atoms are invisible.

No one does. It is smaller than the wavelength of light.

Gus, you can't see it.

interesting. Someone mentioned 1600 recently.

Gas was invented by Dutch chemist Van Helmond in 1600.

It is said to be the most successful word invention ever by a known person.

Pretty good. He also invented a word called "brass" which means astral radiation.

Unfortunately it didn't.

(Laughter) But good job, he.

(Laughter) There are many things -- light.

I can't see the light. In the darkness of a vacuum, you can't see it when someone shines a beam straight into your eye. It's a bit technical, but some physicists will disagree.

But it's strange that you can't see the ray, only what it hits.

I think it's abnormal that you can't see the light, you can't see the darkness.

Electricity, you can't see it.

Don't let anyone tell you they understand electricity.

it's not. No one knows what it is.

(Laughter) You would think that when you turn on the light, the electrons in the wire move instantaneously down the wire at the speed of light. it's not.

Electrons jump down a wire at the same speed as honey spreads.

(Laughter) There are an estimated 100 billion galaxies in the universe.

100 billion. How many can you see? Five.

Five of the 100 billion galaxies are visible to the naked eye, and one of them is very difficult to see unless you have very good eyesight.

radio waves. There is one more thing.

When Heinrich Hertz discovered radio waves in 1887, he called them radio waves because they radiate.

And someone said to him, "So what does this mean, Heinrich?"

What is the meaning of this radio wave you found? ”

And he said, "Well, I don't know.

But someday someone will find a use for them. ”

That's what they do, radio. That's what they discovered.

Anyway, the biggest thing we can't see is what we don't know.

It's incredible how little we know.

Thomas Edison once said, "We don't know a millionth of a percent about anything."

And I've come to the conclusion - because you asked this other question, "What's the other thing you don't see?"

Most of us matter. what's the point?

(Laughter) (Applause) You don't see the point. Curiously, like the electron, it is dimensionless by definition.

But my conclusion is that there are only two questions that are really worth asking.

"Why are we here?" and "What should we do now?"

And to help you, I would like to leave you two things from two great philosophers, perhaps two of the greatest philosophical thinkers of the twentieth century, one a mathematician and engineer and the other a poet.

The first was Ludwig Wittgenstein, who said, "I don't understand why we are here.

But I'm sure it's not for our own enjoyment. ”

(Laughter) He was a jolly guy, wasn't he?

(Laughter.) And second and last, W.H. Auden, one of my favorite poets, said, "We are in this world to help others.

I don't know what other people are here for. ”

(laughter) (applause)

In the 16th century, the Flemish physician Andreas Vesalius explained how a suffocated animal could be kept alive by inserting a tube into its windpipe and blowing air into it to inflate its lungs.

In 1555, the procedure was not very admired.

Today, however, Vesalius' paper is recognized as the first description of mechanical ventilation, an important practice in modern medicine.

To understand the value of ventilation, we need to understand how the respiratory system works.

We breathe by contracting the diaphragm, expanding the chest cavity.

This draws in air and expands the alveoli, the millions of tiny air sacs inside the lungs.

Each of these tiny balloons is surrounded by a mesh of blood-filled capillaries.

This blood absorbs oxygen from the expanded alveoli and leaves carbon dioxide.

When the diaphragm relaxes, CO2 is exhaled along with a mixture of oxygen and other gases.

This process is automatic if our respiratory system is working properly.

However, the respiratory system can be disrupted by various circumstances.

In sleep apnea, the muscles of the diaphragm stop contracting.

Asthma can cause airway inflammation that blocks oxygen.

Pneumonia is also often caused by bacterial or viral infections, which attack the alveoli themselves.

Invading pathogens destroy lung cells and trigger an immune response that causes fatal inflammation and fluid buildup.

All these situations prevent the lungs from functioning properly.

But the ventilator takes over the process, getting oxygen into the body when the respiratory system can't.

These machines bypass narrowed airways and pump oxygen-rich air, allowing damaged lungs to diffuse more oxygen.

There are two main methods of ventilator operation. Air is forced into the patient's lungs through positive pressure ventilation, and air is passively drawn in through negative pressure ventilation.

Ventilation technology in the late 19th century focused primarily on negative pressure. Negative pressure is very similar to natural breathing, distributing air evenly in the lungs.

To accomplish this, doctors created a tight seal around the patient's body by confining him in a wooden box or specially sealed room.

Air was then pumped out of the chamber, reducing the air pressure and allowing the patient's chest cavity to expand more easily.

In 1928, doctors developed a portable metal device with a pump driven by an electric motor.

Known as the Iron Lung, this machine remained in hospitals until the mid-20th century.

However, even the most compact negative pressure designs severely restricted patient movement and hindered caregiver access.

This led hospitals in the 1960s to move to positive pressure ventilation.

In mild cases, this can be done non-invasively.

Face masks are often worn over the mouth and nose and filled with pressurized air that enters the patient's airways.

But in more demanding situations, you'll need a device that takes over the entire breathing process.

A tube is inserted into the patient's windpipe to pump air directly into the lungs. A series of valves and branch pipes form an inspiratory and expiratory circuit.

Most modern ventilators have an embedded computer system that monitors the patient's breathing and can adjust airflow.

These machines are used as a last resort, not as standard therapy.

Strong sedation is required to withstand this influx of pressurized air, and repeated ventilations can cause long-term lung injury.

But in extreme situations, a ventilator can mean the difference between life and death.

And events like the COVID-19 pandemic are showing them to be even more important than we thought.

Current models are bulky, expensive, and require extensive training to operate, so most hospitals only have a few in stock.

Under normal circumstances this may be sufficient, but in an emergency this limited cache will be narrow.

The world urgently needs more low-cost, portable ventilators and a faster means of manufacturing and distributing this life-saving technology.

Unfortunately, consider this common scenario.

A few months ago, a highly contagious and sometimes fatal respiratory virus infected humans for the first time.

Since then, the infection has spread faster than it can be controlled by public health measures.

The World Health Organization (WHO) has now declared a pandemic. This means that the pandemic is spreading all over the world.

The death toll is starting to rise and everyone is asking the same question: when will the pandemic end?

The WHO is likely to declare the end of the pandemic once the infection has been largely contained and infection rates have fallen significantly around the world.

But when that happens will depend on what governments around the world choose next.

They have three main options. Race it, vaccinate it late, or smash it with coordinating.

One is widely considered the best and may not be what you think.

The first is that governments and communities do nothing to stop the spread and instead allow people to get infected as quickly as possible.

With no time to study the virus, doctors know little about how to save patients, and hospitals quickly reach peak capacity.

Millions to hundreds of millions have died from the virus and the collapse of the healthcare system.

Soon, the vast majority of people will be infected and either die or survive by building up an immune response.

At this point herd immunity kicks in and the virus is unable to find new hosts.

As such, the pandemic will subside soon after it starts.

But there are other ways to establish herd immunity without such a high life cost.

Let's reset the clock the moment WHO declares a pandemic.

This time, governments and communities around the world are trying to slow the spread of the virus and give laboratories time to manufacture a vaccine.

They are buying up this critical time through tactics such as extensive testing to identify carriers, isolating infected people and those who have come into contact with them, and physical distancing.

Even with these measures, the virus spreads slowly and kills up to hundreds of thousands of people.

Some cities had the epidemic under control and returned to business as usual, but as new cases passed, the infection spread again and physical distancing reverted.

Thanks to global efforts, within the next few years one or possibly several vaccines will be made widely available, hopefully free of charge.

Once 40-90% of the population is infected (the exact amount depends on the virus), herd immunity kicks in and the pandemic subsides.

Let's turn the clock back again and consider one final strategy: Tune and Shatter.

The idea here is to combine quarantine, social distancing and travel restrictions to simultaneously starve the virus everywhere.

A key factor is synchronizing responses.

In a typical pandemic, one country may be peaking when the first cases occur in another.

Instead of every leader reacting to what is happening within their own jurisdiction, here everyone must treat the world as a huge interconnected system.

If properly coordinated, the pandemic could be ended in just a few months with fewer lives lost.

However, unless the virus is completely eradicated (which is highly unlikely), there is a risk that it will spread to pandemic levels again.

And factors such as animals that carry and transmit viruses can completely undermine our best efforts.

So which strategy is best against this deadly infectious respiratory virus?

Rush to get over it is a quick fix, but it could be completely ineffective if it becomes a global catastrophe and people can get re-infected.

Eliminating the virus through cooperation alone is attractive because of its speed, but it can only be trusted with true and near-impossible global cooperation.

As such, vaccination with global cooperation wherever possible is generally considered the winner. This is a slow, steady and proven option in racing.

Even if the pandemic is officially over before a vaccine is ready, vaccines will still protect people, as the virus can reappear seasonally.

And while it may take years to produce, the disruption to most people's lives doesn't necessarily last that long.

Breakthroughs in treatment and prevention of symptoms will make the virus so much less dangerous that it will require less extreme containment measures.

rest assured. The pandemic will definitely end.

Its legacy will be long-lasting, but it's not all bad. The breakthroughs, social services and systems we develop can be used to make everyone better.

And if we draw inspiration from our successes and learn lessons from our failures, we can contain the next potential pandemic to the point that our children don't even know its name.

We see with our eyes, but we also see with our brains.

And seeing with the brain is often called imagination.

And we are familiar with our own imaginary landscape, our landscape.

But there are also hallucinations.

And hallucinations are completely different.

It doesn't look like it was made by us.

They seem out of control.

They seem to come from the outside and mimic perception.

So I would like to talk about hallucinations and certain types of hallucinations that I see among my patients.

A few months ago I got a call from the nursing home where I work.

They told me that one of the residents, an old lady in her 90s, looked at her and wondered if she had gone mad, or because she was an old lady, had a stroke or had Alzheimer's disease.

So they asked me if I wanted to come see the old lady Rosalie.

i went to see her

It was immediately apparent that she was perfectly sane, lucid and of great intelligence, but she was so surprised and so bewildered as she saw things.

And she told me that the nurses hadn't mentioned this, but she was blind and had been completely blind for five years with macular degeneration.

But now, in the last few days, she's been seeing things.

So I said, "What do you mean?"

And she said, "People in oriental costumes, curtains, going up and down stairs.

The man looks at me and smiles, but he has big teeth on one side of his mouth.

animals too.

I saw a white building. It's snowing, soft snow.

You can see this horse harnessed and dragging snow.

Then one night, the scene changes.

I see cats and dogs walking towards me.

They reach a point and stop.

Then it changes again.

I see many children. they are going up and down the stairs.

They wear bright colors such as roses and blues, like oriental dresses. ”

Sometimes, she said, she has hallucinations of pink and blue squares on the floor that seem to extend to the ceiling before people appear.

I said, "Is this like a dream?"

And she said, "No, it's not like a dream. It's like a movie."

She said, "There's color, there's movement.

But it's completely silent, like a silent movie. ”

And she said it's a pretty boring movie.

(Laughter.) She said, "All the people in oriental costumes were going back and forth, very repetitive, very limited."

(Laughter.) And she had a sense of humor.

She knew it was a hallucination, but she was scared.

She has lived to be 95 and has never experienced a hallucination before.

She said the hallucinations seemed to come and go spontaneously, regardless of what she was thinking, feeling or doing.

She had no control over them.

She said she didn't recognize any of the people or places in her hallucinations, nor did she remember any people or animals. Well, not everyone seemed to notice her.

And she didn't know what was going on.

I thought she had gone mad, or had lost her mind.

Well, I examined her carefully.

She was a bright old lady, perfectly sane.

She was not taking any drugs that could cause hallucinations.

But she was blind.

And I said to her, "I think you know what you have."

“There are special forms of visual hallucinations that can lead to reduced vision and even blindness.

This was originally described in the 18th century by a man named Charles Bonnet," I said.

And you have Charles Bonnet Syndrome.

There is nothing wrong with your brain. There is nothing wrong with your heart.

And she was very relieved and also quite curious that there was nothing serious about this.

She said, "Who is this Charles Bonnet?"

She said, "He had it himself?"

And she said, "Tell all the nurses that I have Charles Bonnet Syndrome."

(Laughter) "I'm not crazy. I don't have dementia. I have Charles Bonnet Syndrome."

Yes, I told the nurse.

For me, this is a common situation.

I work primarily in a nursing home.

I see a lot of elderly people who are deaf or visually impaired.

About 10 percent of deaf people experience auditory hallucinations.

And about 10 percent of blind people experience visual hallucinations.

You don't have to be completely blind, just enough.

Well, in the original 18th century account, Charles Bonnet didn't have them.

His grandfather had such hallucinations.

His grandfather was an elderly man who was a judge.

He had cataract surgery.

His eyesight was pretty bad.

And in 1759 he described to his grandson the various things he had seen.

The first thing he said was that he saw a handkerchief in the air.

It was a large blue handkerchief with four orange dots.

And he knew it was a hallucination.

There are no handkerchiefs in the air.

And he saw a big wheel in the air.

However, at times he was unsure if he was hallucinating, as the hallucinations fit the context of the vision.

So one day when his granddaughters came to visit them, he said, "By the way, who is this handsome young man with you?"

(Laughter.) And they said, "Oh, Grandpa, there are no handsome young men."

And then the beautiful young men disappeared.

It is typical of this hallucination to appear in an instant and then disappear.

No fade-in or fade-out usually occurs.

It's pretty sudden and suddenly changes.

My grandfather Charles Lurin saw hundreds of different people, all kinds of different landscapes.

Once he saw a man in a bathrobe smoking a pipe and realized it was himself.

It was the only person he recognized.

Once, as he was walking down the streets of Paris, he saw scaffolding. This was real.

But when I got home, I saw a six-inch-tall scaffolding miniature sitting on my study desk.

This repetition of perception is sometimes called "palinopsia".

What seemed to be happening to him and Rosalie - and Rosalie said, "What's going on?"

And then things start to appear.

What you see can actually be very complicated.

Another patient of mine also had some vision, but the vision she saw could cause anxiety.

One day, she saw a man in a striped shirt in a restaurant.

Then he turned and began walking towards her, splitting into six figures in striped shirts.

And the six figures gathered like a bellows.

One time when she was driving, or rather her husband was driving, the road split into four and she felt like she was climbing four roads at the same time.

She also had highly mobile hallucinations.

Many of them were car related.

Occasionally I saw a teenage boy sitting on the hood of a car.

He was very tenacious and moved quite gracefully when the car turned.

And when they stopped, the boy suddenly took off vertically about 100 feet into the air and then disappeared.

Another patient of mine had a different kind of hallucination.

The woman had no eye problems, but had a small tumor in the visual part of the brain, the occipital cortex.

And most of all, she watched cartoons.

And these cartoons are transparent and will cover half of your field of view like a screen.

And in particular, she watched Kermit the Frog cartoon.

(Laughter) I don't watch Sesame Street now, but she bothered to say, 'Why Kermit? She said, "Kermit the Frog means nothing to me."

You know, I was wondering about Freudian determinants. why kermit?

"Kermit the Frog means nothing to me."

She didn't really care about cartoons.

What haunted her, however, was that very persistent images and hallucinations of faces appeared in her, often deformed with very large teeth and very large eyes, as was the case with Rosalee.

And these frightened her.

Now what is going on with these people?

As a doctor, I have to clarify what is going on and reassure people, especially that they are not crazy.

As I said earlier, about 10% of blind people suffer from these diseases.

However, only 1% of people recognize them. Because they're afraid they'll think they're crazy or something.

And if they tell their doctor about it, they can be misdiagnosed.

In particular, there is the idea that seeing or hearing something drives you crazy.

But psychotic hallucinations are quite different.

Psychotic hallucinations speak to you, whether they are visual or audible.

They condemn you, seduce you, humiliate you, mock you.

you interact with them.

These Charles Bonnet hallucinations are utterly devoid of this quality.

I have a film. Are you watching a movie that has nothing to do with you, or what do people think of it?

A rare condition called temporal lobe epilepsy can make people feel like they've traveled back in time and place.

You are at a particular road intersection.

It smells like roasted chestnuts.

I hear cars. All senses are involved.

And you are waiting for your girl.

And that was a Tuesday night in 1982.

All temporal lobe hallucinations are sensory hallucinations: they are emotional, relatable, space-time located, coherent, and dramatic.

Charles Bonnet's is quite different.

Charles Bonnet's hallucinations come on all sorts of levels, from geometric hallucinations of pink and blue squares seen by a woman to highly elaborate hallucinations of figures, especially faces.

The most common of these hallucinations are faces, and sometimes deformed faces.

Comic books are the second most popular.

So what's going on?

Interestingly, in the last few years it has become possible to obtain functional brain images of people who are hallucinating, or to perform fMRIs, and indeed to discover that different parts of the visual brain are activated during hallucinations.

When people experience simple geometric hallucinations like this, the primary visual cortex is activated.

This is the part of the brain that recognizes edges and patterns.

The primary visual cortex does not form images.

The upper part of the visual cortex located in the temporal lobe is involved when images are formed.

One area in particular of the temporal lobe is called the fusiform gyrus.

And it is known that damage to the fusiform gyrus can lead to loss of the ability to recognize faces.

However, if there is abnormal activity in the fusiform gyrus, hallucinations may be seen. This is exactly what happens to some people.

At the front of this gyrus is the area where teeth and eyes are represented, and that part of the gyrus is activated when people experience deformed hallucinations.

There is another part of the brain that is particularly activated when watching cartoons.

Activated when recognizing cartoons, drawing cartoons, and seeing hallucinations.

It is very interesting that it is specific.

There are other parts of the brain that are specifically involved in recognizing buildings and landscapes and hallucinating.

Around 1970, it was discovered that certain cells existed in more than just parts of the brain.

"Facial cells" were discovered around 1970.

And now we know that there are hundreds of other types of cells, and they are very special.

So you may not only have an "auto" cell, but also an "Aston Martin" cell.

(laughs) I saw an Aston Martin this morning. had to bring.

(Laughter.) And now it's out there somewhere.

So -- (laughter) Now, at this level, what we call the inferior temporal cortex, there are only visual images, or imaginations, or fragments.

Only at a higher level are the other senses joined and the connection with memories and emotions.

And with Charles Bonnet Syndrome, you can't progress to those higher levels.

You are at these levels of the lower visual cortex. There are thousands, tens of thousands, millions of images, or fragments and fragments, all neurally encoded in specific cells or small clusters of cells.

Normally, these are all part of an integrated stream of perception or imagination, and one is unaware of them.

The process is interrupted only if you are blind or visually impaired.

And instead of gaining normal perception, all these visual cells in the inferior temporal cortex are subject to a chaotic, spasmodic stimulus, or release.

Then suddenly I see a face. Suddenly you see a car.

Suddenly that, and suddenly that.

The mind tries its best to sort this out and give it some kind of consistency, but it doesn't do very well.

When these were first described, they were thought to be interpretable like dreams.

But in reality, people say:

Kermit means nothing to me. ”

Dreaming will get you nowhere.

Well, I said more or less what I wanted to say.

I just want to make a quick recap that this is common.

Consider the number of blind people.

There must be hundreds of thousands of blind people who have these hallucinations but are too scared to talk about them.

So this sort of thing needs to be made known to patients, doctors and the general public.

Finally, I think these are very interesting and valuable in giving insight into how the brain works.

Reflecting on these hallucinations 250 years ago, Charles Bonnet wondered how, in his words, the theater of the mind could be produced by the machinery of the brain.

Now, 250 years later, I think we are beginning to get a glimpse of how this is done.

Thank you very much.

(Applause) Chris Anderson: It was great. Thank you very much.

You talk about these things with great insight and empathy for your patients.

Have you yourself experienced any of the syndromes you describe?

Oliver Sacks: I was afraid you would ask me that.

(Laughter) Well, there are many.

And actually, I myself have some visual impairment.

I am blind in one eye and the other is not so good.

And I see hallucinations of geometric patterns.

But they stop there.

CA: So they don't get in your way?

I understand what's going on, so there's nothing to worry about, right?

OS: Well, except for the ringing in my ears, it doesn't bother me, so I'm ignoring it.

From time to time, I put a lot of pictures in my notebook for my interest.

I myself have had fMRI scans to see how my visual cortex works.

And seeing all these hexagons and intricacies with visual migraines, like me, makes me wonder if everyone sees something like this, and things like cave art and decorative arts are a bit derived from that.

CA: It was a really, really fascinating talk.

thank you for sharing.

OS: Thank you. thank you.

(applause)

A canvas dyed in the shades of the setting sun, colors radiating like a flame.

At first glance, this painting may seem like an impossible and abstract image.

But a closer look reveals the canna lily's soft stems, lush petals, and velvety texture.

This technique of transforming natural subjects into abstract geometry is common in the work of revolutionary American painter and sculptor Georgia O'Keeffe.

But the magic behind this transformation remains as elusive as the artists themselves.

Born in Wisconsin in 1887, O'Keeffe spent his childhood picking wildflowers and arranging fruit and drawing pictures.

At age 17, she moved to Chicago to study at a prestigious art school.

Her teachers trained her to faithfully reproduce reality based on the practices of European masters.

O'Keeffe enjoyed the solitude and detail of the work, but felt little personal connection with it.

After moving to New York, she became more and more drawn to the clean lines, striking compositions and vibrant colors of Japanese art.

O'Keeffe quickly found a teacher who inspired him to put his interests into practice.

Unlike previous teachers, Arthur Wesley Dow encouraged his students to focus on more abstract representations of light, form and color.

These lessons appeared in O'Keeffe's first series of abstract drawings.

Rendered in charcoal, they represent a series of undulating lines, bold shading, and billowing clouds.

These figures ignore easy taxonomies and suggest specific natural references, but they are never exact matches.

Early European painters in the Cubist tradition employed rigid geometry to abstract external subjects.

But here, O'Keeffe tapped into natural forms and rhythms to capture her inner emotions.

Such experiments soon became the basis of an art movement called American Modernism.

Although there is no single style that defines modernist painting, proponents of modernist painting shared a desire to challenge the realist traditions that dominated art education.

Beginning in the late 1910s, modernist painting frequently used geometric shapes and bold colors to explore the American psyche.

O'Keeffe threw himself into these experiments, but was reluctant to share his new findings.

But when a friend sent her charcoal to art dealer Alfred Stieglitz, he was fascinated.

In 1916 he arranged a large exhibition in New York.

This marked the beginning of O'Keeffe's career as a popular artist and the relationship that led to her marriage in 1924.

Marriage did not diminish O'Keeffe's taste for solitude.

She traveled extensively to teach, often hiding away to paint for months at a time.

Whether exploring the craggy canyons of Texas, the tranquil forests of South Carolina, or the sun-bleached deserts of New Mexico, her creative process was grounded in ritual and close observation.

She paid close attention to detail and spent hours mixing paints to create exactly the right color.

Once she found the perfect shade, she recorded it in her ever-growing collection of handmade color cards.

O'Keeffe also experimented with perspective to glorify often-overlooked objects.

In "Ram's Head and Hollyhock" she places weathered skulls and delicate flowers high above the hills below.

This giant skull covers the landscape, casting a new and eerie light on both skeletons and mountains.

The public was captivated by her unique perspective and covert actions.

She was particularly admired for her gigantic floral paintings, ranging from fiery poppies to ghostly calla lilies.

Stieglitz and other critics of the time were obsessed with Freudian psychology and quickly associated these paintings with the female genitalia.

But O'Keeffe rejected such an interpretation.

She resented the male gaze that dominated the world of art and demanded that her work, which emotionally evokes the natural world, be respected.

Eventually, O'Keeffe settled in New Mexico, near one of her favorite artist retreats.

In her seventies her eyesight began to fail, but she continued to explore the mysteries of the landscape using new tactile mediums.

O'Keeffe continued to create until her death at the age of 98 and is remembered as the "mother of American modernism". Decades later, her work still retains a wild energy, as does O'Keeffe's personal mystique.

♫ Where do you go from here? ♫ ♫ How do I keep going? ♫ ♫ I can't get past my doubts ♫ ♫ Climbing scraps ♫ ♫ Falling in our shatters ♫ ♫ Hurt me with everything that could have been ♫ ♫ Repeating pain for pain while playing ♫ With a backup, a makeshift life awaits ♫ ♫ Everyone says ♫ ♫ Time heals all ♫ ♫ What is the miserable void? ♫ ♫ Is the in-between infinite? ♫ ♫ Should I just wait? ♫ ♫ Now there's nothing to see here ♫ ♫ Turn the billboard around ♫ ♫ We're trapped in the earth until we realize more ♫ ♫ Crumbling clichés ♫ ♫ Crumpled, swollen faces ♫ ♫ Dead in a thousand miles' line of sight ♫ ♫ All I want is one street-level miracle ♫ ♫ I'm going to be reborn ♫ ♫ No more cold Not funny ♫ ♫ Everyone says ♫ ♫ Time heals all ♫ ♫ But what about the miserable void? ♫ ♫ Is the in-between infinite? ♫ ♫ Should I just wait? ♫ ♫ And are you cold sitting here? ♫ ♫ By then we'll be gone ♫ ♫ In the dullness ♫ ♫ Rolling around old magazines in the dust ♫ ♫ Fluorescent lights set the scene ♫ ♫ All we can do and should be ♫ Only one life ♫ ♫ Everyone says ♫ ♫ Time heals everything ♫ ♫ And what is that miserable void? ♫ ♫ Is the in-between infinite? ♫ ♫ Should I just wait? ♫ ♫ Just sweat it out? ♫ ♫ Just sweat it out? ♫ ♫ Wait ♫ (Applause)

I'm sure you're worried.

(laughs) I was worried.

I was worried about my vagina.

We were worried about how we felt about vaginas, and even more worried that we weren't thinking about vaginas.

I was worried about my vagina.

It required other vaginal contexts, cultures and communities.

There is a lot of darkness and secrets that surround them.

Like the Bermuda Triangle, no one reports from there.

(Laughs) To begin with, it's not even easy to find your own vagina.

Women go days, weeks, months without looking at anything.

I interviewed a talented businesswoman. She said she didn't have time.

"Looking at the vagina is a day's work," she said.

(Laughter) “Lie on your back in front of the mirror, preferably full body.

You have to hit the perfect light and be in the perfect position, but the angle casts the light into shadow.

Twisting your head and arching your back can tire you out. ”

she was busy she didn't have time.

So I decided to talk to women about vaginas.

They started out as casual vaginal interviews turned into vaginal monologues.

I have spoken to over 200 women.

I have spoken to older women, younger women, married women, lesbians and single women.

I spoke with corporate experts, university professors, actors and sex workers.

I have spoken to African American women, Asian American women, Native American women, White women, and Jewish women.

Well, at first she was a little shy and was a little reluctant to talk.

Once they started moving there was no stopping it.

Women love to talk about their vaginas.

The main reason is that no one has asked the question before.

(Laughter.) Let's start with the word "vagina" -- vagina, vagina.

To put it bluntly, it sounds like an infection.

"Hurry up, nurse, get me a vagina!"

(laughs) Vagina, vagina, vagina.

No matter how many times I say that word, it doesn't sound like what I want to say.

That's a totally silly, totally unsexy word.

If you try to be politically correct and use the words "Darling, can you stroke my vagina" during sex, the act is immediately invalidated.

(Laughter) I'm worried about what to call them or not to call them.

In Great Neck, New York, they call it the Pussycat.

One woman said her mother used to tell her to stop wearing panties under her pajamas.

You need to deflate the pussycat. ”

(Laughter) In Westchester they call it a pookie, in New Jersey they call it a "bastard."

There are Powderbox, Derrière, Pookie, Pooch, Poopie, Poupelle, Pooni Nana, Pade Pache Chiki, Pal and Pichet.

(laughter) Todi, Deedee, Nishi, Dignity, Coochie Snurcher, Cooter, Labbe, Gladys Siegelman, Virginia, Weewee, Horsespot, Nappy Dugout, Mongo, Ghoulley, Powderbox, Mimi from Miami, Split Knish from Philadelphia...

(laughs) I'm worried about my vagina.

Thus begins the "vaginal monologue".

But it didn't really start there.

We were having a conversation about menopause and we were talking about her vagina. If we were talking about menopause, we would.

And she said something about her vagina that really shocked me. That meant the vagina was dry, dead, and dead. And I was kind of shocked.

So I casually said to my friend: "So how do you feel about your vagina?"

And that woman said something even more amazing, and the next woman said something even more amazing. And before I knew it, all the women started telling me I had to tell someone about my vagina. Because they have great stories. And I was sucked into the vaginal marks.

(laughter) And I'm still not out of it.

If I were younger and I said I was going to grow up and be in the shoe store, I think people would scream, "Here it is, it's the vagina lady!"

I don't know if that was my life ambition.

(Laughter) But I want to talk a little bit about happiness and what it has to do with this whole vaginal journey. Because it's an extraordinary journey that began eight years ago.

Before "Vagina Monologues", I don't think I believed in happiness very much.

To be honest, I thought only idiots could be happy.

When I started practicing Buddhism 14 years ago, I was told that the end of this practice was to be happy.

I misunderstood happiness for many other things, such as numbness, decadence, and selfishness.

And as far as the "vaginal monologue" and what happened throughout this journey, I think I've come to understand a little bit more about happiness.

There are three qualities I want to talk about.

One is to see what is in front of you, talk about it, and express it.

What I learned from talking about vaginas and talking about vaginas was that it was the most obvious thing - it was the center of my body, the center of the world - and yet it was the only thing nobody talked about.

Second, talking about vaginas opened the door for me to understand that there are ways to serve to make the world a better place.

And that's where the deepest happiness really comes from.

And the third principle of happiness is one that I recently discovered. Eight years ago, with this momentum and energy, this "V-Wave" began. To be honest, I can only describe it as the "V wave" because I don't fully understand it. I feel it helps.

But since this wave has started, I often experience that if I question the wave, try to stop it, or look back at it, I can get a whiplash or a broken neck.

But if I ride the wave, trust that wave, and move on that wave, I can get to the next place and it will happen logically and organically and true.

And I started this work specifically with stories and stories. I spoke to one woman, which led to another woman, and then to another woman.

Then I wrote those stories down and presented them in front of others.

And every time I did my first show, the women would literally line up after the show. Because they want me to tell their stories.

And at first I thought, "I'm going to hear about great, great orgasms and great sex lives and how women love their vaginas."

But really, it's not about the women who lined up to tell me.

Women lined up to tell me how they had been raped, how they had been assaulted, how they had been beaten, how they had been gang raped in parking lots, how they had been incested by their uncles.

And I wanted to stop "Vagina Monologue" because it was too daunting.

I felt like a war photographer taking pictures of horrific events but not intervening for them.

So in 1997 I said, 'Let's get the women together.

What can we do with this information that all these women are being sexually assaulted?"

And after some thought and research, I found that 1 in 3 women on this planet will be beaten or raped in their lifetime. The United Nations recently said so.

It's essentially gender. It is essentially the resource of the planet: women.

So in 1997, we brought together an amazing group of women and said, "How can we use this play, this energy, to stop violence against women?"

And we had an event in a theater in New York City. And all the great actors, from Susan Sarandon to Glenn Close to Whoopi Goldberg, came out and did one performance in one night. And that fueled this wave, this energy.

And within five years, this crazy thing started happening.

One woman took that energy and said, "I want to bring this wave, this energy to college campuses."

In one year, it was introduced to 50 colleges and expanded.

And in the last six years, it has spread, spread and spread all over the world.

I learned two things. For one, the prevalence of violence against women is shocking. it's global. It's so deep, so destructive, it's in every little pocket of every little crater, in every little society, that it's become so common that we don't even realize it.

This trip brought me to Afghanistan. There I had the special honor and privilege of going to parts of Afghanistan under Taliban rule.

I wore a burqa and entered with a special group called the Afghan Women's Revolutionary Association.

And I saw how women have been stripped of every right they could take, from education to employment to permission to actually eat ice cream.

For those who don't know, eating ice cream was illegal under the Taliban regime.

And I actually saw and met women who were found eating vanilla ice cream and were whipped.

I was taken to a secret ice cream parlor in a small town and went to a back room where the women sat and the curtains were drawn and vanilla ice cream was served.

And the women lifted their burqas and ate this ice cream.

And until that moment, I don't think I've ever understood joy and how women find ways to maintain it.

This trip took me to Islamabad where I witnessed and met women whose faces had been melted.

I was taken to Juarez, Mexico. At the place I visited a week ago, I was literally in a parking lot where the bones of a woman were washed up and dumped next to a bottle of Coca-Cola.

I have been taken to colleges all over the country where girls are date raped and drugged.

I've seen horrible, horrible, horrible violence.

But in the process of seeing that violence, I also realized that facing things and actually seeing what was in front of me was the antidote to depression and feeling worthless and unworthy.

Because before the "vaginal monologue" began, 80 percent of my consciousness was closed to what was actually happening in this reality, and that closure closed my vitality and life energy.

What also happened during the course of these trips, which was amazing, was that everywhere I went in the world, I encountered new species of animals.

And I really love hearing about all these species at the bottom of the ocean.

And I was thinking about being with these extraordinary people on this particular panel, it's down, over and in between, and the vagina is something that fits into all those categories.

(Laughter.) But one of the things I've seen is this species. It's a seed, a new paradigm. It is not covered by the press or media. Because I think good news is never news. Also, I don't think the people trying to change the planet will get ratings on TV shows.

But in every country I've visited, and in the last six years I've visited about 45 countries, and many tiny little villages and cities and towns, I've seen what I've come to call 'the vagina warrior'.

A "vagina warrior" is a woman or a vagina-friendly man who has witnessed or endured incredible violence, holding the violence within her own body rather than acquiring an AK-47, a weapon of mass destruction, or a machete. they mourn it. they experience it. And they go out and dedicate their lives to making sure the same thing doesn't happen to others.

I have met these women all over the planet. And I would like to tell you some stories. Because we believe stories are the way we transmit information and it enters our bodies.

I think one of the things that's really interesting about being at TED is that I live a lot in my body and not so much in my head.

And this is where it really hurts.

And it's been really interesting what's going on in my head over the past two days. I was very confused -- (laughter) because I think the world, the V-world, is solidly present in your body.

It is the physical world and the seed actually exists in the physical body.

And I think it really makes sense that we put our heads and bodies together. That separation often creates a division where purpose and intention are separated.

And the body-head connection often fuses them together.

I want to talk about three specific people I've met so far, the Vaginal Warriors. They really changed my understanding of this principle and the species as a whole. One of them is a woman named Marcia Lopez.

Marsha Lopez is a woman I met in Guatemala.

She was 14 years old, married, and was regularly beaten by her husband.

And she couldn't get out of it because she was dependent on the relationship and had no money.

Her sister is younger than her, and a few years ago there was a "Stop Rape" competition in New York, and she entered in hopes of being a finalist and taking her sister with her.

She became a finalist. She took Masha to New York.

And back then, we had this extraordinary V-Day at Madison Square Garden. The entire testosterone-filled dome sold out. 18,000 people said 'yes' to the vagina and this was truly an incredible transformation.

And she came, witnessed this, and decided to leave her husband, return home, and have V-Day in Guatemala.

she was 21 years old.

I went to Guatemala and the Guatemalan National Theater was sold out.

And I saw her come on stage in a short red dress and high heels, and she stood there and said, 'My name is Marsha.

I was abused by my husband for 5 years. he almost killed me

I'm gone, you can too ”

And all 2,000 went completely insane.

There is a woman named Esther Chavez whom I met in Juarez, Mexico.

Esther Chavez was a distinguished accountant in Mexico City.

She was 72 years old and was due to retire.

She went to Juarez to care for her sick aunt, and in the process began to find out what was happening to the murdered and disappeared Juarez women.

she gave her life. She moved to Juarez.

She began writing stories documenting missing women.

In a border town, 300 women disappeared because they were brown and poor.

There has been no reaction to the disappearance and no one has been held accountable.

She started documenting it.

She opened a center called Casa Amiga and in six years literally brought this to the world consciousness.

When we visited there a week ago, 7,000 people were in the streets, which was truly a miracle.

And as we walked through the streets, the streets were so dangerous that the people of Juárez, who normally wouldn't even come to the streets, literally stood there crying as they saw other people from all over the world showing up for their community.

There is another woman named Agnes.

To me, Agnes epitomizes the Vaginal Warrior.

I met her in Kenya three years ago.

and Agnes was amputated at an early age. She was circumcised against her will when she was ten years old. And she really decided that she didn't want this custom to continue in her area.

So when she got older, she made this incredible thing. It is an anatomical sculpt of the female body, half of the female body.

And she walked the Rift Valley with vaginas and vaginal replacement parts, where she taught girls and parents, boys and girls what a healthy vagina looked like and what an amputated vagina looked like.

And in the course of her journey--she literally walked for eight years through rift valleys, walking in dust, sleeping on the ground. Because the Maasai are nomads and she has to find them, they will move and she will find them again – she saved 1,500 girls from being cut.

And during that time, she devised an alternative ritual for girls to come of age without cutting off their hands.

When I met her three years ago, we said, "What can V-Day do for you?"

And she said, "If you could lend me your jeep, I could move faster."

(laughs) So we bought her a Jeep.

And in the year she owned the Jeep, she saved 4,500 girls from being cut.

So we asked her, "What else can we do?"

She said, "Yes, Eve, if you give me money, I can open the house, the girls can escape, and they may be saved."

And I want to tell you this little story about my own beginnings. That's because it is very closely related to happiness and Agnes.

When I was little, I grew up in a wealthy community. It was an upper-middle-class white community, perfectly fine, with all the decorations and appearances of a fine, fine life.

And while everyone was supposed to be happy in that community, my life was actually hell.

I lived with an alcoholic father who used to beat me, molested me, and it was all in it.

And when I was a kid, I always had a fantasy that someone would come and help me.

And actually I made a little character named Mr. Crocodile.

When things got really bad, I called him and said it was time to pick me up.

Then I packed my little bag and waited for Mr. Crocodile to come.

Well, Mr. Alligator never came, but the idea of ​​Mr. Alligator coming actually saved my sanity and made me think it's okay to move on. Because I believed that someone in the distance would come to my aid.

Some 40 years later we went to Kenya and on our walk we arrived at the opening of this house.

And Agnes didn't let me come to her house for days as she was preparing for this whole ceremony.

When Agnes first started fighting to stop female genital mutilation in her community, she was marginalized, ostracized and vilified, and the whole community turned against her.

But the Vaginal Warrior, she kept moving forward and remained committed to transforming consciousness.

Goats and cattle are the most valuable possessions of the Maasai community.

They're like the Mercedes-Benz of the Rift Valley.

And two days before the house opened, she said, two different people arrived to give her each a goat, "that's when I knew female genital mutilation would one day end in Africa."

Anyway, we arrived. Upon arrival, we were greeted by hundreds of girls dressed in handcrafted red dresses, the color of the Maasai people and V Day.

They made a song about the end of suffering and the end of amputation and had us walk that path.

It was a beautiful day in the African sun, dust and dancing girls. There was this house on it that said 'V Day Safe House for Girls'.

And at that moment I thought, after 47 years, Mr. Alligator had finally appeared.

And he clearly appeared in a form that took me a long time to understand. It is that the broken part within each of us is healed when we give the world what we want most.

And for the last eight years, I feel that this journey, this miraculous vaginal journey, has taught me this really simple thing. Happiness is in action. It exists by speaking the truth and saying what your truth is. And it exists in giving you what you want most.

And I feel that knowledge and that journey have been an extraordinary privilege, and I feel truly blessed to be here today to share it with you.

thank you very much.

(applause)

My name is Jonathan Zittrain. I've become a bit of a pessimist in my recent work.

So this morning, I thought I'd use the current state of the Internet to give hope to the future of the Internet, whether you're an optimist or not.

Well, it may seem less hopeful today than it used to be.

People are not very friendly. You will lose the trust of those around you.

don't know. As a simple example, you can run the test here.

How many people have ever hitchhiked?

know. How many people have hitchhiked in the last 10 years?

right. So what changed?

Public transport is not better.

This is one of the reasons I think we might be misguided segregationists.

But let me give you three examples to show you that the trend line is actually going in the opposite direction, and it's the internet that's helping.

One example is the Internet itself.

These three are the founders of the Internet.

In fact, they were high school classmates who attended the same high school in the suburbs of Los Angeles in the 1960s.

There may have been a French club or a debate club.

They had a club called 'Let's build a global network' and it worked really well.

Here are some photos from the 25th Anniversary Newsweek Retrospective on the Internet.

And you see, they're basically antics.

There was one big limitation and one big freedom when they tried to envision a global network.

The limit was no money.

You don't need to invest extra capital like physical networks that need hubs to move trucks, people and packages overnight.

They had nothing of the sort.

But they had amazing freedom. That is, there was no need to make money with it.

There are no business plans on the Internet, nor have there ever been.

Neither the CEO nor the company is solely responsible for building it.

Rather, they aren't gathering because someone told them to, or hoping mints will make money, but are gathering to do something for fun.

This ethos led to the network architecture, a structure unlike any other digital network of that time or later.

In fact, it is said that it is so unusual that it is unknown whether the Internet will work.

As of 1992, IBM is known to have stated that it was impossible to build corporate networks using Internet protocols.

And some Internet engineers today say that the whole thing is a pilot project with no conclusions yet.

(Laughter) That's why they say that if there's ever been a mascot for internet engineering, it's the bumblebee.

This is because the bumblebee's fur-to-wingspan ratio is too large to fly.

And yet, strangely enough, the bees somehow fly away.

About three years ago, thanks to huge amounts of government funding, I'm happy to finally figure out how bees fly.

(Laughter) It's very complicated, but it turns out that they fly very fast.

(Laughter) So what is this strange architectural configuration that makes networks so insane?

Well, moving data from one place to another is still different than parcel courier.

It's more like a mosh pit.

(Laughter) Imagine that. Suppose you are part of a network. Imagine you're at a sporting event and you're sitting in line like this, and someone asks for a beer and is handed it down the aisle.

And your neighbor's duty is to deliver the beer to its destination at the risk of landing in your pants.

No one pays you to do this.

It's just part of your neighbourhood.

And in a way, this is exactly how packets travel across the Internet, sometimes 25 or even 30 hops, and the intervening entities exchanging data have no specific contractual or legal obligations to the original sender or receiver.

Now, of course, it's hard to specify a destination in a mosh pit.

It takes a lot of trust, but it's not like, "I want to go to Pensacola, please."

Therefore, the Internet needs addressing and direction.

It turns out that a global map of the Internet does not exist.

Instead, again, it's like we're all sitting together in a theater, but in the fog, we can only see the people right around us.

So how do you know who is where?

We turn to the person on the right and tell him what we see on the left. And vice versa.

Then you can repeat lathering and rinsing. And before you know it, you get a rough sense of where everything is.

This is how Internet addressing and routing really works.

It's a system that relies on kindness and trust, so it's also a very sensitive and vulnerable one.

In a rare but striking example, just one lie with just one existence in this honeycomb can cause big problems.

So, for example, last year the Pakistani government asked its internet service providers to block Pakistani citizens from watching YouTube.

There was a video there that the government didn't like and they wanted to make sure it was blocked.

This is common. Governments everywhere often try to block, filter, or censor content on the internet.

Well, this Pakistani ISP has chosen to block its subscribers in a rather unusual way.

It advertised in a way that if it were part of the Internet, one might be asked to declare something near oneself, near it, in fact, one suddenly woke up and realized it was YouTube.

"Yeah, I'm YouTube," I said.

In other words, a packet of data from a subscriber accessing YouTube was stopped at the ISP thinking it was already there, and the ISP threw it away unopened because their goal was to block it.

But that was not all.

You know, that announcement was sent in one click, it resonated, it was sent in one click.

And a post-mortem analysis of this event showed that at one point YouTube was working perfectly.

Then, at moment 2, play a fake announcement.

Within two minutes, the sound reverberates around you, blocking YouTube anywhere in the world.

If you sit in Oxford, England and try to access YouTube, the packets go to Pakistan and never come back.

Now let's think about it.

It's one of the most popular websites in the world, run by the world's most powerful companies, and neither YouTube nor Google had any special privileges with it.

Yet somehow the problem was resolved within about two hours.

How did that happen?

Now, we turn to NANOG for a big clue.

The North American Network Operators Group is a group of people who walk into a windowless room on a sunny day, read e-mails and messages on their terminals in fixed-ratio font, and talk about networks.

And some of them are mid-level employees of internet service providers around the world.

And here's a message, one of them saying, "Looks like there's a live. YouTube has been hijacked!"

This is not training. It's not just the ignorance of YouTube engineers. i promise.

Something is happening in Pakistan. ”

And they banded together to find and solve the problem.

It's like the house caught fire.

The bad news is that the fire brigade doesn't exist.

The good news is that people will appear out of nowhere, put out the fire and walk away, with no expectation of reward or praise.

(Applause.) I was trying to come up with a good model for explaining random acts of kindness by nerdy strangers like this.

(Laughter) You know, it's just like hail and people come to help.

And when you start looking, you will find that this model is everywhere.

Example 2: Wikipedia.

If a guy named Jimbo came up to you in 2001 and said, "I've got a great idea! We're going to start with seven articles that anyone can edit at any time, and we'll have a great encyclopedia! Huh?"

right. The stupidest idea ever.

(Laughter) In fact, Wikipedia is such a stupid idea that not even Jimbo could have come up with it.

Jimbo's idea came from Nupedia.

It will be completely traditional. He pays people because he feels he is a good person, and the money goes to people and they write the articles.

Wikis were introduced to allow others to suggest edits. It's almost an afterthought, as a back room.

And it turns out that the backroom has grown to cover the entire project.

And today, Wikipedia is ubiquitous, even Chinese restaurant menus feature Wikipedia.

(Laughter) I'm not making this up.

(Laughter) I have a theory, and I'll explain it later.

Just for the record, I prefer stir-fried peppers from Wikipedia.

(Laughter) But now Wikipedia doesn't just work spontaneously.

How does it work in practice? Metaphorically speaking, it turns out that there is a back room with no windows.

And on a sunny day, many people want to go inside and monitor the admin's bulletin board, which is a wiki page that anyone can edit.

And just bring the problem to the page.

It's reminiscent of historical depictions of "one terrible thing after another."

The first is "Meticulous editing by user Andyvphil".

Andiv Phil, I'm sorry if you're here today.

I'm not on either side.

"Anon is attacking me for putting me back together."

My favorite is "The Long Story".

(Laughter) It turns out that there are more people checking this page and wanting to fix the problem than the problem that's happening on this page.

And that's what keeps Wikipedia alive.

Wikipedia always takes about 45 minutes to be completely destroyed. right?

There are spambots patrolling there, trying to turn every article into an ad for a Rolex watch.

(Laughter) This thin nerdy line keeps it going.

Not because it's a job, not because it's a career, but because it's a vocation.

They care about it, so they feel they have to.

They even gather in groups like the Anti-Vandalism Unit of "Courtesy, Maturity, Responsibility" just to organize the page.

For example, if there's a big, hugely popular Star Trek convention one weekend, who cares about the store?

(Laughter) So what we're looking at -- (Laughter) what we're seeing in this phenomenon is what the late mad traffic engineer Hans Mondermann discovered in the Netherlands and here in South Kensington. Sometimes removing the external rules and signs and all that stuff actually gives people a safer environment in which to operate, and an environment in which they feel more human.

They recognize that they must take responsibility for their actions.

And Wikipedia accepts this too.

Some of you may remember the Star Wars Kid. The Star Wars Kid was a poor teenager who filmed himself holding a golf ball retriever and acting as if he were a lightsaber.

The film went viral on the Internet, initially without any knowledge of his permission.

A very viral video. Very popular.

It's a real shame for him.

Well, more than encyclopedic, Wikipedia had to create an article about the Star Wars Kid.

Every article on Wikipedia has a corresponding discussion page, which has led to extensive discussion among Wikipedians about whether or not to include his real name in the article.

I have seen both claims.

Here is a snapshot of some of them.

Despite the fact that almost all media reports, they ultimately, but by no means unanimously, decided not to publish his real name.

They didn't think it was right.

It was an act of kindness.

And to this day, the "Star Wars Kid" page still displays a warning not to put his real name at the top of the page.

If you do, it will be removed quickly, by people who may not have agreed with the original decision, but because they believe in something greater than their own opinion, they will respect the consequences and try to make sure it stays.

As lawyers, I have to say that they invent the law, watch the decisions and so on.

Now, this is not limited to Wikipedia.

I'll see you on my blog.

So this is the 2005 Business Week cover.

oh. Blogs change your business.

I know they look stupid. And sure they look stupid.

They undertake all sorts of ridiculous projects.

This is my favorite goofy blog: Catsthatlooklikehitler.com.

(Laughter) I send you a picture of a cat that looks like Hitler.

(Laughter) Yes, I know. Fourth, can you imagine that cat coming home every day?

(Laughter.) But it turns out that the same quirkiness applies to people.

So this is a blog dedicated to unfortunate portraits.

This includes "An idyllic meadow with a split rail fence.

Is that an animal carcass behind her? ”

(Laughter) It's like, "You know what? I think that's the dead animal behind her."

And it's one after another.

But then you hit this. Image removed at owner's request.

that's it. Image removed at owner's request.

Now it turns out that someone wrote to the nasty man who runs the site, not with legal threats or offers of payment, but with a simple "Hey, are you okay?"

The person said, "No, I'm fine."

We believe we can build an architecture online that can perform such human requests much more easily. We will all be able to understand that the data we encounter online is really just a click-and-paste, copy-and-transfer thing that represents human emotions, efforts, and impacts, and we will be able to have an ethical moment to decide what we want to do with it.

I think it can even be applied in the real world.

In a world of increasing censorship, there will be things filming you and putting you online everywhere, but we may eventually be able to wear a little clip that says, "I know, I better stop."

And have a technology that allows the person who took the photo to know it later. If you don't mind, this person has requested to be contacted before this becomes too big.

And the person taking the photo can decide how or not to honor it.

In the real world, we see this kind of filtering in action in Pakistan.

And now we have tools like this system that people can build to report when they encounter filtering.

And it’s no longer just “I don’t know.

In fact, it may be that technology imitates life that imitates technology, or vice versa.

Here, the New York University researchers brought in a small cardboard robot with a smiling face on it, a motor that propels the robot forward, and a flag sticking out behind it with the desired destination.

It read, "Can you help me get there?"

Released on the streets of Manhattan.

(Laughter) They fund anything these days.

This is a graph showing how over 43 people helped control a robot that could not be steered, and successfully ran it from corner to corner in Washington Square Park.

That brings us to our third example, hitchhiking.

I don't know if hitchhiking has become obsolete.

why? There is a Craigslist rideshare board.

If it was called a Craigslist hitchhiking board, tumbleweeds would be blowing through it.

But this is a rideshare board, basically the same thing.

So why are people using it?

don't know. Perhaps they think murderers don't plan ahead?

(Laughter.) No, I think the real answer is that once you rebuild it and get out of the old expectations from a project that failed and got its day and is now for some reason bruised, you can actually rekindle the kind of human kindness and sharing that something like this on Craigslist represents.

And you can highlight it to something like "CouchSurfing.org".

CouchSurfing: One guy's idea to finally connect people who travel far away and want to sleep on a stranger's couch for free with people who live far away and want a stranger to sleep on their sofa for free.

Great idea.

Yes, bees fly.

It's amazing how many people have found success with couchsurfing.

In case you were wondering, no, there are no known fatalities related to CouchSurfing.

Admittedly, the reputation system currently works to leave a report after your couchsurfing experience, which could bias your selection.

(Laughter) So, I would argue strongly that the Internet is not just a pile of information.

it is not a noun. it's a verb.

And as you go along, if you listen carefully and look close enough, you'll know that the information is telling you something.

What it tells you is what we heard yesterday, what Demosthenes was telling us.

It means "let's march". thank you very much.

(applause)

good morning. As a picky Eastern European, I guess I was brought in this morning to play the pessimist. So be patient.

I come from the former Soviet republic of Belarus, and as some of you may know, Belarus is not an oasis of liberal democracy.

That's why I've always been interested in how technology can actually reshape and liberate authoritarian societies like ours.

So when I graduated from university, in a very idealistic way, I decided to join an NGO that was actually using new media to promote democracy and media reform in much of the former Soviet Union.

But to my surprise, I found out that dictatorships do not fall so easily.

In fact, some of them survived the challenges of the Internet, while others became even more oppressive.

So I exhausted my idealism, quit my NGO job, and decided to actually study how the Internet could hinder democratization.

Now, I must tell you that this was never a popular discussion, and is probably still not very popular among this audience.

This was never popular with many political leaders, especially those in the United States who vaguely believed that the new media could do what missiles could not.

It is about promoting democracy in difficult places where all else has already been tried and failed.

And by 2009, I think the news had finally reached the UK, so perhaps Gordon Brown should be added to this list as well.

But there is a fundamental debate when it comes to logistics, and that's a big reason for this debate. right?

So if you look closely enough at this, you'll find that a lot of it is actually about economics.

Cybertopians argue that people will inevitably revolt because blogs and social networks have fundamentally changed the economic fabric of protest, much like fax machines and Xerox did in the 80s.

Quite simply, the premise so far has been that giving people enough connectivity and devices will inevitably lead to democracy.

And to tell you the truth, I didn't quite agree with this argument. One reason is that we've never seen three American presidents agree on anything else before.

(Laughter) But beyond that, if you think about the logic behind it, this is what I call iPod liberalism, assuming that every Iranian or Chinese who happens to have and loves their own iPod will also love liberal democracy.

And again, I think this is kind of wrong.

But I think the bigger problem with this is that this logic -- that you should drop the iPod instead of the bomb -- makes for a compelling title for Thomas Friedman's new book.

(Laughter) But this is rarely a good sign. right?

So the bigger problem with this logic is that it confuses the intended use of the technology with the actual use.

Anyone who thinks the new medium of the internet can somehow avert genocide should look no further than Rwanda. In the 90s, it was actually two radio stations that fueled much of the ethnic hatred in the first place.

But beyond that, when you go back to the internet, what you really see is that certain governments are leveraging cyberspace for propaganda purposes. right?

And they're building what I call the Spin Internet.

A combination of spins on the one hand and internet on the other.

That is why governments from Russia to China to Iran actually hire, train, and pay bloggers to leave ideological comments, or to create dozens of ideological blog posts to comment on sensitive political issues. right?

So you may be wondering why on earth they would do such a thing.

Why are they involved in cyberspace?

My theory is that this is happening because censorship is actually less effective in many places than you might think.

The moment you write something important on your blog, even if you can get it banned right away, that information will spread to thousands of other blogs.

So the more you block, the more you actually encourage people to circumvent censorship and win this cat-and-mouse game.

So the only way to control this message is to actually spin it and accuse the person who wrote the critical content of being, say, a CIA agent.

And, again, this is happening quite often.

Let's take for example how it works in China.

In February 2009 there was a big incident called "Elude the Cat".

For those unfamiliar, here's a quick overview.

What happened there was a 24-year-old Chinese man who died in custody.

And police said it happened because he was playing hide-and-seek (Chinese slang for "avoiding cats") with other inmates and banging his head against a wall, an explanation that many Chinese bloggers weren't satisfied with.

As such, they immediately began posting many critical comments.

In fact, QQ.com, a popular Chinese website, had 35,000 comments on the issue within hours.

But then the authorities did something very clever.

Rather than trying to delete these comments, they went to reach out to the blogger instead.

And they basically said, ``We want you guys to be internet user investigators.''

Therefore, 500 people applied, and 4 people were selected to actually visit the facility, inspect it, and introduce it on the blog.

The whole incident was forgotten within days, but simply trying to block the content would never have happened.

People kept talking about it for weeks.

And this actually fits in with another interesting theory about what happens in authoritarian states and their cyberspace.

This is what political scientists call authoritarian deliberation, and it happens when governments are actually reaching out to their critics and interacting with them online.

We tend to think that this will harm the dictatorship in some way, but more often than not it only strengthens the dictatorship.

And you may wonder why.

Here is a very short list of reasons why authoritarian deliberations might actually help dictators.

And first it's very easy.

Most of them operate in a complete information vacuum.

They don't really have the data they need to identify new threats facing the regime.

So it's great to encourage people to actually go online and share information and data on blogs and wikis. Otherwise, low-level apparatists and bureaucrats will continue to cover up what is really going on in this country.

From this perspective, it's great that blogs and wikis generate knowledge.

Second, involving the public in decision-making is highly effective as it helps share responsibility for policies that ultimately fail.

Because they say, "Look, we asked you, we consulted you, and you voted for it.

I put it on the top page of my blog.

Well, great. You are responsible. ”

And finally, the purpose of authoritarian deliberative activities is usually to enhance the legitimacy of domestic and foreign regimes.

So inviting people to any kind of public forum and having them participate in decision-making is actually great.

Because you can actually point to this initiative and say, "Well, we have a democracy. We have a forum."

For example, in one region of Russia, for example, the public is currently participating in the planning of the strategy to 2020.

right? So they can go online and post their ideas of what the area might look like by 2020.

I mean, if you've been to Russia, you know that there was nothing planned in Russia for the next month.

So getting people involved in planning for 2020 doesn't necessarily change anything. Because it is still the dictator who controls the agenda.

To take Iran as an example, we've all heard about the Twitter revolution that took place in Iran, but if you take a closer look, you'll find that many networks and blogs, Twitter and Facebook were actually in action.

They may have slowed down, but activists still have access to it, and indeed claim that having access to them is a great thing for many autocratic nations.

And it's great for the simple reason that it allows us to gather open source intelligence.

It used to take weeks, if not months, to identify how Iranian activists were connected.

You can actually see how they are connected by looking at their Facebook page.

So it wasn't just the KGB, the KGB actually used torture to get this data.

All available online now.

(Laughter) But I think the biggest conceptual pitfall Cybertopian has committed is with digital natives, people who grew up online.

We often hear about cyber activity, how people are more active thanks to the Internet.

We hear very little about cyber hedonism, for example, how passive people are becoming.

why? Because they vaguely assume that the internet will be the catalyst for change that will get young people out on the streets, but in reality it may be the new opium for the masses that keeps the same people in their rooms and downloads porn.

It's not an option that's being considered very strongly.

So for every Digital Rebel rebelling in the streets of Tehran, there are actually two digital prisoners rebelling only in World of Warcraft.

And this is realistic. And there's nothing wrong with that, because the internet has given so many of these young people so much power and played a completely different social role for them.

If you look at some research on how young people actually benefit from the internet, you'll find, for example, that the internet has actually broadened their sexual lives for three times as many Chinese teens as in the US.

In other words, they play a social role, but they don't necessarily lead to political engagement.

So the way I tend to think of it is like a hierarchy of cyberneeds in space, a complete ripoff from Abraham Maslow.

But the point here is that when Russia's remote villages are published online, it's not the Human Rights Watch report that directs people to the internet.

You might end up watching porn, "Sex and the City," or funny cat videos.

So this is something we have to recognize.

So what should be done about it?

I say we need to stop thinking about iPods per capita and start thinking about how to empower intellectuals, dissidents, NGOs, and members of civil society.

Because even what has happened so far with spin internets and authoritarian deliberations, it is very likely that those voices will not be heard.

So I think we should break down some utopian assumptions and start doing something really about it.

thank you.

(applause)

So here we are.

I'm sure there are many of you, but I'm at home.

And we are all beginning to understand how our relationship to ourselves, to each other, and the space we live in can profoundly affect our identity and sense of purpose.

So many things have changed dramatically.

There is a sense of distance that is different from before.

But what if I told you that you can find a way from your heart to your hands to reconnect, and that through embracing this practice and this cause, I can help you recalibrate your mind so that you can explore this new reality with joy, enthusiasm, imagination and hope?

All you need is a simple pen.

To get there, let's go back to the beginning.

As a child growing up on public estates in South East London, I was an outsider.

I am the eldest of six siblings, all of whom are very British-like, blonde, blue-eyed, and very pretty.

And then there was me, half Nigerian, half brown, with afro hair.

So what happens when you look different, feel different, and in many ways start thinking differently than everyone and everything around you?

How do you find your way out of a dark, racist, homophobic, and very lonely place?

This is where the pen comes into play.

I started drawing.

As you can see, I have this pen and I know where it's going.

And I learned very well how to follow it.

And the first thing I did was follow this line and save myself from a culture that only taught me what I couldn't do.

I trusted my pen and it led me to Central Saint Martins, a very prestigious art school in London, where I graduated first-class.

However, I quickly realized that there was no place for me in London. Believe it or not, Britain is still a country rooted in and operating within a class system.

And as a young black, gay, female artist born into a working-class family, I didn't stand a chance.

So I left London and moved to Japan, where I was never asked where I really came from.

I was just a gaijin, which ironically means "outsider".

I was immersed in a culture that respects both craft and craft, where people have been perfecting their craft for generations.

It is a culture that allows artists to master both time and space and create with true freedom.

And what I discovered was where I wasn't angry.

Tokyo did me no wrong.

I could no longer create with anger and pain.

I had to be brave and allow myself to create from somewhere else.

And what I discovered was that this wonderful tool goes beyond the lines on paper.

I have found something that connects my head, my heart, and my hands with everything.

I was able to see the world in a new way.

I found connections around every corner and solutions to problems I didn't know existed.

I feel like I've come to see a world with both positive and negative spaces.

And when I saw it, I was no longer afraid.

My pen was like a flashlight and the unknown was still there, but I wasn't scared.

After living in Japan for 5 years and concentrating on my craft, I felt I needed a new challenge.

So I moved to New York. That's your job as an artist, right?

You move into the greatest city in the world with the ability to make yourself completely and utterly invisible.

At this point, I began to seriously ask myself, "Who are you?"

I woke up in the morning and meditated on this before starting my day.

I continued to draw while having such doubts.

I followed that line.

I let it lead.

The process of picking up a pen that everyone has access to, the act of giving myself permission to let go of all thoughts, all fears, anxieties—everything that gets in the way of allowing myself to be wholly I am—it became my way of experiencing freedom.

When I got to New York, I wasn't going to follow the rules of the art world.

I continued practicing as an outsider.

I kept drawing.

Curiosity became the ink in my pen and I continued to dive deeper.

Over time, I started creating a space for my bold, confident self—a space that was all about me.

At first it was just my bedroom.

But when that bedroom was published in The New York Times, suddenly my world was being noticed and known.

Since then, I have created and collaborated with some of the most unique artists, institutions and spaces, from the Times Square screen to the New York City Ballet's incredible Artist Series. I interviewed many dancers there.

Their stories and words formed the basis for more than 30 paintings and works of art that cover the walls, windows and floors of the promenade.

For a long time I wanted to create a space for meditation and poetry.

And in 2019, Governors Island Trust gave me the opportunity to do just that.

They provided me with a perfect canvas in the shape of a former military chapel.

Introducing "Mailroom".

The exterior is painted with images of the history of the island, and when you take off your shoes and enter, you will find a maze-like painting on the floor that reminds you of the history of the island.

It's an invitation to be calm.

This will allow you to see the phrases on the wall.

"May you be wise."

"May you have a good night's sleep."

"May I save the tree."

"Hope you can", "Hope you can", "Hope you can".

And these phrases seem to well up from you or fall into you.

I let my lines be like a language, a language that unfolds like life.

And when there was a period of silence, I sought connection through conversation and asked questions to overcome my discomfort.

Drawing taught me how to make my own rules.

It taught me to open my eyes to see what could be, not just what is.

And even if you have a broken system, you can create a new system that actually works and benefits everyone, not just a select few.

Painting taught me how to fully engage with the world.

And what I've realized through the language of this line is not the importance of being seen, but rather the gift of seeing that we give to others, and how real freedom is the ability to see.

This is not meant literally as sight is just one of the ways a person can see.

But what I mean is to experience the world in its entirety. Even more so in the most difficult moments, such as the ones we face today.

My name is Shantel Martin.

I paint.

Pick up a pen and see where it goes.

(music)

thank you.

Two years ago, I was on the TED stage in Arusha, Tanzania.

I talked very briefly about one of my proudest works.

It was a simple machine that changed my life.

Until then, I had never left my home in Malawi.

I had never used a computer before.

I never even looked at the internet.

I was very nervous on stage that day.

My English has deteriorated and I feel like throwing up.

(Laughter.) It was the first time I was surrounded by so many Azung white people.

(laughs) There was something I couldn't say at that time.

But hey, I feel better now.

I would like to talk about that today.

My family has 7 children.

All my sisters except me.

This is a picture of me when I was young with my father.

Until I discovered the wonders of science, I was just a farmer in a poor farmer's country.

We used to grow corn, just like everyone else.

One year our fortunes turned very bad.

In 2001 we experienced a terrible famine.

Within five months, all Malawians began starving to death.

My family ate one meal a day and one at night.

Only 3 cups of Nsima for each of us.

Food passes through our bodies.

we fall into nothingness.

In secondary education in Malawi you have to pay school fees.

Hunger forced me to drop out of school.

I turned to my father and saw that dry field.

The future was unacceptable.

I felt very happy to be enrolled in secondary school and decided to do whatever I could to get an education.

So I went to the library.

I read books, science books, especially physics.

I couldn't read English very well.

I used diagrams and pictures to learn the words around them.

Another book gave me that knowledge.

Windmills can pump water to generate electricity.

Pumped water meant irrigation, defense against the hunger we were experiencing at the time.

So I decided to build my own windmill.

However, I didn't have any materials to use, so I went to the scrapyard and found materials there.

Many people called me crazy, including my mother.

(laughs) I found a tractor fan, a shock absorber, and a PVC pipe.

I built a machine using a bicycle frame and an old bicycle dynamo.

At first it was one light.

And there are four lights with switches modeled after electric bells, and even a circuit breaker.

Another machine pumps water for irrigation.

At my house, people started lining up to charge their phones (laughs).

(Applause.) We couldn't get rid of them.

(Laughter) And then the reporters came, which led to bloggers, which led to calls from this thing called TED.

I had never seen an airplane before.

I had never stayed in a hotel before.

So, on stage in Arusha that day, even though my English was poor, I said something like, "I tried, and I did it."

So I would like to say to the Africans and the poor who, like me, are struggling to achieve their dreams.

god bless.

Maybe one day you will also see this on the internet.

I say to you, believe in yourself, believe in yourself.

No matter what happens, don't give up.

thank you.

(applause)

Well, 90 percent of my photo process isn't really a photo.

This includes writing letters, surveys and calling campaigns to reach my target audience, from Hamas leaders in Gaza to hibernating black bears in caves in West Virginia.

And oddly enough, the most notable rejection letter I've ever received came from a seemingly innocuous site, Walt Disney World.

Then read the important sentences. “Especially in these violent times, I personally believe that the magical spells cast on theme park guests are especially important to protect and help provide an important fantasy for them to escape.”

Pictures threaten fantasy.

They didn't want my camera inside. This is because the camera confronts constructed realities, myths, and beliefs, and provides what appears to be evidence of truth.

But every image has multiple truths attached to it, depending on the intentions of the creator, the viewer, and the context in which it is presented.

In the five years since 9/11, when American media and government have searched the hidden and unknown places beyond our borders, especially weapons of mass destruction, I have chosen to look inward at what is essential to America's founding, mythology, and daily life.

I wanted to confront the pragmatic self-imposed civic boundaries and confront the divide between privileged and public access to knowledge.

It was a pivotal moment in American and world history when people felt they had no access to accurate information.

I wanted to see the center with my own eyes, but all I got was a photo.

And that is another place to observe, the understanding that there are no absolute, all-knowing insiders.

And an outsider can never get to the core.

Here are some photos from this series.

The title is "An Index of Hidden and Unknown America" ​​and consists of nearly 70 images.

In this context, I will only mention a few.

This is a nuclear waste storage and encapsulation facility at the Hanford Site in Washington state, containing more than 1,900 submerged stainless steel capsules containing nuclear waste.

Anyone standing in front of an unprotected capsule will die instantly.

And in all this I found a section that actually resembles the outline of the United States of America. You can see it here.

And most of the missing work in this context is text.

So create these two poles.

All images are accompanied by very detailed factual text.

And what I am most interested in is the invisible space between the text and the image that accompanies it, and how the image is transformed by the text, and how the text is transformed by the image.

At best, therefore, images drift into abstraction and multiple truths and illusions.

And the text acts as a cruel anchor to nail you to the ground.

However, in this context, I prefer to read the condensed versions of these texts.

This is a cryopreservation unit that permanently houses the wives and mothers of cryopreservation pioneer Robert Ettinger. Ettinger hoped that one day he would wake up and be healthy and live longer with advances in science and technology, all at the cost of $35,000, which is stored forever.

This is a 21-year-old Palestinian woman undergoing hymenoplasty.

Hymenoplasty is a surgical procedure that restores the state of virginity, allowing her to comply with certain cultural expectations regarding virginity and marriage.

Essentially, it reconstructs a ruptured hymen and causes it to bleed during intercourse, simulating loss of virginity.

This is a simulated jury deliberation room, and beyond that double-sided mirror, you can see the jury counsel standing in the room beyond the mirror.

Also, by observing the deliberations after the moot court procedure, we can better advise our clients on how to adjust their trial strategy to get the outcome they want.

This process costs $60,000.

This is the US Customs and Border Protection Contraband Office at John F. Kennedy International Airport.

That table shows 48 hours worth of merchandise seized from passengers entering the United States.

I have a pig's head and an African giant rat.

Some of my photographic work is more than just documenting what is there.

I have some liberty to intervene.

In this piece, I wanted to resemble my early still life paintings, so I spent a lot of time on scents and items.

This is art on the wall of the CIA's former headquarters building in Langley, Virginia.

And the CIA has a long history of cultural diplomacy efforts, both covert and public.

And it is speculated that part of their interest in art was aimed at counteracting Soviet communism and promoting what they purported to be pro-American ideas and aesthetics.

And one of the art forms that has aroused the interest of the institution and has therefore been questioned is Abstract Expressionism.

This is a forensic anthropology research facility, with about 75 corpses on a 6-acre site at any one time, studied by forensic anthropologists and researchers interested in monitoring the rate of decomposition of corpses.

And in this particular photo, the boy's remains are used to recreate the crime scene.

It is the only federally funded location in the United States where cannabis cultivation for scientific research is legal.

Marijuana cultivation room for research crops.

And part of the research I want is that I can't find a recognizable formula for how these things are—that there is a kind of disorienting entropy that jumps awkwardly from government to science to religion to security—to fully understand how information is distributed.

These are transatlantic submarine communications cables that connect North America and Europe through the bottom of the Atlantic Ocean.

They carried over 60 million simultaneous voice conversations, and many government and technology sites had this very obvious vulnerability.

It's almost humorous, and I feel like the whole conversation could be cut out in one quick cut.

But it felt like it could have been filmed 30 or 40 years ago, trapped in the Cold War and not necessarily progressing.

This is the Braille edition of Playboy magazine.

(Laughter) And this is... A division of the Library of Congress is creating a free National Library Service for the blind, and the publications it publishes are selected based on readership popularity.

And Playboy is always in the top few.

(Laughter) But you'd be surprised, they didn't take pictures. it's just text.

(Laughter) This is the Avian Quarantine Facility, where all imported birds entering the United States are required to undergo a 30-day quarantine, where they are tested for diseases such as exotic Newcastle disease and bird flu.

The film shows testing the warhead with a new explosive charge.

And the Air Weapons Center at Eglin Air Force Base, Florida, is responsible for deploying and testing all weapons flown from the United States.

The film was shot on 72mm government-issued film.

And that red dot is a government-issued film marking.

All white tigers in North America are the result of selective inbreeding, mother-to-son, father-to-daughter, sister-to-brother, taking into account the genetic conditions that produce a marketable white tiger.

It means white fur, ice blue eyes and a pink nose.

And most of these white tigers are not born salable and end up being killed at birth.

This is a very violent process, but little is known about it.

And white tigers are obviously celebrated for various forms of entertainment.

Kenny was born. he's actually grown up.

Although he is dead, he is mentally retarded and suffers from severe bone abnormalities.

This is on a lighter note, but it's in George Lucas' personal archives.

This is the Death Star.

And here its true orientation is shown.

In the context of "Star Wars: Return of the Jedi," that mirror image is presented.

They invert the negative.

Then you can see the photo-etched brass details and the painted acrylic façade.

In the context of the film, this is the Galactic Empire's deep space battle base capable of destroying planets and civilizations, and is approximately 4 feet by 2 feet in actual size.

(Laughter) This is Fort Campbell, Kentucky.

This is the site of military operations in urbanized terrain.

Basically they are simulating a city for urban warfare and this is one of the structures present in that city.

It is called the World Church of God.

This should be a general place of worship.

And after I took this picture, they built a wall around the Church of the World God, mimicking mosque installations in Afghanistan and Iraq.

And I worked with Mehta Vihar, who creates virtual simulations for military tactical exercises.

And then we put that wall around the Church of the World and used the characters, vehicles, and explosions provided by the video game for military purposes.

And I photographed them.

This is the live HIV virus at Harvard Medical School, which is working with the US government to develop infertility immunity.

Alhura is also an Arabic-language television network supported by the US government, delivering news and information to more than 22 countries in the Arab world.

It runs 24 hours a day and is commercial free.

However, broadcasting Alfura in the United States is illegal.

And in 2004, they developed a channel called Alhoula Iraq. This channel specifically deals with events happening in Iraq and broadcasts to Iraq.

Now on to another project I did.

The title is "Innocent".

And for the men in these photographs, photography was used to create illusions.

Contrary to its function as proof of truth, in these cases it facilitated the fabrication of lies.

I have traveled across the United States photographing men and women who have been wrongfully convicted of crimes they didn't commit, violent crimes.

I explore photography's ability to obscure truth and fiction and its impact on memory that can lead to serious, even fatal, consequences.

The main cause of the wrongful convictions of the men pictured in these photos was an error in their identification documents.

Victims or witnesses use the imagery to help law enforcement identify the suspected perpetrator.

But exposure to synthetic sketches, Polaroids, headshots, and lineups can alter eyewitness accounts.

I will introduce one example from the case study.

A woman was raped and presented with a series of photographs to identify the perpetrator.

She found some similarities in one of the photos, but was unable to identify them definitively.

A few days later she was presented with another photo array containing all new photos. The difference, however, is that the second array repeats a single photo pulled slightly from the previous array.

And even if there was an actual memory, a positive identification is made because the picture has superseded the memory.

Photographs provided the criminal justice system with a tool to turn innocent citizens into criminals, but the system failed to recognize the limitations of its reliance on photo identification.

Frederick Day was photographed at his alibi location, and 13 witnesses tracked him down at the time of the crime.

He was convicted by an all-white jury of rape, kidnapping, and vehicle theft.

And he served ten years in prison for life.

Now, a DNA test has proven Frederick's innocence, and the involvement of another man in prison.

But the victim denied the charges, claiming law enforcement used Frederick's photo to permanently alter his memory.

Charles Fain was convicted of kidnapping, raping and murdering a girl on her way to school.

He was sentenced to death and served 18 years.

I photographed him at the crime scene in Snake River, Idaho.

And I photographed all those who were wrongfully convicted at some of the most significant places in the history of wrongful convictions.

Arrest scene, misidentification scene, location of alibi.

And here, at the crime scene, a place he had never been to, but that changed his life forever.

So while I was taking pictures there, I wanted to emphasize the tenuous relationship between truth and fiction, both in his life and in his photography.

Calvin Washington was convicted of death row murder.

He served 13 years in a life sentence in Waco, Texas.

Larry Mays, I took pictures at the arrest scene. There he hid between two mattresses to hide from the police in this very room in Gary, Indiana.

He would serve 18 and a half of his 80-year sentence for rape and robbery.

The victim was unable to identify Larry in two live lineups, but did so definitively from a photo array a few days later.

Larry Youngblood has served eight years of a 10-and-a-half-year prison sentence in Arizona for kidnapping and repeatedly sodomizing a 10-year-old boy at a carnival.

He is photographed at his alibi location.

Ron Williamson. Ron was convicted of the rape and murder of a bartender at a club and served an 11-year death sentence.

I took a picture of Ron at the ballpark because he was drafted by the Oakland Athletics to play professional baseball just before he was convicted.

And the key state witness in Ron's case turned out to be the actual perpetrator.

Ronald Jones was sentenced to death for the rape and murder of a 28-year-old woman and served eight years.

I photographed him at the scene of his arrest in Chicago.

William Gregory was convicted of rape and robbery.

He served seven of his 70-year sentence in Kentucky.

Timothy Durham was convicted of several counts of rape and robbery and sentenced to three-and-a-half years and 3,220 years in prison, although he was photographed at an alibi set up by 11 witnesses at the time of the crime.

He had been misidentified as an 11-year-old victim.

Troy Webb is photographed at a crime scene in Virginia.

He was convicted of rape, kidnapping and robbery and served seven of the 47 years in prison.

The photo of Troy was among the photo arrays the victim was tentatively attracted to, but said it looked too old.

Police went looking for a four-year-old photo of Troy Webb, and a few days later entered the photo archive, confirming his identity.

Well, I'm going to post a self-portrait.

And it shows repeatedly that distortions are always present and that our eyes are easily fooled.

that's it. thank you.

(applause)

Clearly, we are living in a moment of crisis.

Perhaps the financial markets are letting us down, the aid system is letting us down, but I still stand firm for the optimist who believes there has probably never been a more exciting moment in life.

That's because of some of the technologies we've been talking about.

That's because we're seeing an explosion of people around the world with the resources, the skills and, yes, the mindset to make a difference.

And there is a president who considers himself a global citizen. He recognizes that there is no longer a single superpower, but that we must engage with the world differently.

And by definition, all of you in this room must consider yourself a global soul, a global citizen.

you are on the front lines. And you've seen the best and worst things humans can do for and against each other.

And no matter what country you live or work in, you've also seen the amazing things individuals can do, even in the most mundane of conditions.

Today there is a heated debate about how best to lift people out of poverty, how best to free their energy.

On the other hand, some say the aid system is so broken that it needs to be abolished.

And on the other hand, there are those who say their problem needs more help.

And what I want to talk about is the complement of both systems.

We call it patient capital.

Critics point to $500 billion spent in Africa since 1970 and what more could there be than environmental destruction, unbelievable levels of poverty and rampant corruption.

They use Mobutu as a metaphor.

And their policy prescription is to make governments more accountable, focus on capital markets, invest, and give nothing.

On the other hand, as I said earlier, some people say the problem is more money.

When it comes to the rich, we help them out and give them a lot of money, but when it comes to our poorer brothers and sisters, we want very little to do with them.

They point to the eradication of smallpox and the distribution of tens of millions of malaria control nets and antiretroviral drugs as aid outcomes.

Both sides are correct.

And the problem is that neither side listens to the other.

Even worse, they themselves are not listening to the voices of the poor.

After 25 years of tackling the problems of poverty and innovation, it is true that there are probably no more market-oriented people on the planet than low-income people.

They have to navigate the market every day and make dozens and dozens of detailed decisions to survive in society, but a single devastating health problem affecting a family can set them back in poverty for generations.

So we need both markets and aid.

Patient Capital works in between, trying to get the best of both worlds.

It's money invested in entrepreneurs who know their communities and who see low-income people not as passive recipients of charity, but as individual customers, consumers, clients, people who want to make decisions in their lives, building solutions to healthcare, water, housing and alternative energy.

Persevering capital requires an incredible tolerance for risk, a long term in terms of giving entrepreneurs time to experiment, allowing the market to be used as the best wiretapping device we have, and an expectation of great social impact even at below-market returns.

Recognizing that markets have their limits, patient capital goes hand in hand with smart subsidies to extend the benefits of the global economy to all.

Well, entrepreneurs need patient capital for three reasons.

First, they tend to work in markets where people make $1, 2, 3 a day and make all decisions within that income level.

Second, the areas they work in have terrible infrastructure. Not to mention the lack of roads, sporadic power and high levels of corruption.

Third, they often create markets.

Even if it's the first time to introduce clean water to a rural village, it's something new.

And because so many low-income people have seen broken promises and massive amounts of bogus and sporadic drugs being offered, it takes a lot of time and patience to build trust.

It should also lead to a lot of administrative support.

It's about building systems and business models that can reach low-income groups in a sustainable way, but also connecting those businesses to other markets, governments and companies — building true partnerships if you want to scale.

I would like to share one story about an innovation called drip irrigation.

In 2002 I met an amazing entrepreneur from India named Amitabha Sadangi. He has worked with the poorest farmers on the planet for 20 years.

He expressed frustration that the aid market bypassed low-income farmers entirely, even though 200 million farmers in India alone earn less than $1 a day.

They were creating subsidies for large farms, or they were giving farmers what they thought they should use, not what they wanted to use.

At the same time, Amitabha was fascinated by this drip irrigation technology invented in Israel.

It was a method of bringing small amounts of water directly to the stem of the plant.

And it can turn desert lands into emerald green fields.

But all these systems were too expensive and were built for fields that were too large, and the market bypassed low-income farmers.

The average small village farmer works less than two acres.

So Amida decided to take that innovation and redesign it from the perspective of the poor farmers themselves. Because Amitabha spent so many years listening to what they needed instead of what they thought they should have.

And he used three basic principles.

The first is miniaturization.

The drip irrigation system had to be small enough that the farmer only had to risk four if two acres. Because it's just too scary when you think about everything you're putting yourself in danger.

Second, it had to be very affordable.

In other words, the risk of a quarter of an acre must be repaid in one harvest, otherwise it is not risked.

And third, it had to be infinitely expandable, as Amitabha called it.

What I mean is that the profit from the first quarter acre allows the farmer to buy the second, third and fourth acres.

As of today, Amitabha's organization, IDE India, has sold these systems to over 300,000 farmers and is seeing their yields and incomes double or triple on average, and this did not happen overnight.

In fact, going back to basics, no retail investor was willing to risk building new technology for the sub-$1 a day market segment in one of the riskiest sectors known as the most risk averse on the planet, agriculture.

So I needed a grant. And he used his large grants to research, experiment, fail, innovate, and try again.

And when we have a better understanding of how to prototype and sell to farmers, then the patient capital can come in.

And we helped him build a for-profit company that could consider selling and exporting based on his knowledge of IDE and leveraging other types of capital.

Then I wanted to see if this drip irrigation can be exported and brought to other countries.

There we met Dr. Sono Kangrani from Pakistan.

And again, it took patience to get the permits to transfer the technology for the poor from India to Pakistan, but over time I was able to set up a company with Dr. Sono, who runs a large community development organization in the Thar Desert, one of the most remote and poorest areas of the country.

And while that company is still in its infancy, our assumption is that it will affect millions there as well.

But drip irrigation is not the only innovation.

These things are starting to happen all over the world.

In Arusha, Tanzania, A to Z Textile Manufacturing teamed up with us, UNICEF and the Global Fund to set up a factory that currently employs 7,000 people, mostly women.

And we have produced 20 million lifesaving mosquito nets for Africans around the world.

LifeSpring Hospital, a joint venture between Acumen and the Government of India aimed at providing quality and affordable maternal care to low-income women, is so successful that it now builds a new hospital every 35 days.

And 1298 Ambulances decided to reinvent a completely collapsed industry and build an ambulance service in Bombay that uses Google Earth technology, a sliding scale fee system accessible to all, and a tough public decision not to engage in any kind of corruption.

As such, they were the first responders in the November terrorist attacks and are now beginning to scale thanks to partnerships.

The company has just won 4 government contracts to build 100 ambulances, making it one of India's largest and most effective ambulance companies.

This notion of scale is important.

Because we're starting to see that these companies are reaching hundreds of thousands of people. Everything I've discussed has reached at least 250,000 people.

But that alone is clearly not enough.

The concept of partnership is very important here.

Incredible opportunities for innovation exist, whether by finding innovations that have access to capital markets, governments themselves, or partnerships with large corporations.

President Obama understands that too.

He recently endorsed the creation of the Social Innovation Fund to focus on what is working in the country and how it can be scaled up.

And I would suggest that it is time to consider a global innovation fund that finds entrepreneurs around the world who really have innovations that can be leveraged not just for their own countries but also in the developed world.

We invest not only financial assistance but also management assistance.

And we measure returns from both a financial perspective and a social impact perspective.

When we think of new approaches to aid, we can't help but talk about Pakistan.

Relations with this country have been volatile, and in all fairness the United States has not always been a reliable partner.

But again, I would say that now is the moment for extraordinary things to happen.

And if we adopt the concept of a global innovation fund, we could use this time to invest in the many established entrepreneurs and civil society leaders who are already building great innovations that reach people across the country, rather than investing directly in governments and international experts, even with the blessing of governments.

People like Rashani Zafar have set up one of the country's largest microfinance banks and are a true role model for women at home and abroad.

And Tasneem Siddiqui developed a method called incremental housing, moving 40,000 slum dwellers into safe and affordable community housing.

Educational initiatives such as DIL and citizen foundations that are building schools across the country.

It is no exaggeration to say that these civil society institutions and social entrepreneurs are building a real alternative to the Taliban.

I have been investing in Pakistan for over 7 years and anyone who has worked in Pakistan can attest to the fact that Pakistanis are an incredibly hard working people with an inherently fierce upward desire.

President Kennedy said that those who make peaceful revolution impossible make violent revolution inevitable.

The reverse is also true.

That these social leaders who are serious about innovation and opening opportunities to the 70 percent of Pakistanis who earn less than $2 a day offer a real path to hope.

And as we think about how to build aid to Pakistan, we need to strengthen justice and build greater stability, while also thinking about raising leaders who can serve as role models for the rest of the world.

During my last visit to Pakistan, I asked Dr. Sono if he would take me to see some of the drip irrigation in the Thar Desert.

And we left Karachi one morning before dawn.

It was around 115 degrees.

And we drove eight hours along this lunar landscape, with so little color, so much heat, so exhausted, that there was little discussion.

And finally, at the end of my journey, I saw this thin little yellow line over the horizon.

And as we got closer, its significance became clear.

There was a field of sunflowers seven feet high in the desert.

Because one of the poorest farmers on the planet had access to technology that would allow them to change their lives.

His name was Rajah, and he had soft, glowing hazel eyes and warm, expressive hands that reminded him of his father.

And he said it was the first dry season in his life when he didn't take his 12 children and 50 grandchildren on a two-day journey across the desert as a day laborer at about 50 cents a day on a commercial farm.

because he was growing these crops.

And the money he earned allowed him to stay this year.

And for the first time in three generations, his children are going to school.

We asked him if he would send not only his sons but also his daughters.

And he said, "Of course I will.

Because I don't want to be discriminated against anymore. ”

The basic dignity of the individual cannot be denied when considering solutions to poverty.

After all, dignity is more important to the human spirit than wealth.

And it's interesting to see entrepreneurs in different fields building innovation, recognizing that what people want is freedom and choice and opportunity.

Because that is where true dignity begins.

Reverend Martin Luther King said that love without power is anemic and sentimental, and power without love is reckless and abusive.

Our generation has seen both approaches tried and often unsuccessfully.

But I think our generation may also be the first to have the courage to embrace both love and power.

Because it is what we need to dream and move forward to imagine what it really takes to build a global economy that includes all of us, and ultimately expand on the basic proposition that all humans are created equal to all humans on earth.

Now is the time for us to start innovating and exploring new solutions across sectors.

I can only speak from my own experience, but in my eight years running Acumen Fund, I have witnessed the power of patient capital.

Not only to stimulate innovation and risk-taking, but to truly build a system that will create more than 25,000 jobs and provide tens of millions of services and products to the poorest people on the planet.

I know it works.

But I know many other kinds of innovation work too.

So, no matter what field you work in or what kind of work you do, I encourage you to start thinking about how you can build a solution, starting from the perspective of the people we're trying to help.

rather than what we think they need.

You need to hold the world in your arms.

And that requires living with a spirit of generosity and responsibility, integrity and perseverance.

But these are precisely the qualities that men and women have admired for generations.

And there are many things we can do.

Think of sunflowers growing in the desert.

thank you.

(applause)

Steroids: notorious for their use in sports.

But they are also found in inhalers, creams to treat poison ivy and eczema, and injections to relieve inflammation.

The steroids in these drugs are different from those used to build muscle.

In fact, they're all based on yet another steroid that our bodies produce naturally and we can't live without.

Taking a step back, the reason there are so many types of steroids is that the term refers to substances with a common molecular structure rather than a common effect on the body.

Steroids can be natural or synthetic, but what all steroids have in common is a molecular structure consisting of a base of four rings of 17 carbon atoms arranged in three hexagons and one pentagon.

This exact arrangement must be included for a molecule to be a steroid, but most molecules also have side chains, additional atoms that can dramatically affect the function of the molecule.

The steroid name is derived from the fatty molecule cholesterol.

In fact, our body makes steroids from cholesterol.

This fatty cholesterol base means that the steroid can cross the fat cell membrane and enter the cell.

Within cells, it can directly affect gene expression and protein synthesis.

This is unlike many other types of signaling molecules that cannot cross the cell membrane and must produce their effects from outside the cell via more complex pathways.

Therefore, steroids can produce effects faster than other molecules.

Let's go back to the anti-inflammatory steroids. All of these are based on a naturally occurring steroid called cortisol.

Cortisol is the body's primary stress signal and has a very wide range of functions.

When we experience a stressor (like a fight with a friend, spotting a bear, an infection or low blood sugar), our brain responds by sending a signal from the hypothalamus to the pituitary gland.

The pituitary then signals the adrenal glands.

The adrenal glands produce cortisol and continuously release some of it.

However, when a signal is received from the pituitary gland, a burst of cortisol is released, causing the body to produce more glucose for energy, reducing non-survival functions such as digestion, and possibly activating the fight-or-flight-freeze response.

This works in the short term, but if it lasts too long it can cause unwanted side effects such as insomnia and depressed mood.

Cortisol also interacts with the immune system in complex ways and can increase or decrease certain immune functions depending on the circumstances.

In the process of fighting infection, the immune system often causes inflammation.

Cortisol suppresses the immune system's ability to cause inflammation, which is also helpful in the short term.

However, excess cortisol can have adverse effects, such as reducing the immune system's ability to regenerate bone marrow and lymph nodes.

To prevent levels from getting too high, cortisol suppresses signals that cause the adrenal glands to release more cortisol.

Medicinal corticosteroids modulate cortisol's effects on the immune system to fight allergic reactions, rashes, and asthma.

All of these are forms of inflammation.

There are many synthetic steroids that share the same basic mechanism. They boost the body's supply of cortisol and block excessive immune responses that cause inflammation.

These corticosteroids can enter cells and turn off "fire alarms" by suppressing gene expression of inflammatory signals.

Steroids in inhalers and creams only affect the affected organs, namely the skin and lungs.

Intravenous or oral versions are used to treat chronic autoimmune diseases such as lupus and inflammatory bowel disease, which affect the whole body.

When this happens, the body's immune system attacks its own cells. This is a process similar to continuous asthma attacks and rashes.

Continuous administration of low-dose steroids can help control the immune response in this rebel, but high doses are reserved for emergencies and flare-ups due to the adverse psychological and physiological effects of long-term exposure.

Asthma attacks, poison ivy boils, and irritable bowel syndrome may seem totally unrelated, but they all have one thing in common. It is the immune response that does more harm than good.

Corticosteroids don't give you huge muscles, but they are the body's best defense against itself.

Do we live in a world without borders?

Before answering that, take a look at this map.

According to modern political maps, there are over 200 countries in the world today.

Perhaps more than at any time in recent centuries.

Now, many of you will disagree.

For you, this would be a better map.

You can call it TEDistan.

TEDistan has no borders, just connected and disconnected spaces.

Most of you probably live in one of the 40 dots on this screen, and one of the others representing 90 percent of the global economy.

But let's talk about 90 percent of the world's population who never leave where they were born.

For them, nations, nations, borders, borders are still of great importance and often violent.

Right now, here at TED, we're solving some of the great mysteries of science and the mysteries of the universe.

Well, here's the underlying problem we haven't solved. That's our basic political geography.

How can it be distributed around the world?

This is important because border disputes legitimize much of the world's military-industrial complex.

Border disputes could derail much of the progress we hope to make here.

Therefore, I believe that changing the world map requires a deeper understanding of how people, money, power, religion, culture, and technology interact.

And we can anticipate those changes and try to shape them in a more constructive way.

So, to get an idea of ​​where things are going, let's take a look at some past, present, and never-before-seen maps.

Let's start with the world of 1945.

In 1945 there were only 100 countries in the world.

After World War II, Europe was devastated, but still retained large overseas colonies, including French West Africa, British East Africa, and South Asia.

Then came a wave of decolonization in the late 40's, 50's, 60's, 70's and 80's.

Over 50 new nations were born.

You can see that Africa is fragmented.

India, Pakistan, Bangladesh and Southeast Asian countries were created.

Then the Cold War ended.

The end of the Cold War and the collapse of the Soviet Union.

It created new states in Eastern Europe, the former Yugoslav Republic and the Balkans, and in Stans in Central Asia.

There are currently 200 countries in the world.

The entire globe is covered by sovereign and independent nation-states.

Does that mean someone's gain must be someone else's loss?

Let's zoom in on one of the world's most strategic regions: Eastern Eurasia.

As you can see on this map, Russia is still the largest country in the world.

And as you know, China is the most populous country.

And they share a long land border.

What this map doesn't show is that most of Russia's 150 million people are concentrated in the western states and regions closer to Europe.

And only 30 million people live in the eastern region.

In fact, the World Bank predicts that Russia's population is declining towards about 120 million people. And there's one more thing that this map doesn't show.

Stalin, Khrushchev, and other Soviet leaders drove Russians to the Far East and imprisoned them in forced labor camps, labor camps, and nuclear cities.

But as oil prices have risen, the Russian government has invested in infrastructure to unify the country east and west.

But nothing has had such a negative impact on Russia's population distribution. People from the East who didn't want to stay there took trains and roads back to the West.

As a result, the Russian Far East, which is twice the size of India, is home to just 6 million Russians.

So let's try to understand what is happening in this part of the world.

Let's start with what we call Mongolia, or Minegoria.

Why is it called that?

This is because Chinese companies operate and own most of the copper, zinc and gold mines in Minegoria, trucking the resources south and east into mainland China.

China did not conquer Mongolia.

I am buying that.

The colony was once conquered. Countries are being bought today.

Now let's apply this principle to Siberia.

When most people think of Siberia, they probably think of cold, desolate and uninhabitable places.

But in reality, global warming and rising temperatures have suddenly spawned vast wheat fields and agribusiness, producing grain in Siberia.

But who does it feed?

Well, across the Amo River, China's Heilongjiang and Harbin provinces have over 100 million people.

This is more than the entire population of Russia.

Each year, for at least a decade, 60,000 of them vote on their feet, cross, migrate north, and live in this bleak landscape.

They set up their own bazaars and clinics.

They have hijacked the timber industry and are shipping timber east and back to China.

Again, like the Mongols, China has not conquered Russia. It's just borrowing.

That is what I call Chinese-style globalization.

Perhaps this is what the map of this area will look like in 10 to 20 years.

but please wait a moment. This map is 700 years old.

This is a map of the Yuan Dynasty, led by Genghis Khan's grandson, Kublai Khan.

So history doesn't necessarily repeat itself, but it does rhyme.

This is for you to experience what is happening in this part of the world.

Globalization Chinese style.

Because globalization opens up all sorts of ways for us to undermine and change the way we think about political geography.

So if you look at the history of East Asia, people actually don't think about nations and borders.

They think in terms of empires and hierarchies, usually Chinese or Japanese.

Now it's China's turn again.

So let's see how China is restructuring its hierarchy in the Far East.

It starts with the global hub.

Remember the 40 dots on the night map that mark the center of the world economy?

East Asia today has more global hubs than any other region in the world.

Tokyo, Seoul, Beijing, Shanghai, Hong Kong, Singapore, Sydney.

These are global capital filters and funnels.

Trillions of dollars flow into the region annually, much of it invested in China.

Then there is trade.

These vectors and arrows represent stronger-than-ever trade ties between China and all countries in the region.

Specifically, it targets America's strong allies Japan, South Korea, and Australia.

Australia, for example, relies heavily on iron ore and natural gas exports to China.

For poorer countries, China will lower tariffs, allowing Laos and Cambodia to sell their goods cheaper and similarly rely on exports to China.

And now, many of you are probably reading in the news about people's expectations for China, which will lead the economic recovery, not just for Asia, but potentially for the world as well.

The trade volume of the emerging Asian free trade zone, or near-free trade zone, is greater than that of the entire Pacific Ocean.

As such, China is becoming an economic anchor in the region.

Another pillar of this strategy is diplomacy.

China has military agreements with many countries in the region.

It is the center of diplomatic institutions such as the East Asian Community.

Some of these organizations are not affiliated with the United States.

There are non-aggression pacts between nations, and if a conflict erupts between China and the United States, most nations, including America's allies such as South Korea and Australia, have promised to stand by and watch the conflict.

As in Russia, another pillar of the strategy is demographics.

China exports businessmen, nannies, students and teachers to teach Chinese within the region, international marriages, and an even bigger share of the economy.

Already the Chinese in Malaysia, Thailand and Indonesia are a real key factor and driving force in their economies.

As a result, there is a resurgence of Chinese pride in the region.

Singapore, for example, once banned Chinese language education.

It is now encouraged.

What do you get when you add it all up?

Now, if you remember before World War II, Japan had a vision of a larger Japanese co-prosperity sphere.

What is emerging today is a larger co-prosperity sphere of China, so to speak.

So, regardless of what the lines on the map show in terms of nations and borders, what really emerges in the Far East is national culture, albeit in a more fluid imperial zone.

All this is happening without firing a shot.

This is arguably not the case in the Middle East, where countries are still deeply offended by the borders left by European colonialists.

So how can we think differently about borders in this part of the world?

Which line on the map should I focus on?

What I want to introduce you to is what I call daily nation building.

Let's start with Iraq.

Six years after the US invasion of Iraq, the country is still more often on the map than it is.

Oil was once one of the forces that held Iraq together. It is now the number one cause of the collapse of the country.

The reason is Kurdistan.

After 3,000 years of struggle for independence, the Kurds finally have a chance to do so.

These are pipeline routes coming out of Kurdistan, an oil-rich region.

And if you go to Kurdistan today, you will see Kurdish Peshmerga guerrillas confronting Sunni Iraqi forces.

But what are they protecting?

Is it really a border on the map?

No, it's a pipeline.

If the Kurds can control the pipeline, they can set the conditions for their national entitlement.

Now, should we be upset about this, the possibility of Iraq collapsing?

I don't think it should.

Iraq will continue to be the second largest oil producer in the world after Saudi Arabia.

And we will have a chance to settle a 3,000-year-old conflict.

Now remember that Kurdistan is a landlocked country.

There is no choice but to act.

To profit from oil, it must be exported through Turkey, Syria, other countries, and Iraq itself.

Therefore, it is necessary to establish friendly relations with them.

Now let's take a look at the ongoing conflicts in the region.

That is, of course, in Palestine.

Palestine is like an anomaly on the map, because two parts are Palestine and one part is Israel.

Thirty years of rose garden diplomacy have not brought us peace in this conflict.

What can you think of? I believe that infrastructure can solve this problem.

Donors are currently spending billions on this.

These two arrows are the commuter rail and other infrastructure arcs connecting the West Bank and Gaza.

A Palestinian state and Palestinian economy can survive if Gaza has a functioning port and is connected to the West Bank.

I believe it will bring peace to this particular conflict.

The lesson from Kurdistan and Palestine is that independence alone is useless without infrastructure.

Now, what might this whole region look like if we really focused on other lines on the map besides the borders, in a potentially alluring way?

The last time something like that happened was actually a century ago during the Ottoman Empire.

This is the Hijaz Railway.

The Hijaz Railway ran from Istanbul to Medina via Damascus.

There was also a branch line to modern-day Israel, Haifa facing the Mediterranean Sea.

Today, however, the Hijaz Railway is in tattered ruins.

I believe the Middle East would be a much more peaceful region if we focused on recreating the straight lines and curves on the infrastructure across borders on the map.

Now let's look at another part of the world, the former Soviet republics of Central Asia, "Stan".

The borders of these countries derive from Stalin's decrees.

He purposely did not want these countries to make sense.

He wanted the peoples to mix in such a way that they could divide and rule.

Fortunately for them, most of the oil and gas resources were discovered after the collapse of the Soviet Union.

Now, some of you may be thinking, "Oil, oil, oil."

Why is he talking so much about oil? ”

Well, there's a big difference between how we used to talk about oil and how we talk about it now.

Previously, how would one manage their oil?

Now it's oil for their own purposes.

And I assure you it is as important to them as it was to the colonialists and imperialists.

Here are just a few of the pipeline projections and possibilities, scenarios and routes planned for the next few decades.

We have a lot.

For many countries in this part of the world, having a pipeline is their ticket to becoming part of the global economy, to having something to do with borders that are not loyal to their own country.

Take Azerbaijan.

Azerbaijan was a forgotten corner of the caucuses, but the Baku-Tbilisi-Ceyhan pipeline to Turkey has rebranded it as a Western frontier.

Next is Turkmenistan, which most people think of as a refrigerated basket case.

But now it could supply gas to Europe across the Caspian Sea and even supply the Turkmen-Afghanistan-Pakistan-India pipeline.

Then there is Kazakhstan, which until now didn't even have a name.

In Soviet times it was considered Southern Siberia.

Today, most people perceive Kazakhstan as an emerging geopolitical player. why?

It's shrewdly designing pipelines that cross the Caspian Sea, north through Russia, and east to China.

More pipeline means more Silk Road, not Great Game.

The Great Game implies that one dominates the other.

Silk Road means independence and mutual trust.

More pipelines, more Silk Roads, and fewer Great Game Contests will dominate in the 21st century.

So let's take a look at the only region of the world that has actually abolished its borders and how it has strengthened its power.

And it is of course Europe.

The European Union started as a coal and steel community of six countries. Its main purpose was, in fact, to continue the peaceful realization of German reconstruction.

But it eventually grew to 12 countries, which are the 12 stars on European flags.

It also became an EU currency bloc and is now the strongest trading bloc in the whole world.

On average, the EU has grown by one country each year since the end of the Cold War.

In fact, most of it happened in just one day.

In 2004, 15 new countries joined the EU.

And now most are building peace zones of 450 million people in 27 countries.

So what's next? What is the future of the European Union?

Light blue indicates zones or regions that are at least two-thirds dependent on the European Union for trade and investment.

What does it tell us? Trade and investment tell us that Europe is pouring money into lip service.

Even if these regions are not part of the EU, they are becoming part of its sphere of influence.

take over the Balkans. Croatia, Serbia, Bosnia, they are not EU member states. not yet.

However, you can almost reach Albania by taking a German ICE train.

Bosnia already uses the Euro currency and it is probably the only currency they will have going forward.

So let's look at other parts of Europe's periphery, such as North Africa.

On average, every one to two years, a new oil or gas pipeline opens under the Mediterranean Sea, linking North Africa with Europe.

Not only will this help Europe reduce its dependence on Russia for energy, but if you travel through North Africa today, you will hear more and more people who don't really think of their region as the Middle East.

In short, I believe that French President Nicolas Sarkozy is right to talk about the Union for the Mediterranean.

Now let's look at Türkiye and the Caucasus.

I have mentioned Azerbaijan before.

This corridor connecting Turkey and the Caucasus is a conduit for 20 percent of Europe's energy supply.

So should Turkey really be a member of the European Union?

I'm afraid not. I think it has already become part of the Euro-Turkish superpower.

So what's next? Where will borders change and new nations will be born?

Well, South Central Asia, South West Asia are very good starting points.

Eight years after the U.S. invaded Afghanistan, the situation remains very precarious.

Pakistan and Afghanistan remain very fragile, neither constructively addressing the issue of Pashtun nationalism.

This is the flag that floats in the minds of the 20 million Pashtuns who live on both sides of the Afghanistan-Pakistan border.

Let's not ignore the Balochistan rebellion just to the south. Two weeks ago, Baloch rebels attacked a Pakistani military post, and this was the flag they flew over that post.

The post-colonial entropy happening around the world is accelerating, and I expect more such changes to the map as nations split.

Of course, let's not forget Africa.

53 countries, with the most questionable straight lines on the map.

If you look at Africa as a whole, you will no doubt recognize that there are far more divisions, such as tribes.

But let's look at Sudan, the second largest country in Africa.

As you all know, there are three civil wars going on: the Darfur genocide, the Eastern and South Sudan civil wars.

South Sudan will hold a referendum in 2011 and is very likely to vote for independence.

Now let's go to the Arctic.

There is fierce competition for energy resources on the Arctic seafloor.

who will win? Canada? Russia? usa?

Actually Greenland.

A few weeks ago, [60,000] people in Greenland voted for autonomy from Denmark.

So Denmark is about to get even smaller.

What is the lesson to be learned from all this?

Geopolitics is a very unemotional subject.

Just like climate change, the world is constantly changing and changing.

And just like our relationship with ecosystems, we are constantly searching for balance in how we divide ourselves on the planet.

Now we fear change on the map.

We fear civil wars, death tolls and having to remember the names of new countries.

But I believe the existing border inertia we have today is far worse and far more violent.

The question is, how do you change that boundary and what boundary do you focus on?

I think we are focused on cross-border lines, infrastructure lines.

Then we will have the world we want: a world without borders.

thank you.

(applause)

Hi! Hi!

I am 45 years old.

I know I'm great, thank you. (Laughs) I'm 45 years old, but I've never unconsciously held hands with my lover in public.

I'm 45 and have never casually, comfortably, carelessly held hands with my partner in public.

I don't know how many people can imagine what that would be like. Of course, holding hands with your lover in public is a small thing, isn't it?

It's not that nobody wanted it, it's just that we weren't comfortable.

Now, like many gay people, there was a time in my youth when I struggled against being gay.

I didn't want to be different.

I didn't want it to be something I didn't really understand.

This I learned was something to be ashamed of, or worthy of a joke.

But when I finally came to understand and accept who I am, I never once wished it had turned out differently since that moment.

I am thoroughly, deeply, glad and happy to be gay.

(Applause) It suits you! (Laughs) I'm really good at it! (Laughter.) Still, I am jealous of heterosexual people every day. Because that private, tiny, tiny, intimate gesture of affection has never been mine.

Every day I see young heterosexual couples casually holding hands walking in the park, and I envy them.

I saw a teenage couple at the bus stop. She is leaning over him, placing her hands inside him and tucking her hands into his jacket pockets for warmth. I envy that teenage couple.

Sometimes I see men unconsciously putting their arms around her to protect her hands while she intertwines her fingers into themselves, and I envy that.

Maybe you're on Grafton Street and an elderly woman gestures to get her husband's attention to something in the window. And without a second thought my husband just takes her hand and they are standing there looking out the window discussing what caught their attention and their hands just haphazardly clasped and I envy that!

Because homosexuals cannot hold hands in public without first considering the risks.

Gay people can't put their arm through another or put their hand on their boyfriend's waist without first considering what the possible consequences might be.

We look around and wonder where we are, who is around us, is it late at night? What kind of area is it?

Do you have a bored teenager hanging around looking for entertainment?

A crowd of young people standing outside the pub?

So if we decide OK, maybe okay, okay, we'll hold hands then, but the problem is, those hands aren't casual and thoughtful now.

They are currently being considered and weighed.

But we, like everyone else, walk hand in hand to try to be normal and carefree, but it really isn't.

Because it always scans the sidewalk ahead, just in case.

And even if we see a group of men coming towards us, perhaps we will decide to hold hands defiantly, in some kind of silence!

But now, small intimate acts between two people in love are no longer small intimate acts.

It was an act of political treason and it was screwed up.

And anyway, you think: "Oh, I had such a lovely afternoon hanging out at the garden center looking for something that wasn't actually in the garden."

(Laughter) And you think that a single “fuck” spit or a split lip can turn that really nice afternoon into a nasty afternoon you never want to remember.

Even if you're in a place where you think, "Oh, I'm totally fine here."

No one here is going to react badly to our little gestures. ”

Well, I don't know, but let's say you're wandering through a high-end department store.

People will still notice.

Now they may only be aware because they think, "Wouldn't it be lovely to see two gay people holding hands in public?"

But they still notice, and I don't want them to notice, because our little, intimate, private, small, human gestures turn into statements, and I don't want that!

Like Schrödinger's cat, our small, private behavior changes just by being observed.

We live in such a homophobic world that small things like holding hands in public might make you think, "Well, it's just a small thing," and you're right.

It's certainly a small thing.

But it's one of the many little things that make us human, and there are many little things every day that LGBT people have to put up with that others don't.

There are many small things we have to put up with in order to stay safe or not be ridiculed or disrespected.

And we are called upon to put up with those things and just be grateful that we are not living in a country where we can be imprisoned or executed for being gay.

And we're so used to making these small tweaks every day that we rarely even notice that we're making them. Because it is just part of the background of our lives.

This constant malevolent presence we have assimilated, and when we complain about it, we are told we have nothing to complain about because “Aren’t you lucky you don’t live in Uganda?”

Yes, I'm lucky I don't live in Uganda, but that's not enough.

This is not some kind of game or competition where those who get the worst get the right to complain and others just have to put up or shut up.

Our society is homophobic!

Homophobia is pervasive.

Homophobia is overflowing.

And when you're 45 and you've been putting up with it for 30 years, absorbing all those little scorns, threats, cynicism, and sometimes worse, you just get sick of it.

Tired of being patient.

I am tired of reading articles by yet another straight man explaining why I am inferior to others.

You're tired of hearing people talk about you as disabled or who don't even know you from the single's pulpit.

I'm tired of the scribbled graffiti, and I'm tired of people cynically describing things as gay.

I'm sick of strutting past drunks on Saturday nights, and I'm sick of people spending their time, energy and talents campaigning against you being treated like any other nation.

(Applause.) I'm 45 and I'm tired of being patient.

Of course, if no one is hostile towards gays or uncomfortable with gay relationships, I hope so, but you know, I can live with a little personal, private homophobia that some people might have.

For example, I can live with Mary in Wicklow. Sometimes Mary turns on the TV and sees Graham Norton and thinks, "Oh, he looks good enough, but does he need to be so gay?"

(laughter) I can live with that.

You can live with Mary, who doesn't know anyone who's gay, except for that guy who gets his hair done once a month at Curl Up and Dye.

(Laughter.) Mary comes solely from the knowledge she gleaned from schoolyards, churches, and Coronation Street about our relationships with gay people.

I can live with that.

I would love to sit on the couch and watch Coronation Street with Mary.

I would be happy to have a cup of tea with her and discuss why she feels a little uncomfortable with gay relationships and hope that Mary will change her mind.

I hope she meets more gay people and soon realizes that we are just as normal, as kind, or as annoying as all of you.

And I hope she changes her mind for herself as well as others. Gay people can bring good into Mary's life just like anyone else.

And of course we can also help her with her decorations.

(Laughter.) But that kind of personal displeasure with gay people and their relationships is very different from the kind of homophobia that manifests in public.

A form of homophobia that manifests itself as an attempt to make LGBT people treated differently or less than others.

A form of homophobia that seeks to characterize homosexuals and their relationships as unworthy of respect.

I have a problem with that kind of homophobia. I think gay people should be allowed to shout it when they see it. Because it is our right to do so.

Of course, there are many who object to the term homophobia itself.

They are against the "phobia" part.

“I am not afraid of you,” they say.

(Laughter) But I'm not saying that every time a homophobe walks past a Cher album, they cower in horror (Laughter), but they're scared.

They fear what might happen in a world that treats gay, lesbian, and bisexual people with the same respect as other people.

They fear that they will not fit into this wonderful new world of equality.

But of course, their fear is irrational, because nothing in the world changes.

Kids will still want ice cream, dogs will still fetch and play, the tide will still come in, parallel parking will still be difficult.

(Laughter.) The most vocal homophobes know they long ago lost the debate over the decriminalization of homosexual sex and all the progress that has been made for homosexuals.

These days, you can find very vocal homophobes crowding around the same-sex marriage debate, and it's pretty spectacular. Because, of course, they know they can't come out right away and be candid about what's driving them. It's a hostility to homosexuals and a disgust for what they imagine us doing in bed. Because they know it can no longer resonate with the general public.

So they are forced to sort of scramble for any other reason they can think of to make their point.

So gay people will destroy the institution of marriage, and gay couples will wander through orphanages picking babies off shelves trying to find the right fit for their new Ikea sofa.

(Laughter) Or the old argument that allowing gay marriage would destroy society itself, and many things, including my own personal favorites. One dictionary defines the word "marriage" as the union of a man and a woman, and therefore same-sex marriage cannot be "marriage".

This is an arcane argument against language and dictionaries, not against same-sex marriage.

(Applause.) Now, of course, the other real factor in homophobia is, I'm going here, so grab your pearls here. It's an aversion to gay sex, especially gay male sex.

Poor old lesbians just get caught in a barrage of homophobia. (Laughter.) You know guilty by association.

Because what they really hate is anal sex, sodomy and, you know, Bagley, and they assume that's all we do.

They fanatically imagine us spending all day annoying each other flying around.

I mean, they're obsessed with it, and in fact what they're really doing is reducing us to this one sexual act whether we do it or not. Because we are not just normal human beings with the same hopes, aspirations, ambitions and feelings as everyone else, we are just walking through the act of love.

Earlier this year, I was invited to attend the St. Patts for All parade in Queens, New York.

Now the event has become a really cool and engaging grassroots event in Queens, founded in response to a ban on gay groups marching in Manhattan's famous St. Patrick's Day Parade.

In that Manhattan St. Patrick's Day parade, any Irish group that wishes can march, so can Irish police officers, Irish firefighters, Irish soccer players, Irish community groups, Irish volleyball teams, and Irish book clubs.

Any Irishman who wants to have a chance of being allowed to march on the parade - except for Irish gays, because to the parade organizers, gays are just walking sex, and there is no room for eavesdropping on their parades.

Well, I actually saw a little documentary about one of the leaders of that parade organizer, and they were an ancient Hibernian order, kind of like the Catholic Order of Orange (laughter) - they wore the same clothes and everything - (laughter).

And when I looked at them, I knew that this life was lived together. I imagined that if I asked him about their life together, he would remember the first time they met, how nervous they were on their first date, and how proud he was when he turned around and saw her coming up the aisle in the dress she had long brooded over.

And if I ask him, he'll remember the phone call that she was in labor and sprinting across town, and the promise of jumping on the trampoline until the baby popped when she was well past her due date, and how we both laughed about it.

And I think he will remember when his youngest broke his arm and went to the hospital crying all the time, and waking up in the middle of the night to go back to the hospital even though she was too sick to sleep alone in an empty bed and he knew he wouldn't be able to see her at that time.

I imagine he would remember all of them and many more.

All the little things that build relationships and make people human.

And when I saw him, I imagined all those things too.

But when he looks at me, he doesn't look at me that way.

He doesn't see homosexuals that way.

To him we are just sex acts, and there is no room for sex acts in his parade.

I'm 45 and I'm tired of putting up with it.

So I am no more.

I'm 45 and I don't have the energy anymore so I don't hold back anymore.

I'm tired of being patient!

I'm 45 and I can't take it anymore.

Forty-five! I was born six months before the Stonewall riots. And it took you 45 years to realize that, despite my appearance, I'm just as ordinary, unremarkable, and human as you are.

I'm 45 and I don't ask anymore. I am only human!

Thank you for your time!

(Applause.) Thank you! thank you!

(applause)

This morning I want to talk a little bit about what happens when you move from design to design thinking.

Now, this pretty old photo up there is actually the first project I worked on when I was hired, about 25 years ago.

This is a woodworking machine, or at least part of it, and my challenge was to make it a little more modern and a little easier to use.

At that time, I thought I did a good job.

Unfortunately, the company went out of business shortly after that.

This is the second project I have done. It's a fax machine.

I put a fascinating shell on some new technology.

Again, after 18 months, this product has been discontinued.

And now, of course, the whole technology is obsolete.

Okay, I'm a pretty slow learner, but in the end it hit me that what passes for a design might not matter all that much. That means making things more attractive, making them a little easier to use, and making them more marketable.

By focusing on design, perhaps a single product, I was progressive and never made a big impact.

But I think this small view of design is a relatively recent phenomenon and really took off in earnest in the late 20th century when design became a tool of consumerism.

So when we talk about design today, especially when we read about it in the general press, we are often talking about products like this.

interesting? yes. desirable? perhaps.

important? Not much.

However, this was not always the case.

And what I would suggest is that if you look at design differently, focusing on design thinking as an approach rather than an object, you might actually get more impactful results.

Now, this gentleman, Isambard Kingdom Brunel, designed many great things during his 19th century career, including the Clifton Suspension Bridge in Bristol and the Thames Tunnel at Rotherhithe.

Both are great designs and actually quite innovative as well.

His best work really runs right here in Oxford.

It's called the Great Western Railway.

As a child, I grew up very close to here. And one of my favorite pastimes was biking alongside the tracks while waiting for the big express train to roar past.

You can see it expressed in J.M.W. here. Turner's painting "Rain, Steam, and Speed".

Now, what Mr. Brunel said he wanted his passengers to experience was a floating experience through the countryside.

Well, this goes back to the 19th century.

And to do that, they had to create the flattest slopes ever built, and build long viaducts across the river valley (actually the Thames viaduct at Maidenhead) and long tunnels like the one at Box, Wiltshire.

But he didn't stop there. He didn't stop at trying to design the best rail journeys.

He envisioned an integrated transportation system where passengers could board trains in London and disembark ships in New York.

One trip from London to New York.

This is the S.S. Great Western he built for the second half of his journey.

Well, I think Brunel worked 100 years before the design profession emerged, using design thinking to solve problems and create world-changing innovations.

Well, design thinking starts with what University of Toronto Business School professor Roger Martin calls “integrative thinking.”

And it is the ability to use conflicting ideas and conflicting constraints to come up with new solutions.

For design, it means balancing the desirability of human needs with technical and economic feasibility.

Innovations like the Great Western allow us to stretch that balance to the limit.

So somehow we got from here to here.

From system thinkers who were reinventing the world, to clerics working small jobs in black turtlenecks and designer glasses.

As industrial society matured, design became a profession, focused on smaller and smaller canvases to express aesthetics, image and fashion.

Now I'm not going to throw stones here.

I am a full paid member of that priesthood and have my designer glasses somewhere here.

Let's go.

But I think the design is probably going big again.

And it does so by applying design thinking to new kinds of problems such as global warming, education, healthcare, security, and clean water.

And as we see Design Thinking re-emerge and start tackling new kinds of problems, I think we can observe some useful basic ideas.

I would like to talk about some of them in the next few minutes.

The first is that design is human-centric.

It may integrate technology and economics, but it starts with what humans need or might need.

What makes life easier and more enjoyable?

What makes technology useful and easy to use?

But it's more than just good ergonomics with well-placed buttons.

Understanding the culture and context is often important before you know where to start thinking about ideas.

So when the team was working on a new vision screening program in India, they wanted to understand what their aspirations and motivations were in order to understand what role these schoolchildren could play in parental screening.

Conversion Sound has developed high quality, ultra-low cost digital hearing aids for developing countries.

In the West today, these hearing aids are fitted by highly trained technicians.

In places like India, such technicians simply do not exist.

So the team working with patients and local healthcare professionals in India needed to understand how the PDA and the applications on the PDA translate to technicians for fitting and diagnostic services.

Instead of starting with technology, the team started with people and culture.

So if human needs are the starting point, design thinking quickly moves to learning by making.

Instead of thinking what to build, build to think.

Today, prototypes accelerate the process of innovation. Because it's only when you take an idea out into the world that you really begin to understand its strengths and weaknesses.

And the faster you do it, the faster your ideas will evolve.

Well, much has been said and written about the Aravind Eye Institute in Madurai, India.

They do a great job of serving very poor patients by taking income from those who can afford it and providing cross subsidies to those who can't.

Now they are very efficient, but they are also very innovative.

When I visited them a few years ago, what really impressed me was their willingness to prototype their ideas very quickly.

This is one of the company's largest cost breakthrough manufacturing facilities.

They make their own intraocular lenses.

A lens that replaces a lens damaged by a cataract.

And I think their breakthrough was partly due to their prototyping ethos.

That's because we've lowered the cost from $200 to just $4 per pair.

In part, they did this by using the basement of one of the hospitals instead of building a fancy new factory.

It also used low-cost CAD/CAM prototyping techniques instead of the large machinery used by Western manufacturers.

The company is now the largest manufacturer of these lenses in the developing world and recently moved to a custom factory.

So if human needs are the starting point and prototyping is the vehicle for progress, there are some questions to ask about the destination as well.

Rather than having consumption as the primary objective, design thinking is beginning to explore the possibilities of participation, moving from a passive relationship between consumers and producers to active participation by all in meaningful, productive, and profitable experiences.

So I think that taking this idea that Rory Sutherland spoke about, that the intangible is probably more valuable than the physical, and taking it a little further, the design of participatory systems in which more forms of value than just cash are created and measured, will be a major theme, not just for design, but for our economy going forward.

So when William Beveridge wrote his first famous report in 1942, he wanted every citizen to take an active part in their own social welfare and created what would become the British welfare state.

By the time he wrote his third report, he confessed that he had failed and instead created a welfare consumer society.

Participle's Hilary Cottam, Charlie Leadbeater and Hugo Manathay have embraced this notion of participation, proposing a framework for reinventing the welfare state in a manifesto entitled Beveridge 4.0.

So, in one of our projects called the Southwark Circle, we worked with Southwark residents and a small team of designers to develop a new membership organization to help older people with housework.

The design was refined and developed with 150 seniors and their families before the service launched earlier this year.

We accept this idea of ​​participation as perhaps the logical conclusion, and say that design can have the greatest impact when it leaves the hands of the designer and is in everyone's hands.

Nurses and practitioners at Kaiser Permanente, the U.S. healthcare system, are researching the subject of improving the patient experience, with a particular focus on how to exchange knowledge and change shifts.

Through a program of observational studies, brainstorming new solutions, and rapid prototyping, they have developed a whole new way of changing shifts.

They locked themselves in the nurses' station to discuss the different conditions and needs of their patients, leading to the development of the system on the ward using simple software tools in front of the patient.

This reduced the average time away from the patient from 40 minutes to 12 minutes.

These increased patient confidence and nurses' well-being.

Multiply this by all the nurses on all wards of the 40 hospitals in the system, and the impact is actually quite large.

And this is just one of thousands of opportunities in healthcare alone.

These are just some of the basic ideas about design thinking and the new kinds of projects they are being applied to.

But I would like to return to Brunel here and suggest a link that might explain why this is happening now, and perhaps why design thinking is a useful tool.

And that connection is change.

Times of change require new options and new ideas.

Well, Brunel was working at the height of the Industrial Revolution when life and the economy were all being reinvented.

Today, the industrial system of Brunel's time has reached its limits, and indeed is part of today's problems.

But again, we are in the midst of a big change.

And that change forces us to ask very fundamental aspects of society: how we keep ourselves healthy, how we govern ourselves, how we educate ourselves, how we keep ourselves safe.

And in times of change like this, we need these new alternatives because existing solutions are simply becoming obsolete.

So why do design thinking?

Because it gives us new ways to approach problems.

Instead of defaulting to the usual convergent approach of making the best choice among available options, it encourages us to take a divergent approach and explore new alternatives, new solutions, and new ideas that have never existed before.

But before going through that branching process, there is actually a very important first step.

So what is the question we are trying to answer?

What is the design outline?

Now Brunel might have asked the question: "How can I take the train from London to New York?"

But what questions might we ask today?

These are the things we are being asked to think about these days.

One in particular is a project funded by the Bill & Melinda Gates Foundation that we're working on with the Acumen Fund.

How can we improve access to safe drinking water for the world's poorest people, while at the same time fostering innovation among local water providers?

So instead of having many American designers come up with new ideas that may or may not be appropriate, we took a more open, collaborative and participatory approach.

We worked with designers, investment professionals and 11 water companies across India.

Through workshops, we have developed innovative new products, services and business models.

We hosted a competition and funded 5 of those organizations to develop their ideas.

So they developed and iterated on these ideas.

IDEO and Acumen then spent several weeks working with them to help design new social marketing campaigns, community outreach strategies, business models, new water containers to store water and carts to deliver water.

Some of those ideas have just hit the market.

And the same process is exactly underway with NGOs in East Africa.

So for me, this project shows how far I can go from the little things I was working on early in my career.

By focusing on human needs, using prototypes to move ideas forward quickly, taking the process out of the hands of designers, and engaging community participation, we can tackle bigger and more interesting problems.

And just like Brunel, you can have a greater impact by focusing on systems.

That's one of the things we're working on.

I'm actually very curious and would probably like to know what this community thinks we can work on.

What kinds of questions do you think design thinking can be used to address?

If you have any ideas, feel free to post them on Twitter.

There is a hashtag #CBDQ that you can use.

And a little while ago the list looked like this.

Of course, you can also use the same hash code to search for questions of interest.

So we like to believe that design thinking can really make a difference, and help us generate new ideas and new innovations beyond the latest high-street products.

To do that, I think we need to look at design more broadly, like Brunel, rather than in the realm of professional clerics.

And the first step is to start asking the right questions.

thank you very much.

(applause)

As a historian of religion, I have been frustrated for years because I am keenly aware of the centrality of compassion in all the major faiths of the world.

Each of them has evolved their own version of what is called the Golden Rule.

Sometimes it can be a positive version. "Always treat others as you would like them to treat you."

And just as important is the negative version. "Don't do to others what you don't want them to do to you."

Look into your heart, discover what is causing you pain, and refuse to inflict that pain on others under any circumstances.

And people have stressed the importance of compassion, not just because it sounds good, but because it actually works.

People realized that when they practiced the Golden Rule, which Confucius said “all day, every day,” it was not a matter of doing good deeds that day and returning to a life of greed and selfishness, but by practicing it all day long, they pulled themselves away from the center of the world, put others there, and transcended themselves.

And it brings you to the presence of what is called God, Nirvana, Rama, Tao.

Something beyond what we know in our ego-bound existence.

But you would never normally realize that this was the center of religious life.

Because, with a few fine exceptions, when religious people get together, when religious leaders get together, it's all too common to discuss esoteric doctrines, voicing hate, denouncing homosexuality and the like.

A lot of times people really don't want to be compassionate.

When I talk to congregations of religious people, I sometimes see a certain rebellious look on their faces. Because people often want to be right.

And of course that defeats the purpose of the exercise.

Now, why was I so appreciative of TED?

Because they so gently took me out of my book-lined library, transported me into the 21st century, and enabled me to speak to a far wider audience than I ever imagined.

Because I feel threatened by this.

Unless we can put this golden rule into practice on a global scale, treating everyone everywhere and everyone as if they matter as much as we do, I doubt we will have a viable world to pass on to future generations.

One of the challenges of our time, and one of the great challenges, is, as I said earlier, to build a global society where people can coexist peacefully.

And religion, which should have been a major contributor, is seen as part of the problem.

And of course, religious people aren't the only ones who believe in the Golden Rule.

This is the source of all morality, the imaginative act of empathy that puts oneself in another's place.

And it seems to me that we have a choice.

We can continue to bring up and emphasize dogmatic and intolerant aspects of our faith, or we can go back to the rabbis. Rabbi Hillel, a contemporary of Jesus, was asked by a heathen to stand on one leg and summarize the entire teaching of Judaism, saying, "Do not do to your neighbor what you hate.

That is the law, and the rest are mere explanations. ”

and the rabbis and the early fathers of the church who said that any interpretation of the Bible that engenders hatred and contempt is illegal.

And we need to revive that spirit.

And it doesn't just happen because the spirit of love wafts over us.

We have to make this happen, and with the latest communication introduced by TED, we can.

I am already very encouraged by the reactions of all my partners.

In Singapore, there are groups trying to use the charter to heal the divisions that have recently arisen in Singaporean society, and some members of parliament want to implement the charter politically.

In Malaysia, top artists bring together people and young people for art exhibitions that show that compassion is at the heart of all art.

Across Europe, Muslim communities hold events and discussions to debate the centrality of compassion in Islam and all faiths.

But we can't stop there. It doesn't stop at launch.

Religious teachings, this is where we have gone astray by focusing only on believing in arcane dogmas.

Religious teachings must always be linked to action.

And I will work on this until the day I die.

And I want to continue doing two things with my partner: educating and inspiring compassionate thinking.

Education is because we have lost so much compassion.

People often think it just means feeling sorry for someone.

But of course, you can't understand compassion just by thinking about it.

You must too.

I want the media to get involved because they are essential in breaking down the stereotypes about others that divide us from each other.

The same applies to educators.

I want young people to feel the dynamism, dynamism and challenges of a caring lifestyle.

And understand that it requires a keen intellect, not just a sticky feeling.

I invite scholars to explore the theme of compassion within their own and other people's traditions.

And perhaps most of all, because people have this charter, it encourages sensitivity to callous rhetoric so that they feel empowered to challenge cruel or disparaging rhetoric from religious, political, and industry leaders, regardless of their convictions.

Because we have the ability to change the world.

I never thought of putting the Charter online.

I was still stuck from the old world of a bunch of coffins sitting together in a room making yet another esoteric statement.

And TED gave me a whole new way of thinking and presenting ideas.

Because that's what's great about TED.

Bringing all this expertise together in this room could change the world.

And of course, problems can sometimes seem insurmountable.

But I would like to quote Finally, I end with a reference to a British author, a lesser-quoted Oxford author, C.S. Lewis.

But he wrote something that has stuck with me ever since I read it as a student.

It's in his book The Four Loves.

He said he distinguishes erotic love in which two people stare into each other's eyes in rapture.

And he likened it to friendship. It's when two people stand side-by-side, sort of, looking toward a common goal.

We don't have to fall in love with each other, but we can be friends.

And I am sure.

During our brief discussion at Vevey, I felt strongly that when people of all different beliefs come together and work together towards a common goal, differences melt away.

And we learn friendship.

And we live together and learn to get to know each other.

thank you very much.

(applause)

According to the theory of human social development, we are currently living in the information age, the fourth great age of technological progress.

Digital connectivity is a modern miracle.

It can be said that it has broken down the barriers of time and space that separate people and has created the conditions of an era in which information and ideas can be freely shared.

But are these great achievements in digital technology really in the final stages of what is achievable?

I do not think so. Today I would like to share with you what I believe digital technology can take us to the next level.

I am a surgeon by profession, and as I stand here today talking to you, 5 billion people worldwide do not have access to safe surgical care.

5 billion people.

That's 70 percent of the world's population, who, according to the WHO's Lancet Commission, don't even have access to simple surgery when needed.

Let's zoom in on Sierra Leone, a country with a population of 6 million. A recent survey showed that there are only 10 qualified surgeons.

This equates to one surgeon in every 600,000 people.

The numbers are staggering and you don't even need to look that far.

Looking around here in the United States, a recent study reported that we will need 100,000 more surgeons by 2030 just to meet the demand for routine surgery.

At this rate, we won't be able to reach that number.

As a surgeon, this is a global problem that bothers me.

It bothers me so much because I have seen firsthand how the lack of access to safe and affordable healthcare destroys the lives of ordinary people.

If you are a patient who needs surgery and no surgeon is available, you are left with a very difficult choice: wait, travel, or not have surgery at all.

So what would be the answer?

Well, some of you carry around some of that solution today, whether it's your smartphone, your tablet, or your computer.

Because for me, digital communication technology has the power to do so much more than just being able to shop online, connect and stay up to date through social media platforms.

It has the power to help solve some of the key problems we face, such as lack of access to critical surgical services.

And today I want to share with you an example of how I think it can be done.

The history of surgery is replete with breakthroughs in how science and technology helped surgeons of the time face their greatest challenges.

Dating back hundreds of years, an understanding of microbiology led to the development of antiseptic techniques, which played a major role in ensuring that patients remained alive after surgery.

Hundreds of years later, keyhole surgery and arthroscopic surgery were developed to combine video technology and precision instruments to make the surgery less invasive.

And these days, many people will know about robotic surgery. What robotics brings to surgery is much like modern automated machines, ultra-precision, and the ability to perform procedures at the smallest scale with precision surpassing that of the human hand.

But robotic surgery has brought something else to surgery. The idea is that the surgeon doesn't need to stand at the patient's bedside to actually care, but can give instructions to the robot through the computer while looking at the screen.

We call this telesurgery.

It is our duty to find solutions that solve these answers in a cost-effective and scalable way, enabling anyone, anywhere in the world, to address these problems.

What if I told you that you don't really need a million-dollar robot to perform remote surgery?

All you needed was a phone, tablet or computer, an internet connection, a confident colleague on site, and one magic ingredient: augmented reality collaboration software.

With this augmented reality collaboration software, skilled surgeons can virtually transport themselves to any clinical setting simply by using their mobile phone, tablet, or computer, interact visually and practically from start to finish, and guide and guide local physicians step-by-step through the procedure.

Well, enough talking about it.

Now let me show you.

From here, we speak live with Dr. Mark Tompkins, an orthopedic surgeon at the University of Minnesota.

He is going to perform arthroscopic surgery for us, i.e. keyhole knee surgery, and we want to make it public that this patient has consented to stream the surgery.

I would also like to point out that for the sake of time, we are just going through the first steps, marking up the patient and identifying some key anatomical landmarks.

Hello Dr. Tompkins, can you hear me?

Dr. Mark Tompkins: Good morning, Nadine.

Nadine Hahahaharam: Greetings from everyone at TED.

Audience: Hello.

NHH: Alright Dr. Tompkins, let's get started.

So let's start with where to make the incisions on either side of the patellar tendon.

So if you can make an incision here and there, you should hopefully get to your knee.

MT: Okay, let's go in.

NHH: Great.

So we're getting into the joint now.

Now let's spin around and take a quick look at the meniscus.

MT: Perfect.

NHH: Great. There is a small tear in the meniscus, but otherwise everything seems fine.

And if you turn around and head in this direction, follow my fingers and take a quick look at the ACL and PCL.

That's your ACL, it looks pretty sane, and there's nothing wrong with it.

So, I only saw a small meniscal tear there, but otherwise the fluid around the joint seems fine as well.

Okay, thank you, Dr. Tompkins. Thank you for your time.

I will continue.

have a good day. good bye.

(Applause.) I hope this simple demonstration illustrates how powerful this technology is.

I would like to point out that I am not using any special equipment, just a laptop and a very simple webcam.

We are used to using digital technology to communicate through voice, text, and video, but augmented reality can go even deeper.

This allows two people to interact virtually in a way similar to how they would work together in real life.

Being able to show, explain, demonstrate, and gesture to someone what you want to do is much more powerful than just telling them.

And since we learn better through first-hand experience, this makes for a very good learning tool.

So how is this changing the world?

Back at my teaching hospital, we have used this to support local regional general hospitals and provide skin cancer surgeries and trauma care.

Patients can now receive treatment at the community level.

This reduces travel time, improves access and saves money.

Its use is also beginning to be identified in nurse wound care management and outpatient management.

Most recently, and very excitingly, it was used to support surgeons removing cancer in the kidney.

I would like to share a quick video here.

I'm sorry if some of them look cruel.

(Video) Doctor 1: Okay. show me again

Doctor 2: If you look here, that's the top, outermost part of the tumor.

Doctor 1: Yes.

Doctor 2: It's three centimeters deep, so this should be three centimeters.

Doctor 1: Yes, yes.

Doctor 2: Okay. A margin of 3.5 is required.

Doctor 1: Just show it to me and let me know what you think of it.

NHH: We are also seeing the use of this technology on a global scale. One of the most heartwarming stories I can recall is in the town of Trujillo, north of Lima, Peru. There, the technology was used to help provide cleft lip and palate surgery to children from poor backgrounds without access to health insurance.

And in this town, there was a hospital where there was a surgeon, Dr. Soraya, who devoted himself to this treatment.

Now Dr. Soraya was struggling with the strong demands of the local population and the fact that he had no special training for this procedure.

So, with the help of a charity, we were able to connect her with a laceration surgeon in California. And using this technique, he was able to guide, mentor, train and teach her and her colleagues step by step procedures.

Within months, 30% more surgeries could be performed with fewer and fewer complications.

And now Dr. Soraya and her team can perform these surgeries independently, competently and confidently.

And I remember my mother saying, "This technology gave my daughter a smile."

To me, this is the real power of this technology.

Beauty is about breaking boundaries.

It overcomes all technical difficulties.

It brings people together. Democratize access.

Wi-Fi and mobile technology are growing rapidly and should play a role in facilitating surgical delivery.

I have even seen it used in conflict zones where there is considerable risk in getting specialist surgeons to certain locations.

In a world where there are more mobile devices than people, mobile devices have a truly global impact.

Of course, we still have a long way to go before we can solve the problem of getting 5 billion people to have surgery, and unfortunately some people don't have access to the internet.

However, things are rapidly moving in the right direction.

The potential for change is there.

My team and I are expanding our global presence and are beginning to see the potential of this technology.

Through digital technology, through the simple everyday devices we take for granted, through the devices of the future, we can do truly miraculous things.

thank you.

(applause)

I have a very difficult task.

I'm a spectroscopist.

You have to talk about astronomy without showing a single image of nebulae, galaxies, etc.

Because my job is spectroscopy.

I never work with images.

But I will try to convince you that spectroscopy is something that can actually change this world.

Spectroscopy could possibly answer the question, "Is anyone there?"

are we alone? Seti.

Spectroscopy is not very fun.

One of my colleagues in Bulgaria, Nevena Malkova, spent about 20 years studying these profiles.

And she has published 42 articles devoted exclusively to this subject.

Can you imagine? Day and night, thinking, observing, gazing at the same star for 20 years is amazing.

But we are crazy. we do these things.

(Laughter.) And I'm not that far off.

I spent about 8 months creating these profiles.

Because I noticed a very small symmetry in the profile of one of the planet's primary stars.

And I thought maybe there is lithium-6 on this planet. This indicates that this star has swallowed a planet.

Apparently, this fragile isotope of lithium-6 cannot exist in the atmosphere of a star like the Sun.

But planets and asteroids have it.

So swallowing a planet or a number of asteroids would include this lithium 6 isotope in the spectrum of the star.

So I spent over eight months just researching this star's profile.

And actually this is amazing. Because many reporters have called me asking, "Have you ever actually seen a planet enter a star?"

Because they thought that if you had a telescope, you were an astronomer, and what you were doing was actually looking into it.

And you may have seen planets enter stars.

And I said, "No, I'm sorry.

What I'm seeing is this. ”

(Laughter) It's really unbelievable. Because no one really understood.

I think very few people really understood what I was saying.

This is because it indicates that a planet has entered a star.

very.

The power of spectroscopy was actually realized in 1973 by Pink Floyd.

(Laughter) Because they actually said you can get any color you want in the spectrum.

All you need is time and money to build a spectrometer.

Called HARPS, it's the number one high-resolution, most accurate spectrometer on Earth, and it's actually used to detect sound waves in the atmospheres of exoplanets and stars.

How do we get the spectrum?

I think most people know from school physics that it basically splits white light into colors.

And if you have a hot mass of liquid, it produces what is called a continuous spectrum.

Hot gases only produce emission lines, not the continuum.

And if you put a cold gas in front of a hot source, you'll see a specific pattern called absorption lines.

This is actually used to identify chemical elements in cold matter that are absorbing exactly at those frequencies.

So what can we do with the spectrum?

You can actually study the radial velocity of space objects.

You can also study the chemical composition and physical parameters of stars, galaxies and nebulae.

A star is the simplest object.

Thermonuclear reactions proceed in the core, producing chemical elements.

and has a cool vibe.

It's cool for me.

In my terms, coolness is 3, 4, 5000 degrees.

My colleagues in infrared astronomy claim that minus 200 Kelvin is cool for them.

But as you know, everything is relative.

So 5,000 degrees is pretty cool to me.

(Laughter) This is the spectrum of the Sun. There are 24,000 spectral lines, and about 15% of these lines have yet to be identified.

It's amazing. So, we're in the 21st century, and we still don't have an accurate understanding of the Sun's spectrum.

To measure the composition of chemical elements in the atmosphere, you may have to work with just one small, weak spectral line.

For example, we can see that the gold spectral line is the only spectral line in the Sun's spectrum.

We then use this weak feature to measure the composition of gold in the Sun's atmosphere.

And now this is a work in progress.

We have dealt with similarly very weak features belonging to osmium.

It is a heavy element produced by the thermonuclear explosion of a supernova.

In fact, this is the only place where osmium can be produced.

By simply comparing the composition of osmium in one of the planetary stars, we hope to understand why the element is so abundant.

Perhaps we even suspect that supernova explosions can trigger the formation of planets and stars.

It can be an indicator.

My colleague from Berkeley, Gibor Basri, emailed me a very interesting spectrum the other day and asked, "Can you take a look at this?"

And when I saw that the star's spectrum contained large amounts of oxygen and other elements, I couldn't sleep for the next two weeks.

We knew nothing of the kind had been observed in the galaxy.

It was unbelievable. The only conclusion we can draw from this is clear evidence that there was a supernova explosion in this system that polluted the star's atmosphere.

After that, a black hole was formed in the binary star system, and it still exists with a mass of about five times the mass of the sun.

This was considered the first evidence that black holes actually arise from supernova explosions.

A colleague of mine has been comparing the chemical elemental composition of stars in different galaxies and has indeed discovered an alien star within our own galaxy.

It's amazing what you can do just by studying the chemical composition of stars.

They actually said that one of the stars visible in the spectrum is an alien. It comes from another galaxy.

There are intergalactic interactions. we know this

And sometimes they just catch stars.

You've probably heard of solar flares.

We were very surprised to discover superflares, flares thousands of times more powerful than those seen on the Sun.

A superflare has been detected in one of the binary stars in our galaxy called Leo FH.

And then we went to study spectral stars to see if there were any oddities with these objects.

And everything turned out to be fine.

These stars are as ordinary as the Sun. Age was normal.

So this is a mystery.

One of the mysteries that still remains is superflares.

And 6 or 7 similar cases have been reported.

To move forward with this, we need to really understand the chemical evolution of the universe.

It's very complicated. I don't want you to try to understand what's here.

(Laughter) But that's just to show how complex the whole story of the creation of the chemical elements is.

There are two channels in the universe that produce and recycle matter and chemical elements: massive stars and low-mass stars.

If we keep doing this for 14 billion years, we get this picture. This is a very important graph showing the relative abundance of chemical elements in Sun-like stars and the interstellar medium.

This means that it is practically impossible to find an object that contains about ten times as much sulfur as silicon and five times as much calcium as oxygen. It is impossible.

If you find one, say that this is something related to SETI. Naturally, you can't do that.

The Doppler effect is very important in basic physics.

And this has to do with the change in frequency of the moving sound source.

The Doppler effect is used to discover extrasolar planets.

The accuracy required to detect Jupiter-like planets around Sun-like stars is on the order of 28.4 meters per second.

And 9 centimeters per second is required to detect an Earth-like planet.

This can be done in future spectrometers.

I myself am actually part of a team developing a CODEX, high resolution, next generation spectrometer for the 42m E-ELT telescope.

And this will be an instrument for detecting Earth-like planets around Sun-like stars.

This is an amazing tool called seismology, which can detect sound waves in the atmosphere of stars.

This is the Alphasen sound.

Sound waves can be detected in the atmospheres of stars like the Sun.

Those waves have frequencies in the infrasound region, the realm of sound that no one really knows.

Back to the most important question. "Is anyone there?"

This is closely related to planetary crustal activity and volcanic activity.

The relationship between life and radioactive nuclei is simple.

Without crustal and volcanic activity, life would not exist.

And we are well aware that geothermal energy is primarily produced by the decay of uranium, thorium and potassium.

How to measure it is that if there is a planet with low amounts of these elements and the planet is tectonically dead, life cannot exist.

Too much uranium, potassium, and thorium would probably make life non-existent again.

'Cause can you imagine everything boiling?

There is too much energy on earth.

We are currently measuring the abundance of thorium in one of the exoplanet stars.

It's the exact same game. It's a very small feature.

We are actually measuring this profile and trying to detect thorium.

It is very difficult. It is very difficult.

And you have to convince yourself first.

Then you have to convince your colleagues.

And we have to convince the whole world that we actually detected something like this in the atmosphere of an exoplanetary star 100 parsecs away from here.

It's really difficult.

But if you want to know about life on exoplanets, you have to do this job.

Because we need to know how many radioactive elements are in those systems.

One way to find out about aliens is to tune radio telescopes and listen for signals.

If you get anything interesting, that's what SETI actually does, what SETI has been doing for years.

I think the most promising way is to use biomarkers.

You can see the spectrum of the Earth, the spectrum of this Earthshine, which is a very clear signal.

The approaching slope is called the Red Edge and a vegetated area was detected.

It is surprising that vegetation can be detected from spectra.

Now imagine doing this test on other planets.

Now, very recently, very recently, in the last 6, 7, 8 months, we've detected water, methane, and carbon dioxide in the spectra of extrasolar planets.

very. This is the power of spectroscopy.

We can actually go to planets far from our solar system, detect them, and study their chemical composition.

Oxygen or ozone must be detected to see if all the conditions necessary to sustain life are present.

Cosmic miracles may be related to SETI.

Now imagine an object, an amazing object, or something you can't explain when you simply stand up and say, "Look, I gave up. Physics doesn't work."

So you can always refer to SETI and say, "Somebody must be doing this somehow."

And with respect to known physics and such, that's actually something that was pointed out by Frank Drake and Shklowski many years ago.

If a strange chemical element is seen in the spectrum of a planet's host star, it could be a signal from a civilization present there, and they want to signal about it.

They want to actually make their presence known in a variety of ways through these spectral lines within the star's spectrum.

There are various ways to do this.

One, for example, technetium is a radioactive element with a decay time of 4.2 million years.

If you suddenly observe technetium in a star similar to the Sun, you can be sure that someone put this element into the atmosphere, since it is impossible to do this by natural means.

We are currently studying the spectra of about 300 stars, including exoplanets.

We have been doing this work since 2000 and it is a very demanding project.

We have worked very hard.

And there are some interesting cases, candidates, etc., that are really unexplainable.

And I hope that in the near future we will be able to confirm this.

The key question then is, "Are we alone?"

I don't think it comes from UFOs.

It does not come from radio signals.

I think it comes from a spectrum like this.

This is the spectrum of an Earth-like planet, showing the presence of nitrogen dioxide as distinct signals of life, as well as oxygen and ozone.

Someday, I think it will be within 15 or 20 years from now.

If we find a spectrum like this, we can be sure that there is life on that planet.

Within about five years, an Earth-like planet at the same distance from the Sun as the Earth will be discovered around a Sun-like star.

It will take about 5 years.

And it will take another 10-15 years in space projects to get the spectrum of an Earth-like planet like the one I showed.

If you look at nitrogen dioxide and oxygen, I think you get the perfect E.T.

thank you very much.

(applause)

I run a design studio in New York.

Every seven years, I close the company for a year to do a small experiment, which is always difficult to achieve during normal working hours.

None of the clients were available that year.

We are completely closed.

And as you can imagine, it's a wonderful, very energetic time.

I originally opened a studio in New York to combine my two loves: music and design.

And we've created videos and packages for many musicians you know and musicians you haven't heard yet.

As I've noticed, like so many things I actually love in life, I'm adjusting to it.

And over time, you get tired of them.

And indeed, in our case, our work began to look the same.

Here you can see the glass eyes in the die-cutting of the book.

A similar idea could be a perfume die-cut and packaged in a book.

So I decided to close for a year.

We also know that today we spend the first 25 years of our lives learning, and then have another 40 years set aside for actual work.

And it will take about 15 years to finally retire.

And I thought it might help to basically cut five of those retirement years and sandwich them between service years.

(Applause.) It's obviously fun for me.

But perhaps even more importantly, the work that has been created in the last few years will not only benefit one or two grandchildren, but will flow back to the company and society at large.

Fellow TEDster Jonathan Haidt, who spoke two years ago, defined his work on three different levels.

And they sounded very true to me.

You can treat your work as work. I do it for the money.

I may already be looking forward to Thursday weekend.

And you'll probably need a hobby as a means of leveling.

Career-wise, I'm definitely more active.

But at the same time, there will be times when you wonder if the hard work is really worth it.

During my third vocation, it is very likely that I will, even if I am not financially compensated.

I'm not a religious person myself, but I was looking for nature.

I spent my first sabbatical in New York City.

I was looking for something different for the second time.

I know Europe and America so well that it didn't appeal to me. It was just Asia.

The most beautiful landscapes I have seen in Asia were Sri Lanka and Bali.

Sri Lanka was still in a civil war, so was Bali.

It's a great, very craft-oriented society.

I arrived there in September 2008 and started working immediately.

Great inspiration comes from the region itself.

But the first thing I needed was mosquito repellent typography. Because mosquitoes were definitely present in large numbers.

And I needed some way to get back to the stray dogs that live around the house and attack me during my morning walks.

So we created this series of 99 portraits printed on t-shirts.

All dogs on one t-shirt.

As a little retaliation, write a slightly threatening message on the back of your shirt (laughs).

(Laughter) Right before I left New York, I decided to actually renovate my studio.

Leave everything else to them.

And I don't have to do anything.

I looked for furniture there.

And all the furniture I really liked turned out to be unaffordable.

And I didn't like any of the things I could buy.

One of the things we pursued in Bali was furniture.

Of course, this still works for stray dogs.

Not quite finished yet.

And by the time this lamp was born, I think I had finally made peace with those dogs (laughs).

(Laughter) And then there's the coffee table. I also made a coffee table.

It's called "Be Here Now".

Contains 330 compasses.

I had a custom espresso cup made with a magnet hidden inside to keep the compass centered.

Then again, this is a rather talkative and redundant kind of chair.

I also started meditating for the first time in my life in Bali.

And at the same time, I know how boring it can be to hear about other people's happiness.

So I won't go into too much depth.

Many of you are familiar with this book by TED star Danny Gilbert. I actually got this book through the TED Book Club.

I think it took me four years to finally read it during my sabbatical.

And I was delighted to learn that he actually wrote this book during his sabbatical.

Here are some successful people who have taken sabbatical leave.

I'm Ferran Adrià. Many consider him the best chef in the world right now at El Bulli, a restaurant north of Barcelona.

His restaurant is open for seven months each year.

He closes the shop for five months to experiment with a full kitchen staff.

His latest numbers are pretty impressive.

It can accommodate 8,000 people all year round.

And he has 2.2 million booking requests.

Looking at my cycle, I have a 7 year, 1 year sabbatical which is 12.5% ​​of my time.

And if you look at companies that are actually more successful than me, 3M has been giving every engineer 15 percent since the 1930s to pursue what they want.

There are also good success stories.

Scotchtape grew out of this program, and Art Fry developed Sticky Notes while working privately at 3M.

Of course, Google very famously gives software engineers 20 percent to drive their personal projects.

Has anyone here actually taken a sabbatical?

That's about 5 percent of everyone.

So I don't know if I saw my neighbor raise his hand.

Tell them if it was successful.

I've found that the best way to find out what you'll love in the future is to talk to people who are actually doing it better than you imagined.

When I decided to do something, I went through the process of making a decision and writing it down in my daily planner book.

And I told as many people as possible about it so that they wouldn't run away from me later.

(Laughter) During my first sabbatical, it was pretty dire.

I thought I should do this without a plan. I thought this blank time would be a wonderful and engaging place to generate ideas. It wasn't.

I didn't have a plan, I just responded to small requests, not work requests, that everyone declined.

Sending e-mails to Japanese design magazines.

So I became an intern myself.

(Laughter) And I quickly made a list of my interests, layered them, and organized them into time blocks. This was exactly the same as when I was in elementary school.

What is written here? Monday, 8-9: Story writing. 9-10: Future thinking.

not very successful. etc.

And in fact it worked quite well for me, especially as a starting point for my first sabbatical.

What came out of it?

We are getting closer to the design.

i had a good time.

Financially, it really succeeded in the long run.

Now that the quality has improved, we can ask for a higher price.

And perhaps most importantly, basically everything we've done in the seven years since our first sabbatical was born with that one year in mind.

And here are some of the projects that were born in the seven years after that sabbatical.

One of the ideas I was involved with was that sameness is incredibly overrated.

This idea that everything should be exactly the same only works for a small percentage of companies and not for all others.

We were commissioned to design the identity of Casa da Musica, a music center built by Rem Koolhaas in Porto, Portugal.

And I wanted to achieve identity without architecture, but I failed.

And mainly because I noticed from Rem Koolhaas' presentation in the city of Porto that he talked about an assemblage of different layers of meaning.

After translating a speech about architecture into normal English, I basically understood it as a logo creation.

Then I realized that the building itself was the logo.

So it became a no-brainer.

I put on my mask and looked deep into the earth, looking west, north, south, east, up, down, in all directions.

I had a friend of mine write a piece of software called Casa da Musica Logo Generator and colored it in a very specific way.

It's connected to a scanner.

Any image can be put there, like Beethoven's image.

The software then immediately displays the Casa da Musica Beethoven logo.

If you actually need to design a Beethoven poster, this will help because the visual information of the logo and the actual poster are exactly the same.

So of course conceptually they always fit.

When Zappa's music is played, it gets its own logo.

Alternatively, Philip Glass, Lou Reed and The Chemical Brothers who played there each got their own Casa da Musica logo.

Internally, it would work equally well for the president and the music director, with a portrait of the Casa da Musica on their business cards.

A full-fledged orchestra lives in the building.

It has a more transparent identity.

The truck they go on tour with.

Alternatively, there is a small modern orchestra of 12 people remixing their own titles.

One useful feature is that you can get a logotype and create an ad from it.

Like this Donna Tony poster, Chopin, Mozart, La Monte Young.

You can take the shape and create typography from it.

It can grow under the skin.

You can put up posters of family events in front of your house, and posters of raves, weekly programs, and educational services under your house.

Second insight. So far, I've been mostly involved in and using design language for promotional purposes, and that's fine.

On the one hand, I have nothing against selling.

Both of my parents are salespeople.

But if you feel you've spent so much time learning this language, why promote using only this language?

there must be something else.

And a whole series of works was born out of it.

Some of you may have seen it.

I shared some of that earlier at a previous TED, titled "What I've Learned in My Life".

I will introduce only two from now on.

Here's a wall of bananas of varying ripeness on the opening day of this gallery in New York.

“Confidence produces good results.”

This is a week later.

2 weeks later, 3 weeks later, 4 weeks later, 5 weeks later.

And you can see that confidence is almost, but not completely back.

These are some photos that visitors sent me.

(laughter) And the city of Amsterdam gave us a square and asked us to do something.

We used a stone plate as a grid for our small pieces.

Received 250,000 coins from central banks in various darknesses.

So I got a brand new one, a glossy one, a medium one, and a very old and dark one.

Then, with the help of 100 volunteers, I spent a week creating this pretty floral typography that spelled out, "Obsession makes my life worse and my work better."

And, of course, the idea was to ask, as a viewer, "Should I really get as much money as possible?

Or is it better to leave it as is? ”

While we built all this in one week with 100 volunteers, quite a few neighbors surrounding the square got very close to it and loved it.

So it was finally done and one of the neighbors called the police on the first night when a man came in with a big plastic bag and scooped up as much coins as he could carry.

And then the Amsterdam police came out of their wits and wanted to see and protect the work of art.

And they cleaned it all up and detained them at police headquarters.

(Laughter) You know, I see them cleaning. I see them cleaning here.

It's the police, get rid of everything.

After 8 hours, pretty much all that is left.

(Laughter) We are also working on starting a bigger project in Bali.

It's a movie about happiness.

And here I had the pigs nearby give me the title.

It wasn't smooth enough.

So we asked the goose to do the same thing again, hoping that it would manage to do a more elegant and beautiful job.

And I think she went too far.

It's just a little too decorative.

And my studio is very close to Monkey Forest.

And the monkeys in the monkey forest actually looked pretty happy.

So we asked them to do it again.

They did a great job, but had some issues with readability.

So, of course, what you don't actually do yourself isn't actually done properly.

We plan to work on that film for the next two years.

Well then, it will take a while.

And of course, you might wonder if making a movie about happiness isn't worth much.

Then of course you can always go see this guy.

Video: (Laughter) And I'm happy to be alive.

I am happy to be alive. I am happy to be alive.

Stefan Sagmeister: Thank you.

(applause)

Hank Willis Thomas: I'm Deb's son.

(laughter) Deborah Willis: So I'm Hank's mom.

HWT: We've said it many times and made an article about it.

The song is called "Sometimes I See Myself In You" and talks about the symbiotic relationship we have built over the years through our lives and work.

And really, it's because wherever we go, together or apart, we carry these nicknames.

I've followed in my mother's footsteps since before I was born, but I don't know how to stop.

And as you get older, it gets harder.

No, seriously, it gets harder.

(laughter) My mother has taught me many things, but the most important one is that love conquers all.

She taught me that love is an action, not an emotion.

Love is a way of being, a way of doing, a way of hearing and a way of seeing.

DW: And the idea of ​​love, photographers are looking for love when they're taking pictures.

They are searching and searching to find love.

Growing up in North Philadelphia, I was surrounded by family and friends who took pictures and used family cameras as a way to tell stories about life, a life of joy, and what it meant to be a family in North Philadelphia.

So I spent most of my life looking for photographs that reflected my thoughts on Black love, Black joy, and family life.

Therefore, it is very important to think of the act of love overcoming as a verb.

HWT: Sometimes I wonder if my love of watching is genetic. Because, like my mother, I have loved photography since before I can remember.

Sometimes I wonder if photography and photography were my first love, after my mother and her mother.

No offense to my father, but it's the same as calling me "Ham" wherever I go.

I remember hiding all the photo albums because whenever I went to my grandmother's house, she was afraid of me asking, "Who's that person in that picture?"

'Who are they to you, and who are they to me, and how old were you when that picture was taken?

How old was I when that photo was taken?

And why black and white?

DW: Well, it's interesting just to think of the world in black and white.

I grew up in my mother's hair salon in North Philadelphia, and when I was browsing through Ebony Magazine, I found images that told stories that were often in family albums, not the daily news.

I wanted my family album to be an energizing and storytelling vehicle for me. Then one day at the Philadelphia Public Library I came across a book called Life's Sweet Flies by Roy DeCarava and Langston Hughes.

I think it was the title, the flypaper, the sweet stuff that drew my 7-year-old me, but to get my 7-year-old to think about it, I looked at the beautiful images made by Roy DeCaraba and thought about how to tell a story about life.

And the act of searching for me was an act that radically changed my life.

HWT: My friend Chris Johnson told me that all photographers, all artists are essentially trying to answer one question. I think your question was probably "Why don't the rest of the world see our beauty, and how can I make sure they see our community the same way I do?"

DW: When I was in art school, a male professor told me, probably true, that I occupied the space of good people.

He tried to thwart my dream of becoming a photographer.

He tried to humiliate me in a class full of male photographers.

He said I was out of place and disorganized as a woman, and furthermore said that when a good man could have a seat in this class, all you could and should do is have children.

I was shocked and silenced by the experience.

But I had my camera with me and decided I wanted to prove to him that I deserved the seat in that class.

But looking back, I asked myself, "Why did I have to prove it to him?"

You know, I had my camera with me and I knew I needed to prove to myself that I could make a difference with photography.

I love photography so no one can stop me from making images.

HWT: But that's when I came in.

DW: Yeah, I got pregnant the year I graduated.

Yes he was right.

And then I had you, shaking off the sexist language he used against me, picking up my camera and taking pictures every day, taking pictures of my pregnant belly while preparing for graduate school.

But I also thought black photographers were missing from the history books of photography, and I was looking for a way to tell a story.

Then I came across a book called A Choice of Weapons, an autobiography by Gordon Parks.

I took pictures and started making images. I hid the contact sheet I made on my pregnant belly. And you inspired me to create new works. It was a piece called 'Woman taking the place of a good man' and 'You took the good man's space' and then I used that word to reverse it and say 'I made a space for the good man, you'.

(Applause) HWT: Thank you, Mom.

Like a mother, like a son.

I grew up in a house with lots of pictures.

They were everywhere and my mother turned the kitchen into a darkroom.

And it wasn't just her photos and family photos that were there.

But the walls were adorned with pictures of people we didn't know, men and women we didn't know.

Thank you mom.

(laughs) I have my own timing.

(Laughter) Did you see her poking me?

(laughs) Doll thread.

I grew up in a house with lots of pictures.

(Applause.) But they weren't just pictures of the men and women we knew, they were pictures of people I didn't know. From what I learned in school, it was pretty clear that the rest of the world is not the same.

It took me a long time to figure out what she was trying to do, but after a while I figured it out.

When I was nine, she published a book called The Black Photographer, 1840-1940: A Biography.

And it's amazing to me, considering African Americans were taking pictures in 1840.

What does it mean to us to think that 20 or 30 years before slavery was abolished, people had to learn to read, learn how to do math, learn math, physics and chemistry to be on the cutting edge of technology and take just one picture?

And what made them so, if not love?

Well, that book led her to the next book, The Black Photographer 1940-1988, which led to another, another, another, another, another, another, another, another, another, and another.

(Applause.) And in my lifetime, she's edited and published dozens of books and curated dozens of exhibitions on every continent, not all about black photographers, but all inspired by the curiosity of a little black girl from North Philadelphia.

DW: What I realized was that black photographers have stories to tell and we need to listen to them.

And I found and discovered black photographers like Augustus Washington, who took beautiful daguerreotypes of the McGill family in the early 1840s and 1850s.

Their stories tended to be different as black photographers and had different stories about black life during the slavery era, but it was also about stories about family life, beauty, and community.

I didn't know how to connect the stories, but I knew teachers needed to know this story.

HWT: So I was my mother's first student, I think.

Reluctantly and unconsciously, with the puppet's thread, I decided to pick up a camera and take pictures of myself then and now, now and then.

I wondered how I could use photography to talk about how what happens outside the camera frame affects what we see inside.

The truth is always in the hands of the actual image creator and it's up to us to really consider what gets cropped.

I saw her research as a starting point for what I had seen in society, and began to think about how to use historical imagery to talk about the past as it exists in the present, and how to use photography in the form of sculpture, video, installation, and painting to talk about the enduring struggle for human and equal rights.

But through it all, one piece had the most impact on me.

It keeps me nourished.

This photo is based on a photo by Ernest Withers who took a picture of men and women standing in groups to confirm their humanity at the Memphis Sanitary Workers' March in 1968.

They had placards that read "I am a man", which I found surprising. Because the phrase I grew up with wasn't "I'm a man", it was "I'm a man". And I was amazed at how this collective statement during quarantine transformed into this seemingly selfish statement after integration.

I wanted to think about it, so I decided to remix the text in as many different ways as I could think of. I like to think of the top line as a chronology of American history and the last line as a poem. It reads, "I am a man. Who is a man. You are a man. What a man."

I'm a man. I have many It's me, it's me

I, I. I am, amen.

DW: Wow, it's very attractive.

(Applause.) But what we learn from this experience is that the two most powerful words in the English language are "I am."

And each of us has the capacity to love.

thank you.

(applause)

The longest trip I have ever been on.

That was in 2002.

I was only 19 years old.

It was my first time on an airplane, and my first time leaving my home country of Rwanda.

I had to travel thousands of kilometers to pursue my dream.

A dream I've had since childhood.

And that dream was to become an architect.

At that time it was not possible in my country.

There was no architecture school.

So when I won a scholarship to study in China, I left my life and family behind and moved to Shanghai.

It was a great time.

The country was experiencing a massive building boom.

Shanghai, my new hometown, was rapidly transforming into a skyscraper city.

China was changing.

A world-class project built to convey a new image of development.

Amazing modern engineering marvels were springing up literally everywhere.

But behind this surface, the exploitation of vast numbers of migrant workers, the massive forced displacement of thousands, made these projects possible.

And this fast-paced development has also contributed greatly to the pollution that plagues China today.

Back in 2010, I returned to Rwanda.

There I discovered a pattern of development similar to what I saw in China.

The country had and still has its own demographic and economic growth.

The pressure to build cities, infrastructure and buildings is at its peak, resulting in a massive building boom.

This is the reality across the African continent, and here's why.

Africa's population is expected to double to 2.5 billion by 2050.

At this point, Africa's population will be slightly smaller than the current population of China and India combined.

The infrastructure and buildings required to accommodate so many people are unprecedented in human history.

We estimate that by 2050 we will have to build 700 million more homes, more than 300,000 schools and nearly 100,000 health centers.

Let's look at it from your perspective.

Over the next 35 years, we will have to build 7 health centers, 25 schools and nearly 60,000 homes every day.

How do we build all this?

Will it follow the same model of unsustainable architecture and construction that I have witnessed in China?

Or can Africa develop its own sustainable and equitable development model?

I am optimistic that I can do it.

I know Africans who already do.

Take, for example, Nigerian architect Kunle Adeyemi's work in the slums of coastal metropolises.

In places like Makoko, Lagos, hundreds of thousands of people live in temporary structures on stilts over water, without government infrastructure or services.

Regions at high risk of sea-level rise and climate change.

Still, the people who live here are examples of great ingenuity and will to survive.

Kunle and his team have designed a prototype school that can withstand rising sea levels.

This is Makoko School.

It is a floating prototype structure that can be adapted for clinics, housing, markets and other critical infrastructure required by this community.

This is an ingenious solution that can ensure that this community lives safely in the waters of Lagos.

I'm Francis Kelle.

He works in Burkina Faso, his country of origin.

Kelleh and his team designed the project using traditional building techniques.

Kelleh and his team working in the community have developed a prototype school that the entire community will work together to build, like any project in the country's villages.

The children carry the stones for the foundation, the women carry the water for making the bricks, and everyone works together to beat the clay floor.

Kelleh and his team worked with the community to create a project that works better with proper lighting and good ventilation.

These are suitable for this particular situation and are really, really beautiful.

For the past seven years I have worked as an architect at the MASS Design Group.

A design company based in Rwanda.

We have been working in several African countries with a focus on this more equitable and sustainable model of architectural practice. Malawi is one of those countries.

It is a country of beautiful remote landscapes with high mountains and fertile valleys.

But it also has one of the worst maternal mortality rates in the world.

Pregnant women in Malawi give birth at home or have to walk a long way to the nearest clinic.

And 1 in 36 of these mothers will die during childbirth.

In Malawi, we worked with the team from the MASS Design Group to design the Kasungu Maternity Waiting Village.

This is where women go six weeks before their due date.

Here they receive prenatal care and training in nutrition and family planning.

At the same time, they form a community with other pregnant women and their families.

The Kasungu Waiting Village design borrows from the local typology of Malawian villages and is built using very simple materials and techniques.

The soil blocks used were made from the soil of this site.

This reduces the building's carbon footprint, but first and foremost provides a safe and dignified space for expectant mothers.

These examples demonstrate the power and agency of architecture and design to address complex issues.

But more importantly, we can develop models of effective solutions for our communities.

But these three examples alone are not enough.

300 more examples is not enough.

We need the entire African community of architects and designers to lead thousands more.

In May of this year, we hosted a symposium on African architecture in Kigali, inviting many leading African designers and architectural educators working across the continent.

We all had something in common.

All of us went to school abroad and outside of Africa.

This has to change.

If we want to develop our own solutions instead of turning Kigali into Beijing and Lagos into Shenzhen, we need a community that builds confidence in the design of the next generation of African architects and designers.

(Applause.) Last September, we launched the African Design Center to start building this community.

We have accepted 11 fellows from all over the continent.

This is a 20-month design-to-build fellowship program.

Here, as Kunle and his team are doing, they are learning how to tackle big challenges like urbanism and climate change.

As Kelle and his team do, they work with communities to develop innovative architectural solutions and processes.

As we at MASS Design Group have been researching for the past few years, they are learning to understand the health impact of better buildings.

The best moments of fellowship are the actual projects they designed and built.

This is the project they designed, Ruehe Elementary School.

They immersed themselves in the community to understand the challenges, but they also discovered opportunities, such as using a wall made of local volcanic stone to transform the entire campus into a space of play and active learning.

They assessed environmental conditions and developed a roof system that maximizes daylight and improves acoustic performance.

Construction of Ruhehe Primary School will begin this year.

(Applause.) And in the coming months, our colleagues at the African Design Center will work with the Rueje community to build this project.

When we asked the fellows what they hoped to do after their fellowships at the African Design Center, Tsepo, who is from South Africa, said he plans to open a private office in Johannesburg because he wants to introduce this new way of building to his country.

Zani wants to expand opportunities for women to become engineers.

Prior to joining the African Design Center, she helped launch an organization in Nairobi to bridge the gender gap for women in engineering and hopes to spread this movement across Africa and eventually the world.

Originally from South Sudan, the newest country in the world, Moses wants to open the first polytechnic school to teach people how to build with local materials in his home country.

Moses had to make up his mind to become an architect.

His architectural education was frequently interrupted by the civil war in his country.

As he was applying to join the African Design Center, gunshots were heard in the background of the interview call.

But even in the midst of this civil war, Moses persists in the idea that architecture can serve as a bridge to reconnect communities.

We should be inspired by this fellow's belief that great architecture can make a difference in how we build the future of Africa.

Africa's unprecedented growth cannot be ignored.

Imagine the cities of the future in Africa. It's not like a sprawling slum, though, it's the most resilient and most socially inclusive place on the planet.

This is achievable.

And we have the talent to make it a reality.

But the road to preparing that talent for the work ahead, as well as my own journey, is too long.

We need to shorten and streamline that journey for the next generation of African creative leaders.

But most importantly, we cannot stress this enough, we need to increase their confidence in their designs and enable them to develop truly African yet globally inspiring solutions.

thank you very much.

(applause)

I am really excited to be here today.

I'm going to show you some things that are literally ready to come out of the lab. And I'm really happy that you guys get to see it first hand. Because I really think this is going to really change the way we interact with machines from now on.

Well, this is a rear projection drafting table.

It's about 36 inches wide and has a multi-touch sensor.

Regular touch sensors, such as those found in kiosks and interactive whiteboards, can only register one contact point at a time.

This allows you to have multiple points at once.

They can use both my hands. You can use code actions. If necessary, you can immediately go up and use all 10 fingers.

That's right.

Now, multi-touch sensing is nothing new.

People like Bill Buxton tried it in the 80's.

However, the approach I've built here is actually high resolution, low cost, and perhaps most importantly, very scalable.

That said, the technology isn't the most exciting thing right now, except maybe its newfound accessibility.

What's really interesting here is what you can do with it and what kind of interfaces you can build on top of it.

For example, here is a lava lamp application.

As you can see, you can use both hands to squeeze the clumps together.

You can inject heat into the system here or pull it apart with two fingers.

It's completely intuitive. No instruction manual.

It started as a screensaver app created by one of our PhDs. Made by a student in our lab, Ilya Rosenberg.

The beauty of a multi-touch sensor is that you can do this with the same number of fingers here, but of course multi-touch inherently means multi-user as well.

While I'm playing here, Chris could be interacting with another part of Lava.

Imagine a new kind of engraving tool. It's like heating something to make it flexible and then cooling it to solidify it in a certain state.

Google's lobby should have something like this.

(Laughter) Once this loads, here's a more concrete example.

This is a lightbox application for photographers.

Again, you can use both hands to manipulate and move your photos.

But even better, with two fingers, you can actually grab a photo and stretch it out with ease.

You can easily pan, zoom and rotate.

You can do it thoroughly with both hands, or you can do it with two fingers on each hand.

You can do the same thing by grabbing the canvas. In other words, it stretches the canvas.

You can push this while grabbing the other and stretching it at the same time.

Again the interface disappears.

No manual.

This is exactly what you'd expect, especially if you've never worked with a computer before.

Now, with an effort like a $100 laptop, the idea of ​​ushering in a whole new generation of computing with this standard mouse and window pointer interface makes me a little sick.

I believe that this is how we should face machines in the future.

(Applause) Now, of course, you can bring up the keyboard.

(Laughter) You can carry it around and leave it there.

Obviously, this is a standard keyboard, but of course you can resize it to fit your hand.

This is very important. Because in this day and age there is no reason why physical devices need to be compliant.

It leads to bad things like RSI.

We have so much technology today that these interfaces should start to fit us too.

From this point on, very little can be applied to actually improve the way you interact with the interface.

This keyboard could actually be really going the wrong way.

Imagine if in the future we develop this kind of technology, we'll develop a keyboard that automatically drifts when you let go and is really smart at predicting which key you're going to press.

So -- again, isn't this great?

(laughter) Audience: Where is the lab?

Jeff Han: I'm a research fellow at New York University.

Here's an example of another kind of app: You can make a small pill like this.

It remembers the strokes I make.

It is pressure sensitive.

The cool thing about this is that it shows how a two-finger gesture zooms in very quickly.

No need to switch to manual or magnifying glass tools, so you can continuously create real-world multiple scales at the same time.

You can make a big one here, but you can also quickly return to the starting point and make an even smaller one here.

This becomes very important when you start working on things like data visualization.

For example, I think we all enjoyed Hans Rosling's lecture. And he was really emphasizing a fact that I've been thinking about for a long time, that we have all this great data and for some reason it's just sitting there.

One of the reasons I think of it is that it's aided by graphics and visualizations and reasoning tools, etc., but I also think a big part of that is having a better interface that allows you to drill into this kind of data while thinking about the big picture.

Let me introduce another app here. This is called the world wind.

It's done by NASA.

We've all seen Google Earth. This is its open source version.

There are plugins that allow you to load various data sets that NASA has collected over the years.

As you can see, you can use the same two-finger gesture to move down and in very seamlessly.

Anyone can really participate. And I get the expected result.

You can switch between different data views.

NASA is really amazing.

Because these hyperspectral images are false-colored, they are well suited for determining plant utilization.

Now let's get back to it.

The beauty of mapping applications is that they are actually 3D instead of 2D.

So again, with a multipoint interface, you can do gestures like this -- which means you can tilt like that -- (surprised laughter) It's not just limited to some kind of 2D panning and motion.

This gesture simply puts two fingers down. This defines the tilt axis and that way you can tilt up or down.

We just came up with it on the fly, so it's probably not the right way to do it, but you can do some very interesting things with this interface.

It's also a lot of fun to play with.

(Laughter) So the last thing I want to show you is I think there are a lot of entertainment apps that you can do with this.

I'm more interested in the creative applications I can do with this.

Now, here is a simple application example. You can draw curves.

And when you close it, it becomes a character.

But the nice thing is that you can add control points.

And all I can do is operate them with both fingers at the same time.

And then you realize what it does.

It's kind of like a puppet show where you can use as many fingers as you want to draw and create. There is actually a lot of computation going on here to control this mesh so that it behaves properly.

This technique where you can manipulate meshes with multiple control points is really state of the art.

It was announced at last year's SIGGRAPH.

This is a great example of the kind of research I really like. All the computational power to make things right, intuitive, and do what you expect them to do.

Multi-touch interaction research is currently a very active area in HCI.

I'm not the only one doing it, many others are working on it.

This kind of technology will make it accessible to more people. I look forward to interacting with you all over the next few days and seeing how it applies to your respective areas.

thank you.

How do we feed the city?

That is one of the big questions of our time.

But that is rarely heard.

We take it for granted that if we walk into a shop, restaurant, or indeed the foyer of this theater for an hour or so, there will be food waiting for us that magically comes from nowhere.

But given that in a city the size of London, enough food must be produced, transported, bought and sold, cooked, eaten and disposed of every day, and the same must happen every day in every city on earth, it is remarkable that the city is utterly fed.

We live in a place like this as if it were the most natural thing in the world, forgetting that we are animals and need to eat so we are actually as dependent on the natural world as our ancient ancestors were.

And as our urban migration increases, more and more of the natural world is turning to feed us with stunning landscapes like the one behind me—the soybean fields in Mato Grosso, Brazil.

These are extraordinary landscapes, but few people can actually see them.

And not only are these landscapes increasingly nourishing us.

As more of us move to cities, more people eat meat, and as a result, one-third of the world's annual grain harvest is fed to animals rather than us humans.

And given that it takes three times as much grain to feed a human being, in fact ten times as much, if it goes through animals first, it's not a very efficient way to feed us.

And it's also a growing problem.

It is estimated that by 2050, twice as many of us will live in cities.

It is also estimated that meat and dairy consumption will double.

So meat and urbanism are rising hand in hand.

And it will cause big problems.

By 2050, we have to feed 6 billion starving carnivores.

That's a big problem. And the truth is, if we go on like this, it's a very unlikely problem to solve.

Nineteen million hectares of rainforest are lost each year to make way for new arable land.

But at the same time, we are losing the same amount of existing arable land to salinization and erosion.

We are hungry for fossil fuels too.

About 10 calories are needed to produce all the calories in the food we consume in the West.

And even though there are foods that we spend a lot of money producing, we don't really care about them.

Currently, half of the food produced in the United States is wasted.

And to end all of this, we are not even able to properly feed the planet at the end of this long process.

One billion of us are obese, but another billion are hungry.

None of it makes much sense.

And considering that 80 percent of the world's food trade is now controlled by just five multinationals, it's a dire situation.

As we move into cities, the world is also embracing western diets.

And looking to the future, it becomes an unsustainable diet.

So how did you get here?

And more importantly, what are we going to do about it?

First, to answer a little simple question, we can say that this process began about 10,000 years ago in the ancient Near East, known as the Fertile Crescent.

As you can see, it was crescent shaped.

It was also fertile.

And about 10,000 years ago, two extraordinary inventions happened here, almost simultaneously, in the same place: agriculture and urbanism.

This is no coincidence, as agriculture and cities are linked. they need each other.

Because the discovery of the first grains by our ancient ancestors provided a sufficient and stable food source to support settlement.

And if you look at what those settlements were like, you can see that they were compact.

They were surrounded by productive farmlands and dominated by large temple complexes like this one at Ur. In fact, it was, in effect, a spiritualized central food distribution center.

For it was the temple that organized the harvest, gathered the grain and offered it to God, and returned to the people the grain that God did not eat.

In other words, the entire mental and physical life of these cities was governed by the grains and harvests that underpinned them.

And in fact, it applies to any ancient city.

But, of course, not all of them are so small.

Famously, by the first century AD, Rome had a population of about one million.

So how did such a city feed itself?

The answer is what I call the "Ancient Food Mile".

Basically, Rome had access to the sea, so it was possible to import food from very far away places.

In the ancient world this was the only way. It was very difficult to transport food over bumpy roads.

And the food apparently ran out quickly.

So Rome effectively waged war on places like Carthage and Egypt just to seize its grain reserves.

And indeed, the expansion of the empire was in fact something of a long-term militarized shopping district.

(Laughter) As a matter of fact, I love this fact, but let me just say that Rome was actually importing oysters from London at some stage. I think that's unusual.

That is why Rome shaped its hinterland with appetite.

But what's interesting is that another thing happened in the pre-industrial world as well.

If you look at a 17th-century map of London, you can see that London's grain, flowing from the River Thames, extends along the bottom of the map.

Grain markets were therefore located south of the city.

And the road from there to Cheapside, the main market, was also a grain market.

And the name of one of those streets, Bled Street, tells you what happened there 300 years ago.

And of course the same was true of the fish.

Of course, fish come in from the river. Same.

And, of course, Billingsgate is famous as London's fish market, which operated here until the mid-1980s.

It's really amazing when you think about it.

Everyone else was walking around with cell phones that looked like bricks, and things like stinky fish were going on in the harbor.

Again, this is true of urban food, but once it takes root in a city, it rarely moves.

Of course, it's a completely different story for meat, as animals can invade the city.

Much of the meat in London came from the North West, Scotland and Wales.

So it came in and arrived in the northwestern city. That is why Smithfield, London's very famous meat market, was there.

Poultry were coming in from East Anglia and elsewhere in the northeast.

Doing this makes me feel a bit like a weather girl. Anyway, the birds came in with little canvas shoes to protect their feet.

And once it reached the eastern end of Cheapside, it was sold there, hence the name chicken.

And indeed, if you look at a map of a city built before the industrial age, you can trace the food flow into it.

Reading the street names gives a lot of clues as you can really see how they were physically shaped by the food.

Friday Street is where you went to buy fish on Fridays in your previous life.

But you also have to imagine being full of food.

The only places where food was bought and sold were the streets and public spaces.

A picture of Smithfield from 1830 shows how difficult it would have been to live in a city like this without knowing where the food came from.

In fact, if you were at lunch on Sunday, you might have been moaning or grunting outside your window about three days ago.

So this was clearly an organic city, part of an organic cycle.

And ten years later, everything changed.

This is an image of the Great Western in 1840.

As you can see, early train passengers included pigs and sheep.

So suddenly these animals are no longer on the market.

Somewhere in the countryside, they are slaughtered blind and unconscious.

And they are coming to the city by train.

And this changes everything.

First of all, this makes it possible for the first time to grow cities of virtually any size and shape, anywhere.

Cities used to be geographically constrained. People used to have to use very difficult physical means to get their food.

Suddenly they are virtually free from geography.

As you can see from these maps of London, in the 90 years since the trains came, London has gone from a small hunk that could easily feed animals and such on foot to a massive splurge that makes it very, very difficult to feed anyone, animal or human, on foot.

And of course, that was just the beginning. After the train comes the automobile, which indeed marks the end of this process.

It is the final liberation of the city from its apparent relationship with nature.

And here is a city where there is no smell, there is no confusion and there is no doubt that there are no people. Because no one would have dreamed of walking in such a landscape.

In fact, what they did to get food was they would drive to a box somewhere in the suburbs, buy a week's worth of shopping, come back, and figure out what the heck they were going to do with it.

And it is precisely this moment that completely changes our relationship to both food and the city.

Here, food, once the center of the city and the core of society, is on the fringes.

It used to be a social event where food was bought and sold.

You are anonymous now.

we were cooking. Now just add water. If you're making cakes, etc., add a little egg.

We don't smell food to see if it's okay to eat.

Just read the back of the label on the package.

And we don't value food. we don't trust it.

So instead of trusting it, we fear it.

And instead of cherishing it, they throw it away.

One of the great ironies of the modern food system is that what they promised to be easy, they have made much harder.

By allowing us to build cities anywhere and everywhere, they have actually distanced us from our most important relationship with nature.

Also, they have made us dependent on the as we have seen unsustainable systems that only they can provide.

So what do we do about it?

Not a new question.

Five hundred years ago, that was what Thomas More was asking himself.

This is the frontispiece of his book Utopia.

And it was a series of semi-independent city-states, as nostalgic as that might sound, within a day's walk of each other, where everyone was basically obsessed with farming, growing vegetables in backyards, eating communal meals together, and so on.

And I think you could also argue that food is a fundamental ordering principle of Utopia, even if Moa never framed it that way.

And this is another very famous "utopian" vision, Ebenezer Howard's "Garden City".

Same idea: a series of semi-independent city-states, small blobs of metropolitan areas with arable land around them, connected to each other by railroads.

And again, food can be said to be the ordering principle of his vision.

It was built, but it had nothing to do with this vision Howard had.

And that's the problem with these utopian ideas, that's what it means to be utopian.

Utopia is actually a word used deliberately by Thomas Moore.

It was kind of a joke, as it is doubly derived from Greek.

Sometimes it means a good place, sometimes it means no place.

Because it's ideal. it is imaginary. It can't be.

And I don't think it's very useful as a conceptual tool for thinking about the very deep question of human habitation.

So I came up with an alternative. It is Cytopia, derived from the ancient Greek words “citos” meaning food and “topos” meaning place.

I think we already live in Sitopia.

We live in a world shaped by food, and if we understand that, we can use food as a really powerful tool: a conceptual tool, a design tool, to shape the world differently.

So what would Cytopia look like if it did?

Well, I think it looks something like this.

I have to use this slide. It's just a dog's expression.

But anyway, this is -- (laughter) food is at the center of life, it's at the center of family life, it's celebrated, it's entertained, it's what people give time to.

This is how food should be in our society.

But without these people, this kind of scene wouldn't be possible.

By the way, it doesn't matter if you're a man.

It is the food thinker who thinks about food, thinks ahead, makes plans, can stare at a pile of raw vegetables and actually recognize it.

we need these people. We are part of a network.

A place like this wouldn't be possible without these people.

I chose this place because men buy vegetables here.

But the network, the market, where the food is grown locally.

it is common. Fresh, isn't it?

It is part of the social life of the city.

Because without it, you wouldn't have a place like this, food that's grown locally and part of the landscape, and zero-sum commodities like invisible hell.

Cows admiring the view.

A pile of sultry humus.

This is basically putting the whole thing together.

This is a community project in Toronto that I recently visited.

This is a greenhouse where children learn all about food and growing their own food.

Here is a plant named Kevin. Or maybe it's a plant owned by a kid named Kevin. don't know.

But in any case, projects of this kind that try to reconnect us with nature are very important.

So for me Sitopia is just one perspective.

It's basically recognizing that Sitopia is already in every little pocket.

The trick is to connect them: use food as a way to see.

Then we won't see cities like this as unproductive blobs of big cities.

We will see them in this way as part of a productive, organic framework of which they are inevitably part and symbiotically connected.

But, of course, this is also not a good image. Because we don't need to produce food like this anymore.

We need to think more about permaculture. So I think this image summarizes the thinking that we need to do.

It's a reconceptualization of how food shapes our lives.

The best image I know of this is from 650 years ago.

"Allegory of Good Government" by Ambrogio Lorenzetti.

It is about the relationship between the city and the countryside.

And I think this message is very clear.

If the city protects the country, the country will protect the city.

And now we ask ourselves, if Ambrogio Lorenzetti painted this image today, what would he paint?

What would the good government allegory look like today?

Because I think it's an urgent question.

That's what we have to ask and we have to start answering.

We know that what we eat determines who we are.

We need to realize that the world is also what we eat.

But if we embrace that idea, we can harness food as a really powerful tool to shape the world for the better.

thank you very much.

(applause)

What we really want to talk about here is "how".

So how do you create this world-shaking innovation?

Now, I would like to talk briefly.

Go back over a year.

In fact, that date -- I'd like to know if anyone knows what happened on this important date?

It was February 3, 2008.

Does anyone remember what happened on February 3rd, 2008?

super ball. I heard it over here. It was the day of the Super Bowl.

And the reason this date was so important is because when my colleagues John King and Haley Fisherwright and I started reporting on the various Super Bowl parties, it seemed to us that Tribal Councils were convening all over the country, so to speak.

And they discussed something of great national importance.

Like, "Do you like Budweiser commercials?"

and "Do you like nachos?" and "Who will win?"

But they also discussed which candidate they would endorse.

And when we went back in time to February 3rd, it looked like Hillary Clinton would win the Democratic nomination.

And there were even polls that she was going to last.

But when I talked to people, there seemed to be a funnel effect going on with these tribes across the United States.

So what are tribes? A tribe is a group of about 20 people, more than a team, from 20 to about 150 people.

And all our work is done within these tribes.

But it's not just about work. It is within these tribes that societies are built and important things happen.

So we surveyed the various Tribal Council delegates who had gathered for a meeting, also known as the Super Bowl Party, and the next day sent 40 newspaper editors an e-mail stating:

Posted on our website on February 4th. It was before Super Tuesday.

We said, "The tribe we're in says we're going to be Obama."

Now, the reason we know that is because we've spent the last decade studying tribes, groups that occur naturally.

You are part of a tribe.

While walking around during the break, many met members of their own tribes. and you were talking to them.

And many of you were doing the wonderful things that tribal leaders do. It's about finding a person who is a member of one tribe and finding and introducing another person who is another member of another tribe.

In fact, that is what great tribal leaders do.

The conclusion is:

If you were to focus on a group like this -- this happened to be a USC game -- and you zoomed in with one of the super satellite cameras and adjusted the magnification so you could see individual people, you wouldn't really see any crowds, just like there aren't any crowds here, but you would see tribes gathering together.

And from a distance it appears to be a single group.

And people form tribes.

they always do. they always will.

People form tribes like fish swim and birds fly. That's what we do.

But here's the problem.

Not all tribes are the same, it's the culture that makes the difference.

Well, here is the net.

You are part of a tribe.

If only you could find a way to take your tribe and move it forward along these tribal stages to the top of the mountain which we call Stage 5.

But we'll start with what's called Stage 1.

Now, this is the lowest stage.

You don't want this. have understood?

This is a bit of a difficult image to display on screen.

But that's what I think we need to learn.

Stage 1 produces people who do horrible things.

This is the boy who shot Virginia Tech.

Stage 1 is a group where people systematically disassociate from functional tribes and gather like-minded people.

Stage 1 is literally gang culture and prison culture.

Again, we won't cover Stage 1 much.

And I would argue that as members of society we need to do so.

Simply ignoring people is not enough.

But let's move on to Stage 2.

Now, in Stage 1, you'll find that you're effectively saying, "Life sucks."

So in the just-published book The Three Laws of Performance that Steve mentioned, my colleague Steve Zaffron and I argue that people act as they see the world.

Well, if people see the world in the worst way of life, their behavior will automatically follow suit.

It would be hopeless hostility.

They will do whatever it takes to survive, even if it means weakening other people.

Well, my birthday is coming up soon and my driver's license is about to expire.

And the reason this is important is because soon you'll be stepping into what we call the Stage 2 Tribe. This is something like:

(laughter) Now, am I saying that every DMO in the country has a Stage 2 culture?

No, but at a store near me I have to go in just a few days, but what I say when I'm in line is, "How are people still living being so stupid?"

(Laughter) Now, am I saying there are stupid people working here?

Not really.

But what I mean is that culture makes people stupid.

So in Stage 2 cultures, we see these in all sorts of different places, but really in the best organizations in the world.

You can find them everywhere in society.

I've met them in organizations that everyone raves about as being best in class.

But here's the point. If you believe and say to people in your tribe, in effect, "My life sucks.

I mean, if I could go to TEDx USC, my life wouldn't be so bad. But it's not. That's right. ”

Imagine what work would be done if you spoke like that.

What kind of innovation will be realized?

How many world-changing actions will happen?

In practice it will be basically zero.

Now, let's move on to Stage 3. This is the stage most familiar to many of us.

Because stage 3 is where most of us transition.

and we park. and we will remain.

Stage 3 says, "I'm great, but you're not."

(Laughter) I'm great, but you're not.

Now imagine a whole room of people, effectively saying, "I'm great, you're not."

Or, "I'm going to find a way to compete with you and come out on top."

Whole groups of people communicate like that and talk like that.

I know it sounds like a joke. Three doctors enter the bar.

But in this case, three doctors board the elevator.

I happened to be interviewing this book in an elevator.

And one doctor said to another doctor: "Did you see my article in the New England Journal of Medicine?"

And the other said, "No, that's great. Congratulations!"

The next patient, with a wry smile on his face, said: "While you were doing your research, I performed more surgeries than anyone else in the surgical department at this facility."—Notice the condescending tone.

And the third person gave a wry smile in the same way and said, “While you were doing research and doing meatball surgery on monkeys, we may not have to eventually train monkeys to do that surgery, or train cells or robots, or even do that, but I was running a future residency program, that’s just the future of medicine.”

And everyone laughed and patted him on the back.

Then the elevator door opened and everyone left.

It is a stage 3 tribal meeting.

Now you can find these in places where really smart and successful people congregate.

Oh I don't know, like TEDx USC.

(Laughter) This is the biggest challenge we face in innovation.

We are transitioning from stage 3 to stage 4.

Let's take a look at a quick video snippet.

This is from a company called Zappos in the suburbs of Las Vegas.

My question on the other side would be, "What do you think they value?"

It wasn't Christmas time. We had a Christmas tree.

This is their lobby.

Employees volunteer at the advice booth.

Notice how it looks like something out of the Peanuts cartoon.

Now, let's go through the corridors of Zappos here.

This is a call center. Notice how it is decorated.

Notice people applauding us.

They don't know who we are and they don't care. And even if they did, they probably wouldn't applaud.

But you will notice the level of excitement.

Again, notice how they decorate their office.

Now, what matters to Zappos employees may not matter to you.

But they value fun and things like that. And they value creativity.

One of their values ​​is to "be a little different".

And you'll find them a little strange.

So when individuals come together and find something that unites them beyond their individual capabilities, something very important happens.

The group gels. And it shifts from a highly motivated but highly individualized group of people to something larger, a self-aware tribe.

Stage 4 tribes can do amazing things.

But you will notice that we are not yet at the top of the mountain.

Actually, there is another step.

Now, some of you may not recognize the scene here.

And if you look at the Stage 5 headline "Life is Wonderful", this might feel a little out of place.

This is a scene or fragment of the truth and reconciliation process in South Africa where Desmond Tutu was awarded the Nobel Prize.

Now let's think about it. In South Africa, horrific atrocities were taking place in society.

And people came together focused on just two values: truth and reconciliation.

There were no road maps. No one has ever done something like this before.

And in this atmosphere, guided only by people's values ​​and a higher cause, what this group has achieved is historic.

And people at the time feared that South Africa would follow in Rwanda's footsteps, descending into skirmish after skirmish in a seemingly endless civil war.

In fact, South Africa has not gone that route.

That's largely because people like Desmond Tutu have set up a fifth-stage process that involves thousands, perhaps millions, of tribes across the country to bring them all together.

So people hear this and, like us who did the research, conclude:

got it. I don't want to talk about Stage 1.

It's like, you know, "life sucks." who wants to talk like that?

I don't want to talk like they do at a particular DMV near where Dave lives.

I don't want to just say "I'm great". You sound narcissistic when you say things like that and you lose friends.

"We are great" sounds like a good thing.

But we should really be talking about Stage 5, right? "Life is great."

In fact, there are three somewhat counterintuitive findings that come from all this.

First, when you look at and actually read the Declaration of Independence, the words that stick out in the minds of many people are about non-negotiable rights.

I mean, it's stage 5, right? Life is wonderful, and it is directed only by our values, not by other guiding principles.

In fact, most of the document was written in the second stage.

"My life sucks because I live under a tyrant, also known as King George.

we are awesome! who isn't great? England! "

sorry. (Laughter) So what about other great leaders? What about Gandhi?

What about Martin Luther King?

After all, it's all people preaching that "life is beautiful," right?

A little bit of happiness and joy comes one after another.

In fact, Martin Luther King's most famous line was during the third stage.

He didn't say, "We have a dream." "I have a dream," he said.

why did he do that Because most people don't reach stage 5.

2% are in Stage 1.

About 25% are in stage two, effectively saying, "My life sucks."

48 percent of working tribes say they are an employed tribe and say, "I'm great, but you're not."

And we have to fight it every day, so we turn to politics.

Only about 22 percent of tribes are in Stage 4 saying “We are great” according to our values.

And our values ​​are starting to unite us. ”

Only 2% of the tribe can reach Stage 5, and only 2%.

And they are the ones that change the world.

The first small finding from here is that leaders need to be able to speak at all levels so they can influence everyone in society.

But don't leave them where you find them. have understood?

Tribes can only hear one level above and one level below where they are.

So we have to have the ability to talk about all levels and go where they are.

And the leader takes people within the tribe to the next level.

I would like to introduce some examples.

One of the people we interviewed was former San Francisco mayor Frank Jordan. Prior to that, he was the San Francisco Police Chief.

And he basically grew up in Stage 1.

And do you know what changed his life? I had just stepped into one of them, the Boys and Girls Club.

Well, here's what happened to the man who eventually became mayor of San Francisco.

He went from being lively and passionate on the first stage - "Life sucks, hopeless animosity, I'll do whatever it takes to survive" - ​​to entering a boys and girls club, sitting on a chair with his arms crossed and saying,

no one knows.

I mean, if I was into boxing like they were, my life wouldn't be boring. But it's not. That's right.

So I'm going to sit here in my chair and do nothing. ”

In fact, it's progress.

We move people from Stage 1 to Stage 2 by welcoming them into new tribes and connecting them over time.

So what happens when you move from Stage 3 to Stage 4?

We want to claim that we are doing it here.

TED represents a set of values, and as we come together around these values, really interesting things start to emerge.

If you want to keep this experience historically alive, I would encourage you at tonight's reception to do something beyond what people normally do and call it networking.

It's not just about meeting new people to expand your reach and expand your influence, but about finding people you don't know and finding and introducing people you don't know.

This is called a ternary relation.

See, the guys building the tribes that change the world are doing it.

They broaden their reach and increase my following by uniting tribes, not just me, but I unite people who don't know each other to something bigger than themselves.

And ultimately it increases their values.

But we're not done yet. So how do you get from the great stage 4 to stage 5?

My last favorite story is this one. It comes out of a place called the Gallup Organization.

You know they do polls, right?

So it's stage 4. we are great who isn't great?

Almost everyone else who does polls.

If Gallup released the poll on the same day that NBC released the poll, people would pay attention to the Gallup poll. Ok, that's ok.

So they were bored.

They wanted to change the world. So here is the question someone asked.

“Rather than just looking at what Asia thinks, or what the US thinks, or who thinks Obama vs. McCain or whatever, how can we say what the whole world thinks?”

And they found a way to do the first-ever world poll.

They included a Nobel laureate in economics, who reported being bored.

And suddenly they got out a piece of paper and tried to figure out, 'How do we study the population of Sub-Saharan Africa?

How do we investigate people who don't have access to technology, who speak languages ​​we don't speak, and who don't know anyone who speaks those languages? Because to accomplish this great mission, you must be able to do it.

By the way, they pulled it off.

And they released the first-ever world poll.

So, I would like to leave this impression.

First of all, we all form tribes.

You belong to this tribe. Hopefully you can expand the range of tribes you have.

But the question on the table is this: What kind of impact does the tribe you're a part of have?

You often hear presentation after presentation representing groups and tribes of people about how they changed the world.

If you practice what we've been talking about, you'll be listening to how people in your own tribe actually communicate.

And don't leave them alone. you drive them forward.

Don't forget to talk about all five cultural stages.

Because we have all five people around us.

And the question I want to leave you with is this: Will your tribe change the world?

thank you very much.

(applause)

I am a storyteller.

And I want to give you some personal stories about what I call "the perils of a single story."

I grew up on a university campus in eastern Nigeria.

My mother said I started reading at the age of 2, but I think 4 is probably closer to the truth.

So I am a reader and what I read was British and American children's books.

I was also in my early days as a writer, and when I was about seven years old, when I started writing stories with pencil illustrations of crayons that my poor mother was obligated to read, I wrote exactly the kind of stories I read. The characters were all white with blue eyes, played in the snow, ate apples (laughs), and talked a lot about the weather and how nice it was to see the sun come out.

(Laughter) Well, this is despite the fact that I used to live in Nigeria.

I had never been outside Nigeria.

It didn't snow, I ate mangoes, and I didn't need to talk about the weather, so I didn't talk about it.

The characters in the British books I read also drank ginger beer, so they also drank a lot of ginger beer.

It's okay if you never knew what ginger beer was.

(Laughter) And in the years that followed, I had a burning desire to taste ginger beer.

But that's another story.

I think this shows how sensitive and vulnerable we are when confronted with stories, especially as children.

Having read so many books with foreigners in them, I was convinced that the books, by their very nature, had foreigners in them, and that they must be about things that I personally could not relate to.

Well, things changed when I found the African book.

The number of books was small, and it was not as easy to find as foreign books.

But thanks to writers like Chinua Achebe and Kamala Ray, I experienced a spiritual shift in how I viewed literature.

I realized that curly-haired girls like me, with chocolate-colored skin who can't wear ponytails, can also exist in literature.

I started writing about what I noticed.

Well, I loved the American and British books I read.

They captured my imagination. They opened a new world for me.

But as an unintended consequence, I didn't know that someone like me could exist in literature.

So what the discovery of African writers has done for me is that it has saved me from having a single story about what a book is.

I come from a middle class traditional Nigerian family.

My father was a professor.

my mother was an administrator.

Therefore, as a matter of course, we had live-in helpers who often came from nearby rural villages.

So the year I turned eight, a new houseboy came.

His name was Fide.

The only thing my mother told us about him was that his family was very poor.

My mother sent yams and rice and our old clothes to his family.

And when I hadn't finished dinner, my mother used to say, "Finish your meal! Don't you know? People like Fide's family don't have anything."

So I felt very sorry for Fide's family.

Then one Saturday we visited his village. There his mother showed us a beautifully patterned basket made of dyed raffia made by his brother.

I was surprised.

It never occurred to me that someone in his family could actually build something.

All I had heard about them was how poor they were, and I could only see them as poor.

Their poverty was my only story about them.

I thought about this a few years later when I left Nigeria to attend university in the United States.

i was 19 years old.

My American roommate was shocked by me.

She asked me where I learned to speak English so well and was puzzled when I told her that Nigeria happens to be the official language.

She asked if she could listen to what I called "tribal music," so I was very disappointed when I produced the Mariah Carey tape.

(Laughter) She thought I didn't know how to use the stove.

What struck me was that she felt sorry for me even before she saw me.

Her default attitude towards me as an African was a kind of condescending, benevolent sympathy.

My roommate had a single story about Africa — a single story of catastrophe.

In this single story, there was no possibility that Africans resembled her, no possibility of having more complex emotions than pity, no possibility of being on equal terms as humans.

I have to say, I didn't consciously identify as African before I went to America.

But in America, whenever we talked about Africa, people looked to me.

It's okay if you knew nothing about a place like Namibia.

However, I have come to accept this new identity and now consider myself African in many ways.

I still get very annoyed when I call Africa a country, but the most recent example was two days ago on a fantastic flight out of Lagos, when an announcement was made on board Virgin about charity work in "India, Africa and other countries."

(Laughter) So after spending a few years in America as an African, I started to understand my roommate's reaction to me.

If I hadn't grown up in Nigeria, and had only a general image of Africa, I would also think of Africa as a place of beautiful landscapes, beautiful animals, and people I don't understand, fighting senseless wars, dying of poverty and AIDS, unable to speak for themselves, waiting to be rescued by kind white foreigners.

I see Africans the way I saw Fide's family when I was a kid.

I think this single story about Africa ultimately comes from Western literature.

Here is a quote from an article written by a London merchant named John Locke. He sailed to West Africa in 1561 and left an interesting account of his voyage.

After calling black Africans "homeless beasts," he writes, "They too are headless people with mouths and eyes in their bosoms."

Now I laugh every time I read this.

And you must admire John Locke's imagination.

But what is important about his writing is that it represents the beginning of the tradition of telling African stories in the West. It is the tradition of sub-Saharan Africa as a place of negativity, difference, darkness and people who, in the words of the great poet Rudyard Kipling, are "half demons, half children".

So I began to realize that my American roommate must have also seen and heard different versions of this single story throughout his life. So did a professor who once told me that my novels were not "genuinely African."

Now, although I actively argued that the novel had many mistakes and failed in many places, I never imagined that it would fail to achieve what is called African authenticity.

In fact, I had no idea what African authenticity was.

The professor said my character was too much like him, an educated middle class.

My character drove a car.

they were not hungry.

Therefore, they were not true Africans.

But I must quickly add that I am guilty as well when it comes to this single narrative matter.

A few years ago I visited Mexico from the US.

The political climate in the United States was tense at the time, and immigration was being debated.

And, as is often the case in America, immigrants have become synonymous with Mexicans.

Stories of Mexicans fleeing the health system, sneaking across the border, and being arrested at the border continued.

On my first day in Guadalajara, I remember walking around watching people go to work, rolling tortillas in the market, smoking cigarettes and laughing.

I remember being a little surprised at first.

And I was overwhelmed with embarrassment.

I was so immersed in the media coverage of Mexicans that I realized they had become one thing in my mind: 'bad immigrants'.

I believed in a single Mexican story and I couldn't be more ashamed of myself.

This is how you create a single story and make people appear as the single, the only, over and over again, that's what they become.

It is impossible to tell a single story without telling power.

There is a word Igbo that comes to mind whenever I think of the power structures of the world. It is "Nkari".

This is a noun that roughly means "better than others".

Like our economic and political worlds, narratives are defined by Nukali principles. So how the story is told, who is telling it, when it is being told, how many stories are being told really depends on power.

Power is the ability not only to tell someone else's story, but to make it that person's defining story.

Palestinian poet Mourid Barghouti wrote that if you want to strip people of their people, the easiest way to do so is to tell their story and start "second."

If you start your story with Native American arrows instead of the arrival of the English, you get a whole different story.

If you start the story with the failure of an African state instead of the colonization of an African state, you get a very different story.

Speaking at a university recently, a student told me that it was very unfortunate that a Nigerian man was a physical abuser like the father in my novel.

I told him I had just read a novel called "American Psycho" -- (laughter) -- and said it was a great shame that young Americans are serial killers.

(Laughter) (Applause) Well, obviously I said this with a bit of annoyance.

(Laughter.) But just because I read a novel where the character is a serial killer, it never occurred to me that that character somehow represented all Americans.

This was not because I was better than the student, but because of America's cultural and economic power, I had a lot to say about America.

I was reading Tyler and Updike, Steinbeck and Gateskill.

There was no mention of America.

A few years ago, when I learned that being a successful writer required having a really unhappy childhood, I started thinking about how I could fabricate the horrible things my parents did to me.

(Laughter) But the truth is, I had a very happy childhood full of laughter and love in a very close-knit family.

But I also had a grandfather who died in a refugee camp.

My cousin Polle died due to lack of proper medical care.

One of my close friends, Okoloma, died in a plane crash because there was no water in the fire engine.

I grew up under a repressive military regime that neglected education, so my parents were sometimes not paid.

So when I was a kid, I saw jam disappear from the breakfast table, margarine disappear, bread became more expensive and milk rationed.

And most of all, a kind of normalized political terror has invaded our lives.

All these stories shape me.

But claiming only these negative stories flattens my experience and ignores the many other stories that shaped me.

A single story creates a stereotype, but the problem with the stereotype is not that it's not true, it's that it's incomplete.

One story becomes the only story.

Of course, Africa is a continent full of catastrophes. Some are unfathomable tragedies like the horrific rape in Congo, while others are depressing, with 5,000 people applying for a single job in Nigeria.

But there are also stories other than catastrophes, and it's very important, just as important, to talk about them.

I have always felt that it was impossible to properly engage with a place or person without engaging with the whole story of the place and person.

Here are the results for this single story: It robs people of their dignity.

It makes it difficult for us to recognize equal humanity.

Emphasize how we are different rather than how we are alike.

So what if you followed the immigration debate from both the U.S. and Mexican sides before your trip to Mexico?

What if my mother had told us that Fide's family was poor and hardworking?

What if there was an African television network that broadcast stories from Africa around the world?

Nigerian author Chinua Achebe calls it "narrative balance."

What if my roommate knew about Nigerian publisher Mukhtar Bakare, an amazing guy who quit banking to start a publishing company to pursue his dreams?

Well, the conventional wisdom is that Nigerians don't read literature.

he did not agree.

He felt that if literature was made affordable, people who could read it would read it.

Shortly after he published my first novel, I went to a TV station in Lagos for an interview, and a woman who worked there as a messenger came up to me and said:

Well, I have to write a sequel, and this is going to happen..."

(Laughter.) And she went on to tell me what to write in the sequel.

Not only was I fascinated, I was very impressed.

Here was a woman who was part of the Nigerian general public who was never supposed to be a reader.

Not only did she read the book, she owned it and felt right to tell me what to write in the sequel.

Now, what if my roommate knew about my friend Hummi Iyanda? She is a TV host from Lagos, a fearless woman determined to tell stories we would rather forget.

What if your roommate knew about the heart surgery you had last week in a hospital in Lagos?

What if my roommate knew about the contemporary Nigerian music of Ibo, Yoruba and Ijo, with talented people singing in English and Pidgin, mixing influences from Jay-Z to Fela to Bob Marley and their grandfather.

What if your roommate knew about a female lawyer who recently appeared in court in Nigeria to challenge a ridiculous law that says women must get their husbands' consent before renewing their passports?

What if my roommate knew about Nollywood? Nollywood has a lot of innovative people making movies despite great technical difficulties. Movies are hugely popular and are the best example of how Nigerians consume what they make.

What if my roommate found out about my wonderfully ambitious hair braider who had just started his own business selling hair extensions?

Or the millions of other Nigerians who start and fail but remain ambitious?

Every time I go home, I face the usual source of irritation for most Nigerians. It faces not only failed infrastructure, failed governments, but also the incredible resilience of people who thrive not because of government, but in spite of government.

Every summer I teach a writing workshop in Lagos and I am amazed at how many people apply and how many people are passionate about writing and telling stories.

A Nigerian publisher and I just started a non-profit organization called the Farafina Trust. We have big dreams of building libraries, renovating existing libraries, providing books to state schools that have nothing in their libraries, and holding lots of literacy workshops for all who want to tell our many stories.

Story is important.

Many stories matter.

Stories have been used to rob and vilify, but they can also be used to empower and humanize.

Stories can hurt people's dignity, but stories can also repair that broken dignity.

American author Alice Walker wrote of her southern relatives who migrated to the North:

She introduced them to a book about life in the South that they left behind.

"They were sitting around, reading to themselves, listening to me reading, and a kind of paradise was restored."

I would like to end with this thought. When we reject a single story, when we realize that there is never a single story about any place, we reclaim a kind of paradise.

thank you.

(applause)

I would like to start with the game. have understood?

And to win this game, all you have to do is see the reality in front of you as it is, right?

Here we have two panels of colored dots.

And one of those dots is the same in the two panels.

And please tell me which one.

Well, we've narrowed it down to three: gray, green, and orange.

So let's raise our hands and start with the easiest.

Hands up: How many of you think it's the gray one?

TRUE? have understood.

How many people think it's green?

And how many people would think it was orange?

It's pretty evenly split.

Let's find out what the reality is.

Here is the orange one.

(Laughter) This is the green one.

And these are grey.

(Laughter.) I mean, you guys watching this are complete realists.

(Laughs) This is pretty amazing.

Because almost all living systems have evolved some form of the ability to detect light.

So for us, seeing colors is one of the simplest things our brains do.

But even at this most basic level, context is everything.

What I'm going to talk about is not that context is everything, but why context is everything.

Because it answers questions that tell us not just why we do what we do, but who we are as individuals and as a society.

But before that, we need to ask another question: what is color for?

And instead of telling you, let me just show you.

Shown here is a jungle scene where surfaces appear depending on how much light they reflect.

Now, does anyone see a predator trying to leap at you?

If you haven't seen it yet, you're dead, right?

(Laughter) Anyone see it? Who? no?

Now let's look at the surface according to the quality of light it reflects.

And now we see it.

Color therefore allows us to see similarities and differences between surfaces, depending on the full spectrum of light they reflect.

But what you just did is in many ways mathematically impossible.

why?

Because, as Berkeley puts it, we have no direct access to the physical world except through our senses.

And the light that hits our eyes is determined by multiple factors in the world, including not only the color of objects, but also the color of their lighting, and the color of the space between us and those objects.

Changing any of these parameters will change the color of the light hitting the eye.

This is a big problem because it means that there can be an infinite number of real-world sources for the same image.

Tell me what you mean

These are two predictions from the world.

They are identical in every respect.

They are identical in shape, size and spectral content.

As far as your eyes are concerned they are the same.

But they come from completely different sources.

The one on the right is from the shadowy yellow surface facing left, viewed through a pinkish medium.

The photo on the left shows the orange surface under direct light, looking to the right and through a bluish medium.

Exactly the same retinal information arises with an entirely different meaning.

Still, all we get is retinal information.

So how can we see things?

So if this next 18 minutes reminds you of anything, keep this in mind. The light that hits the eye, the sensory information, is irrelevant. Because it can literally mean anything.

And what is true for sensory information is also true for general information.

Information has no intrinsic meaning.

What matters is what you do with that information.

So how do we see it? Yes, we see by learning to see.

By interacting with the world, the brain has evolved mechanisms to find patterns, find relationships within information, and associate those relationships with the meaning and importance of actions.

We are very much aware of this in the form of more cognitive attributes such as language.

I'm going to pass some strings, and I'd like it to be read aloud if possible.

Audience: “Can you read this?”

"You are not reading this."

"What are you reading?"

Bo Lott: "What are you reading?" Half the letters are gone, right?

There is no a priori reason why 'H' must fall between 'W' and 'A'.

But you put one in there. why?

Because the statistics of your past experience have been beneficial to do so.

And yet you didn't put a letter after the first "T".

why? Because it was useless in the past.

So please don't do it again.

So let's show how quickly our brain can redefine normalcy for even the simplest action of color.

So if you could turn off the lights here.

The first thing to notice is that these two desert scenes are physically identical.

One simply inverts the other.

Now look at the dot between green and red.

And I want you to look at that. Look nowhere else.

We're going to look at it for about 30 seconds, which is a small amount of time in an 18 minute talk.

(laughs) But I really want you to learn.

And I tell you -- don't look anywhere else -- tell me what's going on in your head.

Your brain is learning and learning that the right side of your field of vision is under red light. The left side of the field of view is under green illumination.

That is learning. have understood?

Now, when I tell this story, I want you to focus on the point between the two desert scenes.

So why not do it now?

(laughs) Can I turn on the lights again?

From your response, they don't look the same anymore, do they?

(Applause.) Why? Because your brain perceives the same information as if the right information is still under the red light and the left information is still under the green light.

have understood? So what does this mean in context?

In other words, if you take two identical squares and place them in a bright surround and a dark surround, the square in the dark surround will appear lighter than the one in the light surround.

It's not just the brightness of the surroundings that matters.

It is those light and dark environments that gave meaning to your actions in the past.

So let me explain what I mean.

Exactly the same illusion here.

There are two identical tiles on the left, one with a dark surrounding and one with a light surrounding.

And the same on the right side.

I'm about to publish these two scenes, but I'm not going to change anything inside these boxes except what they mean.

And see what happens to your perception.

Notice how the two tiles on the left look almost completely opposite. One is very white and the other is very dark.

On the right, however, the two tiles look nearly identical.

Yet there is still one in the dark environment and one in the bright environment.

why?

Because if that shadow tile is actually in the shadow and reflects the same amount of light to the eye as the tiles outside the shadow, then by the laws of physics it should reflect more.

It looks like that.

On the right, on the other hand, the information matches two tiles under the same light.

If placed under the same light and reflecting the same amount of light to the eye, they should reflect the same.

It looks like that.

What this means is that all this information can be combined to create incredibly powerful illusions.

This is one I made a few years ago.

And you can see that it has dark brown tiles on top and bright orange tiles on the sides.

That is your perceived reality.

In physical reality, these two tiles are the same.

Here you will see 4 gray tiles on the left and 7 gray tiles on the right.

I'm not going to change these tiles at all, but I'm going to expose the rest of the scene.

And see what happens to your perception.

The four blue tiles on the left are gray.

The seven yellow tiles on the right are also gray.

They are the same. have understood?

can't believe it? Let's look at it again.

What is true for color is also true for the complex perception of motion.

Now, here - let's change the subject - there are diamonds.

And what I'm trying to do is hold it here and rotate it.

And you can probably see it moving in this direction as well.

Now, I would like you to continue watching.

Move your eyes, blink, or close one eye.

Then suddenly it flips over and starts spinning in the opposite direction.

yes? Raise your hand if you understand. yes?

It keeps flashing.

So I would like to ask, in which direction is it rotating?

how do you know?

Your brain doesn't know because both possibilities are equal.

So depending on where it appears it switches between the two possibilities.

Are we the only ones seeing illusions?

The answer to this question is no.

Even the beautiful bumblebee, which has only a million brain cells, which is 250 times less than in a single human retina, sees illusions and does the most complex things that even our most sophisticated computers cannot.

My laboratory is working on research on bumblebees. Because you have full control over the bumblebee's experience and can observe how it changes the structure of the bumblebee's brain.

There is a nest here.

You can see the queen bee which is a big bee in the middle.

These are her daughters - eggs.

They travel back and forth between this nest and the arena via this tube.

You can see a single bee coming out of here.

Can you see that she has a small number?

Another one comes out, she also has a number.

Well, they weren't born that way, were they?

They fall asleep when we take them out and put them in the fridge.

Then attach the small numbers with superglue.

(Laughter) And in this experiment, if you go to a blue flower, you get a reward.

They perch on flowers, stick their tongues into them, called proboscis, and drink sugar water.

She's drinking that much water for you and me. Repeat 3 times and then fly.

And sometimes they learn to go where other bees go instead of going to the blue sky.

So they copy each other.

And here she comes down the ladder.

And she comes to the hive, finds an empty honey urn and vomits, and it's honey.

(Laughter) Remember, she's supposed to go to the blue flower, but what's the bee doing in the top right corner?

It looks like it has green flowers.

Now, are they misunderstanding?

And the answer to your question is no. It's actually a blue flower.

But they are blue flowers under green light.

So they solve puzzles using the relationships between colors, which is exactly what we do.

That is why illusions are often used, especially in art, "to show the fragility of our senses," in the words of more modern artists.

Now this is complete garbage.

Senses are not fragile. If so, we wouldn't be here.

Instead, colors tell us something very different: our brains didn't evolve to see the world as it is.

Can not do that.

Instead, the brain has evolved to see the world in ways that were convenient in the past.

And how we see it is done by continually redefining normality.

So how can we harness this amazing ability of brain plasticity to help people experience the world differently?

One of the ways I do it in my lab and studio is by converting light into sound so people can hear the visual world.

And they can use their ears to navigate the world.

Here on the right is David, holding the camera.

The one on the left is what his camera captured.

And you can see that there is a faint line across that image.

The line is divided into 32 squares.

Calculate the average color in each square.

All that's left is to translate it into sound.

And now he turns around and closes his eyes, trying to find a plate on the ground with his eyes closed.

(Continuous sound) (Instant sound change) (Instant sound change) (Instant sound change) (Instant sound change) (Instant sound change) Bo Lot: He found it. That's amazing?

So not only can we create prostheses for the blind, but we can also explore how people literally understand the world.

But you can also do other things.

So we worked with the kids to create an image of what it would sound like if we could hear the image you're looking at.

And translated these images.

And this is one of those images.

This is a 6-year-old kid composing music for a 32-piece orchestra.

And it's like this.

(electronic representation of orchestral music) and a 6-year-old. have understood?

So what does this mean?

What this suggests is that no one observes nature from the outside.

We are not defined by our core qualities or the elements that make us up.

We are defined by our environment and our interactions with it – ecology.

And that ecology is necessarily relative, historical, and empirical.

Well, I'd like to finish with this.

Because what I'm trying to do is celebrate uncertainty.

Because I believe that understanding is possible only through uncertainty.

So if anyone still feels a little too sure, I'd do this.

So when you turn off the lights

And what's here -- can you see the 25 purple surfaces on the left and the 25 yellowish surfaces on the right?

Now, what I want to do is just put a filter behind the middle 9 surfaces and put it under yellow lighting.

Now you can see that the light coming in from it changes, right?

Because light passes through a yellowish filter and then through a purplish filter.

Here we do the opposite of what we did on the left.

Place the middle nine under the purple light.

Now, some of you may have noticed that as a result, the light coming through the right or left middle nine is exactly the same as the light coming through the right middle nine.

Do you agree?Yes?

have understood. So they are physically the same.

Let's remove the cover.

Now remember -- you know that the middle nine are exactly the same.

do they look the same?

no.

I'll stop doing that.

Thank you very much.

(laughter) (applause)

So, I'm certainly going to talk about the space men create for themselves, but before that I want to talk about why I'm here.

I am here for two reasons. These two are my two sons, Ford and Ren.

When Ford was about three years old, we lived together in a very small room, in a very tight space.

My office was in one half of the bedroom and his in the other.

And if you're a writer, you can imagine things getting very crowded around deadlines.

So when the Wren came along, I realized I needed to find my own space.

There was no more space in the house. So I stepped out into my backyard and, with no previous building experience, spent about $3,000 and recycled materials to create this space.

We had everything we needed. It was quiet.

We had plenty of space. And I had control, which was very important.

While creating this space, I had this thought. "I'm sure I'm not the only one who's had to carve out a space for myself."

So I did some research.

And it turns out that there is a historical precedent.

Hemingway had a writing space.

Elvis had two or three manspaces, which is quite unique as he lived with both his wife and mother in Graceland.

In popular culture, Superman had his Fortress of Solitude and, of course, the Batcave.

So I wanted to travel and see what people were making for themselves right now.

This is one of the first spaces I found. It's in Austin, Texas, which is where I'm from.

The exterior looks like a very typical garage, nice garage.

But inside it is completely different.

And this, to me, is a pretty classic manspace.

There are neon concert posters, bars and, of course, all-important leg lamps.

I quickly realized that manspace doesn't have to be internal only.

This guy built a bowling alley in his backyard using landscaping lumber and astroturf.

Then he found the scoreboard in the trash.

This is an outdoor space with a little more sophistication.

This is a wooden tug built in 1923 and made entirely of Douglas fir.

The man did it all himself.

Indoors there is approximately 1,000 square feet of hangout space.

So, pretty early on in my research, I realized that what I found wasn't what I expected. It was, quite frankly, a sofa and a flat screen TV stuffed with lots of beer can pyramids and stuffing.

There was certainly a hangout.

But some were for work, some for play, and some for men to collect their stuff.

Most of all, I was simply amazed at what I found.

Consider this place for example.

The exterior looks like a typical Tohoku garage.

It is located in Long Island, New York.

The only thing that is likely to fall is the round window.

The interior reproduces a 16th-century Japanese tea room.

The man imported all the materials from Japan and hired Japanese carpenters to build it in a traditional style.

No nails or screws.

All joints are hand carved and hand carved.

This is another typical scene. This is a suburb of Las Vegas.

But open one of the garage doors and inside you'll find a professional-sized boxing ring.

(Laughter) There are good reasons for this.

It was built by a man named Wayne McCullough.

He won a silver medal for Ireland at the 1992 Olympics and trains in this space. he trains other people.

And just off the garage is his own trophy room where he can soak up his achievements. This is also an important part of manspace.

So while this space represents someone's profession, this space certainly represents a passion.

It is made with the image of the inside of a British sailing ship.

A collection of nautical antiques from the 1700s and 1800s.

museum quality.

So near the end of my journey, I found 50+ spaces.

And they were unexpected and surprising.

But so were they. I was really impressed with how individual they were and how much effort was put into them.

And I realized that it was because everyone I met was so passionate about their work.

And they really loved their profession.

And they were very passionate about their collections and hobbies.

So they created these spaces to reflect what they want to do and who they are.

So if you don't have a dedicated space for yourself, I highly recommend finding one and joining it.

thank you very much.

(applause)

essence of the invisible.

City, past and future.

In Oxford, in the words of Lewis Carroll, you might look into the mirror of New York City and see who you really are or go to another world.

Or, in the words of F. Scott Fitzgerald, "As the moon rose higher, the useless houses began to melt away, and I gradually became aware of this old island that once blossomed in the eyes of Dutch sailors and became the verdant bosom of the New World."

My colleagues and I have been working for ten years to rediscover this lost world in a project called the Manahetta Project.

We are trying to find out what Henry Hudson might have seen when he docked in New York Harbor on the afternoon of September 12, 1609.

I would like to divide this story into three acts. If there is still time, I would like to talk about the epilogue.

Well, act one: we found the map.

I mean, I didn't grow up in New York.

I grew up in Red Rock Canyon, the western part of the Sierra Nevada Mountains as seen here.

And from these early experiences as a child, I learned to love landscapes.

And when the time came for graduate studies, I studied this emerging field of landscape ecology.

Landscape ecology is concerned with how rivers, meadows, forests and cliffs form habitats for plants and animals.

This experience and training has given me a great job with the Wildlife Conservation Society, which works to protect wildlife and wild places around the world.

Over the past decade I have traveled to over 40 countries to see jaguars, bears, elephants, tigers and rhinos.

But every time I returned from my trip, I found myself back in New York City.

And on weekends, like other tourists, I climbed to the top of the Empire State Building and looked down at this landscape and ecosystem and thought, 'How does this landscape work to create habitat for plants and animals?'

How do I create a habitat for an animal like me?"

I went to Times Square and saw the amazing women on the walls and wondered why no one saw the historical figures right behind them.

I went to Central Park and watched the rugged terrain of Central Park confront the steep and sheer terrain of Midtown Manhattan.

I started reading about the history and geography of New York City.

I read that in 1950, New York City became the first megacity, a city with over 10 million people.

I started seeing pictures like this.

For those from New York, this is 125th Street under the West Side Highway.

(Laughter) This used to be a beach. And in this painting, the painter John James Audubon is sitting on a rock.

And from the tree-covered highlands of Washington Heights, looking up at Jeffreys Hook, which the George Washington Bridge crosses today.

Or this painting from the 1740s in Greenwich Village.

These are two students from King's College (later Columbia University) sitting on a hill overlooking the valley.

So I went to Greenwich Village to look for this hill, but I couldn't find it. And the palm tree was not found.

What is that palm tree doing there?

(Laughter) So, in the course of these investigations, I came across a map.

And that's this map right here.

It's stored in a geographic information system so you can zoom in.

This map is not from Hudson's time, but from the American Revolutionary War 170 years later, and was made by British military cartographers during the occupation of New York City.

And it's a great map. It's in the National Archives here in Kew.

And it's 10 feet long and 3.5 feet wide.

Zoom in on Lower Manhattan to see how big New York City was at the end of the American Revolutionary War.

This is bowling green. And here is Broadway.

And this is City Hall Park.

So the city was basically extended to City Hall Park.

And just beyond that, you can see the vanished features, vanished objects.

This is Collect Pond, a source of fresh water for New York City for the first 200 years and for Native Americans for thousands of years before that.

From here you can see the Lispenard Meadows cascade down, through what is now Tribeca, and the beach from Battery to 42nd Street.

This map was created for military reasons.

They map the roads, buildings and fortifications they have built.

But they also map hills, swamps, streams, and other things of ecological and military interest.

This is Richmond Hill and Minetta Water, which once flowed through Greenwich Village.

Or the swamps here in Gramercy Park.

Or Murray Hill. And this is the Murray family home in Murray Hill 200 years ago.

This is Times Square. Two rivers that met to form a wetland in Times Square at the end of the American Revolutionary War.

So I saw this wonderful map in a book.

And so I thought. “If we could georeference this map, if we could place this map in today’s urban grid, we would be able to find the missing features of cities in the block-by-block geography that people know, the geography of where people like to go to work, where they live, and where they like to eat.”

So after some work, I was able to georeference. This allowed cities to have modern streets, buildings, and squares, and the ability to zoom in on collecting pond locations.

You can digitize collection ponds and streams and see where they really are in today's urban geography.

So this is a fun way to find out where things are compared to the old terrain.

However, I had a different idea about this map.

If we remove the roads, remove the buildings, remove the squares, we get this map.

If you can recreate the features of the 18th century, you can go back in time.

We can bring it back to the ecological basis: hills, streams, basic hydrology and coastlines, coasts, the basic aspects that make up the ecological landscape.

You can then add maps of geology, bedrock geology, surface geology, glacier remnants, and more, create a soil map using the 17 soil classes defined by the National Wildlife Service, create a digital elevation model of the terrain showing hill heights, and calculate slope.

Aspect can be calculated.

The effect of winter wind can be calculated. This means you can calculate how winter winds blow across your terrain.

The white areas on this map are places that are protected from the winter winds.

We've put together all the information about where the Native Americans, the Lenape tribe, were.

And I created a probability map showing where they were.

So the red areas on this map show where Manhattan is best suited for human sustainability, where it's close to water, where it's close to harbors for fishing, and where it's sheltered from the winter winds.

We know that there was a Lenape settlement here by the Collect Pond.

And we knew they were planting a kind of horticulture, growing a beautiful garden of corn, beans and pumpkins, the "Three Sisters" garden.

So I built a model that explained where those fields were.

And the old field, the field that continues.

And we may think of these as abandoned.

But in reality, they are habitats for grassland birds and plants.

And they are, in turn, shrublands, blending into the map of all ecological communities.

And it turned out that Manhattan has 55 different ecosystem types.

You can think of these as areas as distinctive as Tribeca, the Upper East Side and Inwood: forests, wetlands, marine communities and beaches.

And 55 is a lot. On an area basis, Manhattan had more ecological communities per acre than Yosemite, Yellowstone, and Amboseli.

It was a truly extraordinary landscape capable of supporting extraordinary biodiversity.

Now, Act Two: The Rebuilt House.

So we studied fish and frogs, birds and bees, 85 species of fish that were in Manhattan, heather chickens, dead species, beavers in every stream, black bears, and Native Americans, and how they use and think about their landscape.

We wanted to map these out. So what we did was map out their habitat needs.

where do they get food?

where do they get their water from? where will they find shelter?

Where do their reproductive resources come from?

For ecologists, these intersections are habitats, but for most people, these intersections are homes.

So we have a field guide, perhaps a standard field guide that you might have on your shelf, that the beaver needs is "a slow meandering creek overgrown with poplars, alders and willows, near water." That's what's best for beavers.

So we just started making a list.

Here is the beaver. And here are streams, poplars, alders and willows.

It's as if these are the maps we need to predict where the beaver will be found.

Or a bog turtle that needs moist meadows and insects and a sunny spot.

Or rabbits and beavers and bobcats who need a burrow site.

And we soon began to realize that a beaver could be just what a bobcat needs.

But beavers need things too. And having it on either side means it can be tied together and create a network of habitat relationships for these species.

Furthermore, I realized that I could start as a Beaver specialist, but also find out what I need for Aspen.

Aspen needs fire and dry soil.

And you can see what a wet meadow needs.

And you need a beaver to make a swamp, and maybe something else.

But we can also talk about sunny places.

So what do you need in a sunny place? Not the habitat itself.

But what are the conditions that make it possible?

Or fire. Or dry soil.

You can place them on a grid that is 1,000 columns long from the top and 1,000 rows from the bottom.

You can then visualize this data like networks and social networks.

And this is a network that brings together the habitat relationships of all Manhattan's plants and animals and everything they need, going back to geology and back to time and space at the very heart of the web.

We call this the Muirweb. And when you zoom in, it looks like this.

Each point is a different species, different river, or different soil type.

And those little gray lines are the connections that connect them to each other.

They are indeed the connections that make nature resilient.

And for all its parts, this structure is what makes nature work.

We call these Muir webs, after the Scottish-American naturalist John Muir. Muir said, "When you try to pick something out by itself, you find that it is bound tightly to everything in the universe by a thousand invisible strings that never break."

So we got Muir's web and put it back on the map.

So if you wanted to go between 85th and 86th, Rex and third, there could have been a flow in that block.

And these would be trees, flowers, lichens, moss, butterflies, river fish, birds in trees of any kind that might have been there.

Maybe a timber rattlesnake lived there.

And maybe a black bear passed by. And probably Native Americans were there too.

and got this data.

You can see this for yourself on our website.

You can zoom in on any block in Manhattan and see what was there 400 years ago.

And then we tried to use that to reveal the scenery here in Act 3.

We used the tools used in Hollywood to create the stunning landscapes you see in the movies.

And I tried to use that to visualize Third Avenue.

So we took in the landscape and built the terrain.

Soil and water are laid on it and the landscape is illuminated.

We put a map of the ecological community on it.

And enter the seed map there.

To actually take the picture, I flew over Times Square and headed towards the Hudson River and waited for Hudson to come.

With this technology you can create such amazing georeferenced views.

We can basically take a picture from any window in Manhattan and see what the landscape was like 400 years ago.

This is the view from the East River looking up at Murray Hill, where the United Nations is today.

This is a view overlooking the Hudson River, with Manhattan on the left and New Jersey on the right, facing the Atlantic Ocean.

This is an east view of Times Square with Beaver Pond.

So you can see Collect Pond and Lispenard Wetlands in the background.

You can see the fields made by Native Americans.

And this can be seen in today's urban geography.

So, while watching Law & Order, lawyers walk down the steps of the New York Courthouse 400 years ago and up the steps that would have led them straight back to Collect Pond.

So these images are the work of my friend and colleague Mark Boyer who is here today.

And if you could lend him a hand, I would appreciate it if you could commend him for his excellent work.

(Applause.) There is so much power in combining science and visualization that you can create images like this, perhaps looking to either side of a mirror.

And although I have only had a short time to speak, I hope you understand that Manahatta is a very special place.

The places you see here on the left were interconnected. It was based on this diversity.

It had this resilience, which is what modern society needs.

But I don't want you to think I don't like the place on the right, and neither do I. I have come to love this city and its diversity, its resilience, its reliance on density, and how we are all connected.

In fact, I see them as reflections of each other, much like Lewis Carroll did in Through the Looking Glass.

We can compare these two and keep in mind at the same time that they are really the same place, that cities cannot escape nature.

And I think that's what we're learning about future city building.

So let me give you a quick epilogue, not in the past, but some 400 years from now, we find that cities are homes for people and need to provide them with what they need: home, food, water, shelter, reproductive resources, a sense of meaning, and so on.

This is an additional habitat requirement specific to mankind.

A lot of the talk here at TED is about meaning, about bringing meaning to our lives in all sorts of different ways: technology, art, science, etc., and I think we're focusing too much on that aspect of life and not paying enough attention to food, water, shelter, and what it takes to raise our children.

So how can we envision the cities of the future?

So what if you went to Madison Square Park and all the cars were gone, you had bikes instead, big forests, and rivers instead of sewers and storm drains?

Imagine an Upper East Side with green roofs, streams winding through the city, and windmills supplying the electricity we need?

Or imagine the New York City metropolitan area, where 12 million people live today, but 12 million in the future, perhaps with the same density as Manhattan, but on just 36 percent of the area. The area in between is covered with agricultural land, covered with wetlands, covered with necessary wetlands.

I think this is the future we need. A future that has the same diversity, richness and dynamism of Manhattan, but learns from the sustainability of the past, the ecosystem, the original ecosystem, the sustainability of all parts of nature.

thank you very much.

(applause)

There is an old parable about a farmer who lost his horse.

Then the neighbors came and said, "Oh, I'm sorry."

Then the farmer said, "Good or bad, I can't say."

A few days later the horse returned with seven wild horses.

Then the neighbors come and say, "Oh, that's great."

Then the farmer just shrugs his shoulders and says, "Good or bad, I can't say."

The next day, the farmer's son rode a wild horse and was thrown off, breaking his leg.

Then the neighbors say, "Oh, that's bad luck."

And the farmer says, "Good or bad, it's hard to say."

Before long, officials come knocking on people's doors looking for people to recruit into the army. And they see the farmer's son and his feet, and pass in front of him.

And the neighbors say, "Oh, that's so lucky!"

And the farmer says, "Good or bad, it's hard to say."

I first heard this story 20 years ago and have applied it 100 times since.

I didn't get the job I wanted, but it's hard to say whether it's good or bad.

I got the job I wanted, but it's hard to say whether it's good or bad.

For me, this story is not about looking on the bright side or waiting to see how things turn out.

What matters is how diligent you can be in labeling the situation, judging it, and articulating it.

But reality is more fluid, and the good and the bad are often the imperfect stories we tell ourselves.

This parable was a warning to me that by clinging too tightly to good or bad narratives, we close our ability to see the situation as it truly is.

You will learn more when you slow down and proceed openly with curiosity and wonder.

But seven years ago, when I was pregnant with my first child, I completely forgot this lesson.

I believed that I knew by heart what was good.

When it came to having children, I thought I'd like some kind of superbaby, a super-healthy human with no flaws who would put on a cloak and fly off into a superhero future.

I took DHA pills, ate mostly organic foods, trained for a drug-free birth, and much more to ensure my baby had a hyper-functioning, super-intelligent brain. Because I figured these things would help me not only have a good baby, but the best baby possible.

When my daughter Fiona was born, she weighed 4 pounds, 12 ounces, or 2.15 kilograms.

A pediatrician said there were only two possible explanations for her small body.

"It's either bad seed or bad soil," he said.

And I wasn't so tired from childbirth that I lost the thread of his logic. Doctors said my newborn was a bad plant.

We eventually found out that my daughter had a very rare chromosomal disorder called Wolf-Hirschhorn Syndrome.

She had lost part of her fourth chromosome.

And my daughter was fine. She was alive, with brand new baby skin and best known onyx eyes. But I also learned that people with daughter syndrome have significant developmental delays and disabilities.

Some never learn to walk or speak.

I didn't have the coolness of a peasant.

The situation looked decidedly bad to me.

But here this parable is very helpful. Because for weeks after her diagnosis, I was gripped by despair and trapped in a story that all this was tragic.

But thankfully the reality is much more fluid and there is much to be learned.

As I began to learn about this mysterious figure who was my child, my entrenched story of tragedy began to loosen.

It turns out that my daughter loves reggae. My husband smirked as he bounced his little body up and down to the rhythm.

Her onyx eyes eventually turned into the most stunning Lake Tahoe blue, and she loved using it to gaze intently into other people's eyes.

At five months old, she couldn't hold her head up like other babies, but she could maintain this deep, enthusiastic eye contact.

A friend said, "She's the most conscious baby I've ever seen."

But what I saw as a gift of her calm and attentive presence was that the occupational therapist who came to our home to work with Fiona saw a neurologically dull child.

This therapist was particularly disappointed that Fiona hadn't rolled over yet, so she told me her neurology needed to be awakened.

One day she leaned over her daughter, took her little shoulders and pushed them down and said, "Wake up! Wake up!"

I had a few therapists visit my home during that first year, and they mostly focused on what they thought was wrong with my child.

I was really happy when Fiona started using her right hand to tease the hanging stuffed sheep, but the therapist was glued to my child's left hand.

Fiona tends to use this hand less often and has her fingers crossed.

So the therapist said we should devise a splint. That would deprive my child of the ability to actually use the fingers, but at least force them into a normal looking position.

In my first year, I started noticing a few things.

1: Ancient parables aside, my child had some bad therapists.

(laughs) 2: I had a choice.

Like someone advised to take the red pill or the blue pill, I could choose to see my daughter's differences as a bad thing. I was able to work toward a goal her therapist said, "You'll never know."

They loved to pat themselves on the back about their child, saying, "You'll never know if this child is 'retarded' or 'autistic' or 'different.'" I believed that the good way was to eliminate as many differences as possible.

Of course, this would have been disastrous, as my daughter had a rare blueprint at the cellular level.

She wasn't designed to be like everyone else.

She will lead an extraordinary life.

So I had another option. I could stop talking about neurological differences, developmental delays, and disabilities. In other words, I could stop talking about the better life of the able-bodied.

I was able to let go of my cultural prejudices about life being good and bad and just watch my daughter's life unfold with candor and curiosity.

One afternoon she was lying on her back and managed to twist her body over her stomach with her back arched on the carpet and her tongue sticking out the side of her mouth.

Then she flipped over, back on her back, and when she got there, she managed to start over, rolling and wiggling her 12-pound self under the coffee table.

At first I thought she was stuck there, but then I saw her reaching for something she had been eyeing the whole time: a black electrical cord.

she was one year old.

Other babies her age were certainly getting up and toddling around.

For some, my child's situation looked bad. A one-year-old could only roll.

But that's no good.

My child enjoyed the new and flexible freedom of movement.

I was delighted.

Again, what I saw that afternoon was a baby pulling on an electrical cord. Good or bad I don't know, it's hard to say.

(Laughter) I started to realize that once I let go of the shackles of what makes life better or worse, I can see my daughter's life unfold and understand what it is.

It was beautiful, complex, fun, and hard. In other words, it is a mere representation of the human experience.

Eventually my family and I moved to a new state in the US and we were lucky enough to have a new group of therapists.

They didn't focus on all my child's issues.

They didn't see her differences as a problem to fix.

They acknowledged her limitations but also recognized her strengths and celebrated her for who she is.

Their goal was never to make Fiona as normal as possible. Their goal was simply to help her reach her full potential and be as independent as possible, which was difficult for her.

But the culture as a whole does not have such an open attitude about disability.

We call inborn differences "inborn defects", as if humans were objects on a factory line.

When we learn that a colleague has a baby with Down's syndrome, we might get a look of sympathy.

We applaud blockbuster movies about suicidal wheelchair users, even though real wheelchair users say stereotypes are unfair and harmful.

And sometimes medical institutions decide what kind of life is not worth living.

Such is the case with Amelia Rivera, a girl with the same syndrome as my daughter.

In 2012, a prestigious children's hospital in the United States initially denied Amelia her right to a life-saving kidney transplant, saying she was "mentally retarded," according to hospital documents.

This is how narratives that make disability evil emerge in culture.

But there's a surprisingly insidious backstory. In particular, people with intellectual disabilities are good because they come to teach us something magical, or because they are angelic in nature and always kind.

You've probably heard the metaphors of disability first, like the boy with Down syndrome who is one of God's special children, or the girl who is a little angel with a walker and a communication device.

This story comes into my daughter's life around Christmas. Then some people get positively dizzy at the thought of seeing a girl with angel wings and a halo at a pageant.

What is implied is that these people have not experienced the troubling complications of being human.

And while my daughter could actually look like an angel at times, especially as a baby, she grew up to be the type of kid who would do mean things like other kids do when she pushed her two-year-old sister when she was four.

My girlfriend has the same right to embarrass you as any other child.

When we label people as tragic or angelic, bad or good, we rob them of their humanity, and rob them of their rights and dignity, as well as the embarrassment and complexity that these titles bring.

My girlfriend didn't exist to teach me or us anything, but she did teach me. First, the number of mozzarella cheese sticks a 22-pound person can consume in a day. For the record, this is 5. And second, the gift of questioning your own culture's beliefs about what makes life good and what makes life bad.

If you had told me six years ago that my daughter sometimes used an iPad app to communicate, I might have thought I was sad.

But now I remember the first time I gave Fiona an iPad. It was packed with 1,000 words, each represented by a small icon or square on the iPad app.