You can also wear mascara and body armor.

You love crossfit and maybe you love cross stitch.

Maybe you like getting out of helicopters, maybe you like baking cookies.

Women live every day and they brought that to this mission.

In this life-or-death battlefield, they never forgot that being a woman could have brought them to the front lines, but it was being a soldier who could prove themselves there.

The night Amber was out on a mission, while talking to the women in the house, she realized that the shooter had ambushed and barricaded the Afghan and American troops waiting to enter the house.

Another night, Tristan discovers that there are fragments of explosives around the house they were standing in, and that in fact the explosives were rolling all the way between there and where they were going that night.

The night another teammate proved himself to the clearly skeptical SEAL team, they found the informational item they were looking for wrapped in a baby's wet diaper.

And then there was the night when another teammate, Isabelle, found what she was looking for and won the Impact Award from the Rangers. I was told that without her I would never have found what or who I was looking for that night.

That night, and many others, went out to prove themselves not only for each other, but for everyone who came after them.

And even for the men they served with.

We often talk about how behind every great man there is a great woman.

And in this case, standing next to the women were men who wanted to see them succeed.

The Army Rangers who trained them served on 12 deployments.

And when he was told he had to train the girls, he didn't know what to expect.

But in the summer of 2011, at the end of eight days with them, he told fellow rangers, "We just witnessed history.

Perhaps they are our Tuskegee pilots. ”

(Applause.) At the center of this team was one person that everyone called "the best of us."

She's a petite blonde dynamo who barely reached 5'3" tall.

And she was a wild mix of Martha Stewart and what we know as GI. Jane.

She was someone who loved to cook dinner for her husband, a Kent State University ROTC lover. My husband pushed me to do my best, believe in myself, and push myself to the limit.

She also loved running miles carrying 50 pounds and loved being a soldier.

She was the one who had a bread machine in her office in Kandahar, baked raisin bread, then went to the gym and did 25 or 30 pull-ups from a desperate situation.

She was the kind of person who would call you on speed dial when you needed an extra pair of boots or a home-cooked dinner.

Because she never told you how great she was and let her character speak through her actions.

She was famous for advocating harsh righteousness over easy evil.

And she famously walked up to a 15-foot rope and climbed it using only her arms before limping away and apologizing. Because she knew she should use both arms and legs like the Rangers were training.

(Laughter) Some of our heroes go home to tell their stories.

And some people don't.

And on October 22, 2011, Lieutenant Ashley White was killed along with two Rangers, Christopher Hornes and Christopher Domay.

Her death brought the program, built for shadow people, into the public eye.

After all, the ban on women in combat was still strictly enforced.

And at her funeral, the Chief of Army Special Operations came to give public testimony not only to Ashley White's bravery, but to all of her sister teams.

"Don't get me wrong, they're warriors and they've written another chapter about what it means to be a woman in the U.S. Army," he said.

Ashley's mother is a teacher's assistant, a school bus driver, and a side job baking cookies.

She doesn't remember much of those overwhelming days when grief--tremendous grief--was mixed with pride.

But she remembers one moment.

A stranger came up to her with a child in her hand and she said, "Mr. White, I brought my daughter here today because I wanted her to know what a hero is.

And I wanted her to know that heroes can be women too. ”

It's time to celebrate all the unsung heroes who have found the heart and grit to reach into their guts, keep pushing forward, and push all limits.

This unlikely band of sisters, bound forever in life and beyond, has indeed become a part of history, paving the way for many to come, just as they stood on the shoulders of their predecessors.

These women showed that warriors come in all shapes and sizes.

And women can be heroes too.

Thank you very much.

(applause)

This is my great uncle, my father's father's brother.

His name was Joe McKenna.

He was a young husband, a semi-professional basketball player, and a New York City firefighter.

According to family history, he loved being a firefighter so much that in 1938 he decided to spend his days off at the fire station.

That day he began to polish all the brass, fire truck railings and wall fittings to be useful, but a huge, heavy piece of metal, one of the fire hose nozzles, fell off the ledge and hit him.

A few days later his shoulder started hurting.

Two days later, he suddenly had a fever.

The heat was getting hotter and hotter.

His wife was taking care of him, but nothing she did made a difference, and when he was seen by a local doctor, nothing made sense for him.

They alerted a taxi and took him to the hospital.

The nurses there quickly realized that he had an infection (what they called "septicemia" at the time) and quickly realized, perhaps silently, that there was nothing they could do.

There was nothing they could do, because what we now use to treat infections didn't exist yet.

The first test of penicillin, the first antibiotic, was three years later.

Those infected either recover or die, if they are lucky.

My great uncle wasn't so lucky.

He was hospitalized for a week, shivering with chills, dehydrated and delirious, and comatose from organ failure.

His condition had become so hopeless that people at the fire department lined up to give him a blood transfusion in hopes of diluting the infections that were flooding his blood.

nothing worked. he died

he was 30 years old.

If you look back in history, most people died like my great-uncle.

Most people did not die of cancer or heart disease, the lifestyle diseases that plague us in the West today.

They didn't die from those diseases because they didn't live long enough to develop them.

They died from injuries such as being gored by cattle, being shot on the battlefield, being crushed in one of the new factories of the Industrial Revolution, and most often from the infections that ended what those injuries began.

Everything changed when antibiotics came along.

All of a sudden, I was recovering from a deadly infection within days.

It seemed like a miracle, but since then we are living in a golden age of miracle drugs.

And now we are coming to the end of it.

My great-uncle died in the last days of the pre-antibiotic era.

We stand today on the threshold of the post-antibiotic era. It's the early days of an era when simple infections like the one Joe contracted kill people again.

In fact, they already do.

More people are dying from recurrent infections due to a phenomenon called antibiotic resistance.

Simply put, it works like this.

Bacteria compete with each other for resources and food by manufacturing mutually acting lethal compounds.

Other bacteria evolve defenses against their chemical attacks to protect themselves.

When we first made antibiotics, we took those compounds into the lab to create our own versions, and the bacteria responded to our attacks as they always have.

Here's what happened next: Penicillin was distributed in 1943 and by 1945 widespread penicillin resistance had arrived.

Vancomycin appeared in 1972 and vancomycin resistance appeared in 1988.

Imipenem in 1985 and resistance in 1998.

In 2003, resistance to one of the newest drugs, daptomycin, emerged just one year later, in 2004.

For 70 years we have been playing the leapfrog game of drugs, resistance, then another drug, then resistance again, and now that game is over.

Bacteria develop resistance so rapidly that pharmaceutical companies have decided that it is not in their interest to manufacture antibiotics, so of the more than 100 antibiotics available on the market, infections are occurring worldwide where 2 have side effects, 1 is effective or ineffective at all.

Here's how it looks.

In 2000, the Centers for Disease Control and Prevention (CDC) identified one case of an infection in a North Carolina hospital that was resistant to all but two drugs.

Now known as KPC, the disease has spread to all but three states, and to South America, Europe and the Middle East.

In 2008, Swedish doctors diagnosed a man from India with another infection that was then resistant to all but one drug.

The gene that produces that resistance, known as NDM, has now spread from India to China, Asia, Africa, Europe, Canada and the United States.

While it would be natural to wish these infections were an anomaly, the reality is that drug-resistant infections kill 50,000 people a year in the United States and Europe.

A UK government-sanctioned project known as the 'Antimicrobial Resistance Review' estimates that it now kills 700,000 people a year worldwide.

This is a very high number of deaths, and yet you most likely do not feel unsafe, imagining that these people are inpatients in intensive care units or nursing home residents nearing the end of their lives, people far away from us who have been infected in situations where we cannot identify them.

What neither you nor we have thought about is that antibiotics underpin almost everything in modern life.

If we lose antibiotics, what else do we lose? First, all protection for people with compromised immune systems: cancer patients, AIDS patients, transplant patients, premature babies, etc.

The next treatment is to insert a foreign body into the body. Stroke stents, diabetic pumps, dialysis, and joint replacements.

How many sports baby boomers need new hips and knees?

A recent study estimated that 1 in 6 people would die without antibiotics.

Second, you will probably not be able to have surgery.

Antibiotics are given prophylactically in many surgeries.

Without that protection, we lose the ability to open up the body's hidden spaces.

Therefore, no heart surgery, prostate biopsy, or caesarean section.

We must learn to fear infections that now seem minor.

Streptococcal pharyngitis used to cause heart failure.

A skin infection led to amputation.

Nearly 1 in 100 women died in childbirth in the cleanest hospitals.

Three out of ten children died of pneumonia.

Most of all, it leaves us unable to go about our daily lives with confidence.

Would you ride a motorcycle, blow up a ski slope, climb a ladder to hang Christmas lights, or slide a child into home plate if you knew that an injury could cost you your life?

After all, the first person to be given penicillin was Albert Alexander, a British police officer whose scalp was oozing pus and had an infection that doctors had to pick his eyes out.

He went into the garden and scratched his face with a thorn.

The UK project I mentioned estimates that the current global death toll is 700,000 per year, and predicts that if this is not brought under control by 2050, it won't be long, and the global death toll will be 10 million per year.

How did we arrive at this frightening number that we should expect?

The hard answer is that it's what we did to ourselves.

Resistance is an inevitable biological process, but it is our responsibility to accelerate it.

We have done this by wasting antibiotics with what is now alarming carelessness.

Penicillin was sold over the counter until the 1950s.

Most antibiotics are still used in many developing countries.

In the United States, 50% of hospital-administered antibiotics are unnecessary.

45% of prescriptions written in clinics are for conditions where antibiotics don't work.

And that's just for the medical field.

In many parts of the globe, most meat animals take antibiotics daily for the rest of their lives, not to cure disease, but to fatten them up and protect them from the factory farm environment.

In the United States, perhaps 80 percent of the antibiotics sold each year are used on livestock rather than on humans, creating resistant bacteria that migrate from farms into water, dust, and animal meat.

Aquaculture is also dependent on antibiotics, especially in Asia, and fruit cultivation is also dependent on antibiotics to protect apples, pears and citrus from disease.

And like a traveler handing over a suitcase at an airport, bacteria can pass DNA on to each other, so once you've fostered their resistance, you don't know where they'll spread.

This was predictable.

In fact, it was predicted by Alexander Fleming, who discovered penicillin.

He was awarded the Nobel Prize in 1945 for his work. In an interview shortly after, he said: "Reckless people who toy with penicillin therapy have a moral responsibility for the death of a man who died of a penicillin-resistant infection."

He added, "I hope this evil can be avoided."

Can it be avoided?

There are companies working on new antibiotics that Superbugs have never seen before.

We desperately need these new drugs. We also need incentives such as discovery grants, extended patents, and prizes to lure other companies to remanufacture antibiotics.

But that's probably not enough.

Here's why. Evolution always wins.

Bacteria produce a new generation every 20 minutes.

In pharmaceutical chemistry, it takes 10 years to derive a new drug.

Every time we use antibiotics, we give bacteria billions of chances to crack the code of the defenses we have built.

No drug yet exists that they have not been able to defeat.

This is an asymmetric war, but you can change the outcome.

It may be possible to build a system that collects data to automatically and specifically inform how antibiotics are being used.

You can incorporate gatekeeping into your drug ordering system to ensure that all prescriptions are double-checked.

Agriculture could be asked to stop using antibiotics.

We could build a surveillance system to let us know where resistance is coming next.

That's the technical solution.

Unless we help, they probably won't be enough either.

Antibiotic resistance is a habit.

We all know how difficult it is to change habits.

But as a society, we have done it in the past.

People used to litter the streets, didn't wear seatbelts, and smoked in public buildings.

we don't do that anymore.

We do not destroy the environment, court catastrophic accidents, or expose others to the possibility of cancer. Because we decided they were expensive, disruptive, and not in our best interest.

We have changed social norms.

Societal norms regarding antibiotic use could also change.

We know the scale of antibiotic resistance can seem overwhelming, but if you've ever bought a fluorescent bulb because you're concerned about climate change, or read the label on a box of crackers because of palm oil deforestation, you already know what it feels like to take small steps to address an overwhelming problem.

Such measures could also be taken for the use of antibiotics.

If you are unsure if antibiotics are right for you, you can even withhold antibiotics.

We could stop asking for prescriptions before the cause of ear infections in children is known.

You can also ask every restaurant and supermarket where their meat comes from.

You can promise never to buy chicken, shrimp, fruit, etc. that are routinely grown with antibiotics, and you can delay the arrival of a post-antibiotic world.

But we have to do it now.

Penicillin started the antibiotic era in 1943.

In just 70 years, we have walked ourselves to the brink of disaster.

It will take less than 70 years to find a way to escape again.

thank you very much.

(applause)

I grew up studying the brain because I have a brother who was diagnosed with schizophrenia, a brain disorder.

And as a sister, and later as a scientist, I wanted to understand why I have my dreams, how I can connect them to reality, and make my dreams come true.

Why am I unable to connect my dreams to a common reality about my brother's brain and schizophrenia, and instead become delusional?

So I dedicated my career to researching severe mental illness.

And I moved from my home state of Indiana to Boston, where I worked in the lab of Dr. Francine Benez in the Department of Psychiatry at Harvard University.

In the lab, the question was, "What are the biological differences between the brains of people diagnosed as normal controls and those diagnosed with schizophrenia, schizoaffective disorder, or bipolar disorder?"

So we were basically mapping the microcircuits of the brain. So which cells are communicating with which cells, with which chemicals, and in what amounts of those chemicals?

During the day doing this type of research meant a lot to my life, but at night and on weekends I traveled as an advocate for NAMI (National Alliance on Mental Illness).

But on the morning of December 10, 1996, I woke up to find myself brain-damaged.

A blood vessel ruptured in the left half of the brain.

And over the course of four hours, I saw my brain completely lose its ability to process all information.

On the morning of the hemorrhage, I could not walk, speak, read, write, or remember life.

I essentially became an infant in a female body.

If you've ever seen the human brain, it's clear that the two hemispheres are completely separate from each other.

And I brought a real human brain.

(Moans, laughter) So this is the real human brain.

This is the front part of the brain, the back part of the brain where the spinal cord hangs down and is laid out like this in my head.

And if you look at the brain, it's clear that the two cerebral cortices are completely separate from each other.

For those who understand computers, our right hemisphere works like a parallel processor and our left hemisphere like a serial processor.

The two hemispheres communicate with each other through the corpus callosum, which consists of approximately 300 million axonal fibers.

But other than that, the two hemispheres are completely separated.

Because of how we process information differently, each of our hemispheres thinks differently, cares about different things, and, dare I say it, has very different personalities.

excuse me. thank you. I was very happy.

(Laughter) Our human right hemisphere is all about this moment.

Everything is here and now.

Our right brain thinks in pictures and learns kinesthetics through body movements.

Information flows in the form of energy into all of our sensory systems simultaneously, exploding a giant collage of what this moment looks like, what this moment smells and tastes, feels and sounds.

I am an energy being connected to the energies around me through my right hemisphere consciousness.

We are energetic beings connected to each other as one human family through our right hemisphere consciousness.

And now here we are, brothers and sisters on Earth, here to make the world a better place.

And in this moment we are perfect, whole and beautiful.

My left hemisphere, our left hemisphere, is a completely different place.

Our left hemisphere thinks linearly and methodically.

Our left hemisphere is all about the future as well as the past.

Our left hemisphere is designed to take in a giant collage of the present moment and start extracting details, and even more details about those details.

We then categorize and organize all that information, relate it to everything we have learned from the past, and project all our possibilities into the future.

And our left hemisphere thinks in language.

It is an ongoing brain chatter that connects me and my inner world to the outer world.

It's a little voice telling me, "Hey, don't forget to pick up the bananas on the way home."

I need it in the morning. ”

It's that calculating intelligence that reminds me when I have to do my laundry.

But perhaps most important is that little voice that says to me, "I am, I am."

And the moment my left hemisphere says, "I am," I am separated.

I become a single, solid individual, separate from the energy flow around me and separate from you.

And this was the part of my brain that I lost the morning of my stroke.

The morning after my stroke, I woke up with a throbbing pain behind my left eye.

And it was the caustic pain you feel when you bite into ice cream.

And it just grabbed me - and then released me.

And it just grabbed me and then released me.

And since it was very rare for me to experience any kind of pain, I thought, 'Okay, let's get on with life as usual.'

So I got up and jumped on a cardio glider, a full-body exercise machine.

And I was so obsessed with this that I realized my hands looked like primitive claws gripping a bar.

And I looked down at my body and thought, 'Oh, I look weird.

And it was as if my consciousness had shifted from the normal perception of reality as a human being in a machine and experiencing it, to the esoteric space of witnessing myself in this experience.

And it was all very strange and my headache only got worse.

So I got off the machine and walked across the living room floor and noticed that everything in my body slowed down significantly.

My pace is inflexible and my perceptual realm is limited, so I focus only on my internal systems.

And as I stood in the bathroom getting ready to take a shower, I could actually hear the conversation inside my body.

I heard a small voice say, "OK. Muscles, you have to contract."

Muscles, relax. ”

Then I lost my balance and leaned against the wall.

And when I looked down at my arm, I realized that I could no longer define the boundaries of my body.

The atoms and molecules on my arm mixed with the atoms and molecules on the wall, so I can't define where to start and where to end.

And all I could sense was this energy, energy.

And I ask myself, "What am I doing wrong?"

what's going on? "

And in that moment, my left hemisphere brain chatter was completely silenced.

It's like someone picking up a remote control and hitting the mute button.

And at first I was shocked to find myself in a silent mind.

But soon I was fascinated by the magnificence of the energy all around me.

And because I no longer knew the boundaries of my body, I began to feel huge and expansive.

I felt at one with all the energy that was there and it was beautiful.

Then suddenly my left hemisphere is back online and says "Hey! Something went wrong!"

have to ask for help. ”

And I think, "Oh! There was a problem!"

(Laughter) So it's like, 'OK, there's a problem.

But then I quickly came back into consciousness. And I affectionately call this space “La La Land.”

But it was beautiful there.

Imagine what it would be like to be completely disconnected from the inner chatter that connects you to the outside world.

So here I am in this space, my job, and all the stress associated with my job, was gone.

And my body felt lighter.

And imagine that all your relationships in the outside world and all the stressors associated with them are gone.

And I felt this peaceful feeling.

And imagine what it feels like to lose 37 years of emotional baggage.

(laughter) Oh! I felt euphoric, euphoric.

And then again my left hemisphere came online and said, 'Hey, I have to be careful.

have to ask for help. ”

And I think, 'I need help, I have to focus.'

So I get out of the shower, put on my clothes mechanically, and walk around my apartment thinking, "I need to go to work. Can I drive?"

At that moment, my right arm was completely paralyzed.

That's when I realized, "Wow! I'm having a stroke!"

And the next thing my brain says to me is, "Wow!" This is so cool!

How many neuroscientists have the opportunity to study their brain from the inside out?"

(Laughter.) And it's like, 'But I'm a very busy woman!'

(Laughter) "I don't have time to have a stroke!"

So I said, 'Okay, you can't stop a stroke from happening, so I'm going to keep doing this for a week or two, and then I'll go back to my normal routine.

So I have to call for help. I have to call work. ”

At work I couldn't remember the number, so I remembered that the office had a business card with my number on it.

So I went into the business room and pulled out a stack of three-inch business cards.

And I'm looking at the top card. I could clearly see in my mind's eye what my business card looked like, but since all I could see were pixels, I wasn't sure if this was my card.

And the word pixels blended with the background pixels and the symbol pixels, making it completely indistinguishable.

And I wait for the so-called wave of clarity.

And in that moment I was able to return to my normal reality again and knew it wasn't a card...it wasn't a card.

It took me 45 minutes to get an inch into that stack of cards.

Meanwhile, for 45 minutes, the bleeding in the left hemisphere increases.

I don't have a number or a phone, but that's the only plan I have.

So I take out my phone pad and put it here.

I take out a business card, put it here, and match the wavy shape of the card to the wavy shape of the phone pad.

But then I went back to La La Land and don't remember if I had already dialed the number when I got back.

So I had to swing my paralyzed arm around like a stump and keep pressing while hiding the number. Then, when you return to normal reality, you will know, "Yes, I already dialed that number."

Eventually, all the numbers were dialed, and as I listened to the call, a colleague picked up the phone and he said to me, "Woo, woo, woo." (Laughter) (Laughter) And I thought to myself, 'Oh my God, he looks like a Golden Retriever!'

(Laughter) So I tell him -- I tell him clearly in my mind, "This is Jill! I need help!"

And what comes out of my voice is "Woo Woo Woo Woo".

I'm thinking, "Oh my god, I look like a golden retriever."

So I couldn't know. I didn't know I couldn't speak or understand a language until I tried it.

So he recognizes that I need help and asks me for help.

And a little while later, I was in an ambulance from a hospital in Boston to [Massachusetts] General Hospital.

And I end up curled up in a tiny fetal ball.

And like the last air-filled balloon, the moment I stepped out of the balloon, I felt my energy rise and my spirit surrender.

And in that moment I knew that I was no longer the choreographer of my life.

And either the doctors saved my body and gave me a second chance at life, or this was my turning point.

When I woke up later that afternoon, I was shocked to find that I was still alive.

When I felt my soul surrender, I said goodbye to my life.

And my mind was now floating between two diametrically opposed sides of reality.

The stimulus coming through my sensory organs felt like pure pain.

The light burned through my brain like wildfire and the sound was so loud and chaotic that I couldn't make out my voice from the noise around me and just wanted to escape.

Unrecognizable to my body position in space, I felt huge and vast, like a genie just released from a jar.

And my mind soared free like a great whale gliding over a sea of ​​quiet euphoria.

Nirvana.

And I remember thinking I would never be able to push my enormity back into this tiny little body.

But then I realized, "But I'm still alive!"

I am still alive and have found nirvana.

And if I find nirvana and I am still alive, then anyone who is alive will be able to find nirvana. ”

And I imagined a world filled with beautiful, peaceful, caring, loving people who knew they could come into this space at any moment.

And they can deliberately choose to go to the right rather than the left hemisphere and find this peace.

And I realized what a wonderful gift this experience was, and how great an insight this would be for the way we live our lives.

Two and a half weeks after the bleeding, a surgeon came in and removed a golf-ball-sized blood clot that was compressing my language center.

here i am with mama. Mom is a true angel in my life.

So who are we?

We are the cosmic life force with manual dexterity and dual cognition.

And we have the power to choose who we want to be and how we want to be in the world at every moment.

Now, here, I can step into the right hemisphere of consciousness, where we are.

I am the life force of the universe.

I am the life force of the 50 trillion beautiful molecular geniuses that compose my form, and I am one with all things.

Alternatively, I can choose to step into the left hemisphere of consciousness, where I will become a single individual, a solid.

I am Dr. Jill Bolte Taylor. I am an intelligent neuroanatomist.

Which do you choose?

And when?

We believe that the more time we spend activating the deep inner peace circuits of our right hemisphere, the more peace we project into the world and the more peaceful the planet will be.

Karl Benz invented the automobile in 1885.

Later that year, he took the car out for its first public test drive and—true story—smashed into a wall.

For the past 130 years, we've been working on the most unreliable part of a car: the driver.

We made the car stronger.

We've added seat belts, we've added airbags, and for the last decade we've really started trying to make cars smarter to fix driver bugs.

So, today I'm going to talk a little bit about the difference between solving driver assistance systems problems and actually introducing fully self-driving cars and what they can do for the world.

I'm also going to talk a little bit about our cars to see how they perceive the world, how they react, and what they do, but before that, let's talk a little bit about the problem.

And this is the big question. Every year, 1.2 million people die on roads around the world.

In the United States alone, 33,000 people die each year.

In my humble opinion, this is the equivalent of 737 falling from the sky every day.

It's hard to believe.

This is how cars are sold, but this is how driving actually works.

right? It's not sunny, it's raining, and I want to do something other than drive.

The reason is that traffic conditions are getting worse.

Between 1990 and 2010, vehicle miles traveled in the United States increased by 38%.

We grew 6 percent of the road, so it's not on your mind.

In fact, the traffic situation is significantly worse than it was a while ago.

And all of this is very human cost.

The average commute time in the US is about 50 minutes, but multiply that by 120 million workers and you'll find that about 6 billion minutes are wasted on the daily commute.

This is a big number, so let's put it in perspective.

Divide that 6 billion minutes by the average human lifespan, and you'll find that 162 lifetimes are wasted just moving from A to B each day.

can't believe it.

And some people don't have the privilege of sitting in traffic.

So here is Steve.

He's an incredibly talented guy, but he just happens to be blind. So instead of a 30-minute drive to work in the morning, you'll need a two-hour ordeal of juggling public transportation or having a friend or family member drop you off.

He doesn't have the same freedom that you and I have to move.

should do something about it.

Now, conventional wisdom would say that we will take these driver assistance systems as they are, push them forward and incrementally improve them, and over time they will turn into self-driving cars.

Well, what I'm trying to say here is like saying that if you work hard at jumping, one day you'll be able to fly.

You actually have to do something a little different.

So, let's talk about three ways that automated driving systems differ from driver assistance systems.

Let's start with our own experience.

So in 2013, we did our first test of a self-driving car and let the public use it.

Well, it was almost regular. They were 100 Googlers, but they weren't working on the project.

And we gave them a car so they could use it in their daily life.

However, unlike a real self-driving car, this vehicle had a big asterisk. Since this is an experimental vehicle, some care had to be taken.

I've tested it many times and it can still fail.

So we gave them two hours of training and put them in the car and let them use it. And as someone trying to get a product out there, the words we heard were great.

They all told us they loved it.

In fact, there was a Porsche driver who came in on day one and said, 'This is completely stupid. What are we thinking?'

But in the end he said, "I shouldn't be the only one who should have it, others should have it, because people are terrible drivers."

It sounded like music to our ears, but then we started paying attention to what the people in the car were doing. This was an eye opener.

Well, my favorite story is this gentleman. You look down at your phone, you realize your battery is low, you turn around in your car, you look in your backpack, you take out your laptop, you put it on the seat, you go back in the back again, you look around, you take out your phone charging cable, you hang around, you put it in your laptop, you put it in the phone.

Sure enough, the phone is charging.

He's always on the highway at 65 mph.

right? can't believe it.

So we thought about this and said it was a given.

The more advanced the technology, the less reliable the driver.

So just making your car progressively smarter probably won't get you the wins you really need.

Let me be a little technical here.

Let's take a look at this graph. Below that is how often the car brakes when it doesn't need to.

If you're driving around town and the car starts to stop erratically, you'll never buy that car, so you can ignore most of its axles.

And the vertical axis shows how often the car brakes to avoid an accident.

Now, if you look in the bottom left corner here, this is your classic car.

It won't brake or do anything crazy, but it won't save you from an accident either.

Now, if you want to put a driver assistance system in your car, for example collision mitigation braking, you're going to put some kind of technology package in there. That's what this curve is, and it will have some operating characteristics, but not all accidents can be avoided. Because you don't have that ability.

But choosing a location along the curve here would probably avoid half the accidents that human drivers would miss. Isn't this great?

There are now 17,000 fewer deaths each year in the United States.

But if you want self-driving cars, you need a technology curve that looks like this:

We need to install more sensors on the vehicle, so we choose an operating point here that is essentially collision-free.

They do happen, but very infrequently.

Now, you and I can look at this and debate whether it's incremental or not. And I can say something like the '80/20 rule', but it's really hard to get into that new curve.

But let's look at it from a slightly different direction.

So let's see how often the technology needs to do the right thing.

And this green dot here is the driver assistance system.

It turns out that about once every 100,000 miles in America, a human driver makes a mistake that leads to a traffic accident.

In contrast, a self-driving system probably makes about 10 decisions per second, or about 1,000 per mile.

So if you compare the distance between the two, it's about 10 to 8, right?

It is 8 digits in size.

It's like comparing your running speed to the speed of light.

No matter how hard you train, you can't really get there.

So there's a pretty big gap there.

And finally, there is the question of how the system can deal with uncertainty.

That is, the pedestrian may or may not be stepping into the road.

I don't know, I don't know our algorithms, but for driver assistance systems that means no action. Because, again, if you hit the brakes unexpectedly, it's totally unacceptable.

A self-driving system, on the other hand, can see a pedestrian, say, "I don't know what you're doing," slow down, take a closer look, and then react appropriately.

Therefore, it can be much safer than driver assistance systems.

Enough about the difference between the two.

Let's spend some time talking about how cars see the world.

So this is our vehicle.

First, get a map and its sensor data, then reconcile the two to understand where you are in the world. Then overlay what you are seeing at that moment on top of it.

Here all the purple boxes are other vehicles on the road and the red ones on the far side are bicycles. And in the distance you can see some cones if you look closely.

Then you know where the car is at that moment, but you have to do even better than that. You have to anticipate what will happen.

Here, the pickup truck on the top right is about to change lanes to the left. The road in front of it is closed to traffic, so you need to get out of the way.

Knowing one pickup truck is great, but it's a very complex problem because you really need to know what everyone is thinking.

And with that in mind, we can understand how the car should react at that moment: what trajectory it should take, how fast it should decelerate or accelerate.

And it all just goes down the road. Just turn the steering wheel left and right and step on the brake or step on the accelerator.

After all, it's just two numbers.

So how hard is it really?

When we started in 2009, our system looked like this:

Driving down the highway we see our car in the middle and the other boxes on the road.

Cars need to have a rough idea of ​​where they are and where other vehicles are.

It's just a geometric understanding of the world.

Once you start driving around neighborhoods and city streets, the problem takes on a whole new level of difficulty.

We see pedestrians crossing in front of us, cars crossing in front of us, traffic lights going in all directions, crosswalks.

By comparison, it's an incredibly complex problem.

And once that issue is resolved, the vehicle must be able to cope with construction.

Here the cone on the left forces the drive to the right, but of course it is not simply built on its own.

Other people passing through that construction zone must also be dealt with.

And of course the car has to understand that if someone breaks the rules the police will come and the flashing lights on top of the car mean it's not just a car, it's actually a police officer.

Similarly, the orange box here next to it is a school bus, which should also be treated differently.

Others have expectations when we are out on the road. So when a cyclist raises his arm, it means he expects the car to give way and make room for the lane change.

And when the police are standing on the road, our cars know it means stop, and when they give the signal to start, we have to continue.

Currently, the way this is accomplished is by sharing data between vehicles.

This first and most crude model is for one vehicle to spot a construction zone and notify another vehicle so that it can move to the correct lane and avoid difficulties.

But in fact we have a deeper understanding of this.

We can take all the data that cars have seen over the years, the hundreds of thousands of pedestrians, cyclists, and vehicles that have been there to understand what they look like, and use that to infer what other vehicles and other pedestrians should look like.

And more importantly, from there we can get a model of how they are expected to move around the world.

Here, the yellow box is the pedestrian crossing in front of you.

Here the blue boxes are on bikes and we would expect them to be nudging out towards the right side of the car.

Here the cyclists are coming down the road and you can see they keep following the shape of the road.

Here someone turns right, and soon someone is about to make a U-turn in front of us, and we can anticipate that action and respond safely.

For what we've seen so far, that's enough, but of course you'll come across a lot of things you've never seen before.

And just a few months ago, when our car was driving through Mountain View, this was what we encountered.

This is a woman in an electric wheelchair chasing ducks on the road. (Laughter) Well, it turns out the DMV handbook doesn't say how to deal with it, but our vehicle ran into it, slowed down, and was able to drive safely.

Now, you don't have to deal only with ducks.

Watch this bird fly past us. The car reacts to it.

Here's a cyclist you'll never see outside of Mountain View.

And of course we have to deal with drivers, even very small ones.

Notice someone jumping out of this truck towards us on the right.

And now look to the left as the green box car decides at the last minute that it needs to turn right.

Now, when we change lanes, we decide that the car on the left also wants to change lanes.

And here we see a car ignore a red light and give way.

And similarly, people on bicycles are blowing through the light here as well.

And of course the vehicle reacts safely.

And, of course, there are people on the road who sometimes do things they don't know what they're doing, like a man who parks between two self-driving cars.

I have to ask, "What are you thinking?"

(Laughter) Well, I've covered a lot of things, so I'll just give you a quick rundown of one of them.

What we see is the scene where we are riding our bikes again. Down below, you'll notice that you can't actually see the person on the bike yet, but the car can. It's the little blue box over there, and it's coming from the laser data.

It's actually not that easy to understand. So what I'm trying to do is rotate that laser data and look at it. If you're good at looking at laser data, you'll see some points on the curve there. And that blue box is the person riding the bicycle.

Our traffic light is red, but the bike traffic light has already turned yellow, and you can see it in the image if you squint.

However, it turns out that the bicycle is about to pass through the intersection.

Our signal turns green, his signal turns red, and we expect this bike to come all the way over there.

Unfortunately the other drivers next to me weren't paying as much attention.

They started to move forward, and luckily this bike reacted and sidestepped and passed the intersection.

And we're off.

As you can see, we're making pretty exciting progress and at this point we're pretty confident that this technology will hit the market.

We test 3 million miles daily in simulators, so you can imagine what our vehicles experience.

We look forward to seeing this technology on the road. We also believe that the urgency is so great that pushing for automated driving rather than a driver assistance approach is the right way to go.

As I am telling this story today, 34 people have died on the streets of America.

How fast can you get it out?

Well, it's a really complicated issue, so I can't say, but these are my two sons.

My eldest son is 11 years old, so in four and a half years he will be able to get his driver's license.

My team and I are working hard to prevent that from happening.

thank you.

(Laughter) (Applause) Chris Anderson: Chris, I have a question.

Chris Urmson: Of course.

CA: Sure, your car mind is pretty daunting.

There is a real debate going on right now about the debate between driver assistance and fully driverless driving.

That's why some companies, such as Tesla, are moving down the road of assisted driving.

What you mean is that it's a dead end. Because you can't just keep improving that route and at some point reach full driverlessness. Then, when the driver says, "It's safe here," and gets in the back, something ugly will happen.

CU: Yes. No, you're right. It's not that driver assistance systems become incredibly worthless.

They can save a lot of lives in the meantime, but it's the only way to see someone like Steve move and actually get to the final stage safely and see a transformative opportunity to change the city and relocate the parking lot and get rid of the city crater called the parking lot.

CA: We will be tracking your progress with great interest.

Thank you very much, Chris. Kyu: Thank you. (applause)

Since Aristotle defined the rules of tragedy some 2,500 years ago, the way we tell stories has naturally changed.

According to him, the role of storytelling is to imitate life and make us feel emotions.

And that's exactly the kind of storytelling that, as we know it, has done very well ever since.

But there are aspects of life that stories can never replicate.

It's the concept of choice.

Choices are a very important part of our lives.

We are defined as individuals by our choices.

Some of our decisions have very serious consequences and completely change the course of our lives.

But in plays, novels, and films, the writer makes all decisions for his characters in advance, and as spectators we can only passively observe the consequences of his decisions.

As a storyteller, I've always been fascinated by the idea of ​​recreating this concept of choice in fiction.

My dream was to put the audience in the shoes of the protagonist, make their own decisions, and in doing so tell their own story.

Finding a way to achieve this is what I've been doing for the last 20 years of my life.

Today, I want to introduce you to this new way of telling stories, one that has interactivity at its core.

Rather than expose the theory behind it, I thought it would be a great opportunity to do a bit of an experiment, albeit abstract and a bit boring.

I invite you here at TED to tell your own story.

So we prepared an interactive scene to play with.

I asked Vicky -- hello Vicky -- to control the main character.

And your role—you, the viewer—will be making choices.

I mean, Vicky and I don't know what's going to happen. Because everything is based on your decisions.

This scene is from the next game, Detroit: become human, and is set in the near future, where technology has made it possible to create androids that look exactly like humans.

We are in the shoes of an android character named Connor. As you can see, he can do some really fancy things with his coins.

Like all androids, he has a blue triangle on his chest and now Vicky controls this character.

She can walk, she can go anywhere, she can look around, she can interact with her environment, and now she can tell her own story by making choices.

So here we have the first option.

There are fish on the ground.

what should we do

Should I keep it or should I keep it?

Remember that you are pressed for time, so the sooner the better.

what should we do

Audience: Save!

David Cage: Save? Save the fish?

(video) (sound of fish jumping) DC: Let's go.

I have an android who likes animals.

Okay, let's move on.

Remember there is a hostage situation.

(Video) Woman: Please, please, save my little girl!

Wait -- are you sending an android?

Policeman: Okay, ma'am, go ahead.

Woman: You can't do that!

Why not send a real person?

DC: Well, she's not very happy.

Her daughter was taken hostage by an android and she is naturally in a state of shock.

Now you can continue exploring this apartment.

I see all the SWAT forces in place.

But first we have to find Captain Allen.

That's the first thing we have to do.

Again, we can go anywhere.

Vicky still controls the character.

Well -- oh, I think this is Captain Allen. he is on the phone

(Video) Connor: Captain Allen, my name is Connor.

I am an android sent from CyberLife.

Captain Allen: Fire at anything that moves.

Already shot down two men.

We could easily get it, but they were at the end of the balcony - if it fell she would fall.

DC: OK, we need to decide what we want to ask the captain.

what should we choose?

Weird name? Deviant behavior? mental shock?

(Video) C: Have you had any mental shocks lately?

Captain A: I have no clue. Are you related?

C: I need information to determine the best approach.

DC: Okay, second option. Maybe we can learn something.

What should I choose?

Audience: Action.

DC: OK, deviant behavior, Vicky.

(Video) C: Do you know if it's been behaving strangely since last time?

Captain A: Listen...it's important to save her.

DC: Okay, I'm not going to learn anything from this guy.

something has to be done

Let's go back to the lobby.

Oh wait, there's a room on the right side, Vicky, I think.

We may learn something here.

Oh, I have a tablet.

Let's see.

(Video) Girls: This is Daniel, the coolest android in the world.

Say hello, Daniel.

Daniel: Hello!

G: You are my best friend, we are always together!

DC: It's just one way to play a scene, but there are many other ways to play it.

Depending on the choices you make, we could have seen different actions, different results, and different results.

Now you can see what my job as an interactive writer is like.

Linear writers have to deal with time and space, but as an interactive writer I have to deal with time, space and possibilities.

I need to manage a large tree structure where each branch is a new variation of the story.

You have to think about all the possibilities in a particular scene and imagine everything that could happen.

I have to deal with thousands of variables, conditions and possibilities.

As a result, such an interactive script would be between 4 and 5,000 pages, compared to about 100 pages for a movie script.

Then you will know what this work is about.

But in the end, I think the experience is very unique. Because it is the result of a collaboration between the writers who create this narrative landscape, and the players who make their own decisions, tell their own stories, and who are not only co-writers, but co-stars and co-directors of the story.

Interactive storytelling is a revolution in how stories are told.

With the emergence of new platforms such as interactive television, virtual reality and video games, it could become a new form of entertainment and possibly a new form of art.

I am confident that in the years to come, we will see more and more inspiring, meaningful and interactive experiences created by a new generation of talent.

This is the medium waiting for Orson Welles and Stanley Kubrick, and I have no doubt that they will soon appear and be recognized as such.

I believe that interactive storytelling can be like 20th century cinema: a game changing art.

thank you.

(applause)

In childhood, anything is possible.

Keeping it up is often a challenge as we grow.

And at the age of 4, I had my first chance to go sailing.

I will never forget the excitement of closing the coast.

I will never forget the feeling of adventure when I first boarded a boat and gazed into her tiny cabin.

But the most amazing feeling was the feeling of freedom, the feeling we had when we hoisted her sails.

As a four-year-old, it was the greatest feeling of freedom I could have ever imagined.

I made up my mind there and decided that someday I would somehow make it around the world.

So I did everything I could in my life to get closer to that dream.

At age 10, I was saving change for school dinner.

I had mashed potatoes and baked beans every day for eight years, and they cost me fourpence each, and the gravy was free.

Every day I piled my change into a piggy bank, and when the pile reached £1, I dropped it into it and crossed out one of the 100 squares I drew on paper.

Finally bought a small dinghy.

I spent hours in the garden sitting on it dreaming about my goals.

I read all kinds of books about sailing, but eventually school told me I wasn't smart enough to be a veterinarian, so I dropped out of school at 17 and started a sailing apprenticeship.

So, just four years later, imagine how it felt to be sitting in a boardroom in front of someone you knew would make that dream come true.

I felt that my life hung on that moment. And to my disbelief, he said yes.

And when I was at my first design meeting to design a single-handed, non-stop, round-the-world ship, I couldn't contain my excitement.

From the first encounter to the finish of the race, it was everything I imagined.

Like a dream, there were some amazing parts and some tough parts.

I missed an iceberg by 20 feet.

I climbed nine times to the top of the 90 foot mast.

We were shocked in the Southern Ocean.

But the sunsets, wildlife, and secluded locations were truly breathtaking.

After three months at sea, I was only 24 and finished second.

I liked it so much that I decided to go around the world again in half a year. This time, instead of racing, I aimed to become the fastest person to circumnavigate the world non-stop.

Well, for this we needed another ship - bigger, wider, faster and more powerful.

To give this boat some scale, I was able to climb inside her mast to the top.

75 feet long and 60 feet wide.

I affectionately called her Moby.

She was a polyhull.

When we built the ship, many tried, but no one had sailed around the world single-handedly, non-stop. But while we were building the ship, the French got on a boat that was 25% bigger than her and not only did it, but they cut the record from 93 days to 72 days.

The hurdles are now much higher.

And these boats were a lot of fun to sail.

This was a training voyage off the French coast.

I was one of the five crew members on board, so I know this very well.

From where everything was fine to when the window plunged into the water and the world went black in five seconds, those five seconds flew by.

See how far the sea is below.

Imagine diving alone into icy water thousands of miles from land in the Antarctic Ocean.

It was Christmas day.

I was heading towards the Antarctic Ocean below Australia.

The situation was dire.

I was approaching a part of the ocean 3,000 miles from the nearest town.

The closest land would be Antarctica, and the closest people would be those stationed on the European Space Station above me.

(Laughs) You're really in the middle of nowhere.

If help is needed and you are still alive, it will take 4 days for the ship to arrive and 4 days for it to return to port.

No helicopters can arrive from there, and no planes can land there.

We are preparing for a huge storm.

The wind was blowing at 80 knots in it, far too strong for the boat and me to handle.

The waves were already 40-50 feet high, and the spray from the crumbling crests was blown horizontally like snow in a blizzard.

If we don't sail fast enough, the storm will swallow us up and capsize us or shatter us to pieces.

We were literally risking our lives, doing it with the edge of a knife.

The speed I desperately wanted came with danger.

We all know what it feels like to drive a car at 20, 30, 40 mph.

Not too stressful. I can concentrate.

You can turn on the radio.

Accelerate from 50, 60, 70 mph to 80, 90, 100 mph.

Now you have white joints and a steering wheel.

Then take that car off the road at night and remove the wipers, windshield, headlights and brakes.

This is what the Antarctic Ocean looks like.

(Laughter.) (Applause.) You can imagine how difficult it would be to sleep in those conditions, even as a passenger.

But you are not a passenger.

Alone in a barely standing boat, you have to make all the decisions on board.

I was completely exhausted, both physically and mentally.

8 sail changes in 12 hours.

The mainsail weighed three times my weight, and every time I changed sails, I would drop to the floor sweating as the chilly Antarctic air burned my throat.

In the world, however, the lowest lows are often contrasted with the highest highs.

After a few days, we hit rock bottom.

Against all odds, we were able to break records in that recession.

The skies cleared, the rain stopped, and with our heartbeat the terrible sea around us turned into the most beautiful moonlit mountains.

It's hard to explain, but heading there puts you in a different mode.

Your boat is everything in your world and all you have is what you take with you when you leave.

If I were to tell you now, "Go to Vancouver and find everything you need to survive the next three months," that would be quite a task.

Food, fuel, clothing, even toilet paper and toothpaste.

That's our job, and when we leave, we'll manage it down to the last drop of diesel and the last packet of food.

Never in my life have I been able to better understand the definition of the word "finite."

What we have there is all we have.

No more.

And until I broke that record and got off the boat at the finish line, never in my life did I replace the finite definition I felt on board with something other than sailing.

(Applause) Suddenly the dots connected.

Our global economy is no exception.

It is entirely dependent on finite matter that exists only once in human history.

It's like having two choices when you see something unexpected under a stone. Either put that stone aside and learn more about it, or put it back and continue your dream job of sailing around the world.

I chose the first one.

I put that aside and started a new learning journey by talking to chief executives, experts, scientists and economists to understand how the global economy works.

And my curiosity has taken me to some special places.

This photo was taken inside the burner of a coal-fired power plant.

I was fascinated by coal. Coal was fundamental to the world's energy needs and very close to families.

My great-grandfather was a miner and spent 50 years of his life underground.

This is a picture of him, but when you look at it, you see someone from another era.

No one wears trousers with a waistband that high these days. (Laughter) But those are my and my great-grandfather's ears, and by the way those are not his real ears. (Laughter) We were close. I remember sitting on his lap and listening to him talk about mines.

He spoke of underground friendships and the fact that miners saved sandwich ears to give to the ponies they worked with underground.

It seemed like yesterday.

Then, in the middle of my learning journey, I landed on the World Coal Institute website. In the middle of its website, it said, "We have about 118 years of coal left."

And I thought to myself, this is far beyond my lifetime, and it's a much bigger number than oil projections.

But I did the math and found that my great-grandfather was born exactly 118 years earlier that year, and I sat on my grandfather's lap until I was 11, and I realized that it was nothing, both temporally and historically.

And it made me make decisions I never thought I would make. It's time to leave the sport of solo sailing behind and focus on the biggest challenge I've ever encountered: the future of the global economy.

And I quickly realized that it wasn't just about energy.

It was also a document.

In 2008, I covered a scientific study investigating how many years it takes to extract valuable substances from the ground. Copper, 61 years. tin, zinc, 40; silver, 29;

These numbers aren't exact, but we knew the material was finite.

They only exist once.

Yet the speed at which these materials were used increased rapidly and exponentially.

All over the world, we have virtually seen 100 years of price declines for these basic commodities erased in just 10 years as more people own more things.

And this affects us all.

This has resulted in huge price volatility, with raw material prices rising by €500 million for the average European automaker in 2011, wiping out half of its operating profit due to factors completely beyond its control.

And the more I learned, the more my own life began to change.

I travel less, do less, use less.

Fewer things to actually do felt like what we had to do.

But it was unsettling for me.

it wasn't right.

I felt like I was buying time.

We were pushing things a little further.

Changing everyone won't solve the problem.

It doesn't fix the system.

It was essential in transition, but what fascinated me was transition to what. What actually works?

I realized that the system itself, the framework in which we live, was fundamentally flawed, and ultimately that our operating system, how our economy works, and how we build our economy, is itself a system.

At sea it was necessary to understand a complex system.

I had to take multiple inputs, process them, and understand the system to win.

I had to figure it out.

And then I looked at our global economy and realized that it was that system too, but it's effectively a system that can't operate in the long run.

And then we realized that for 150 years we had perfected what is essentially a linear economy. There, materials are taken from the ground, something is made out of it, and eventually the product is thrown away. Of course, some of it is recycled, but it's not by design, it's an attempt to get as much as possible out of the end.

This is basically an economy that cannot be run in the long term, and knowing that supplies are finite, why should we build an economy that creates waste and uses things up effectively?

Life itself has existed for billions of years, continuously adapting to use matter effectively.

It's a complex system, but there's no waste in it.

Everything is metabolized.

It's never a linear economy, it's a circular economy.

And I felt like a child in the garden.

For the first time in this new journey, we knew exactly where we were going.

If we can build an economy that uses things instead of using them up, we can build a future that really works for the long term.

I was excited.

This was something to work on.

We knew exactly where we were going. We needed to figure out how to get there, and it was with this very mind in mind that we founded the Ellen MacArthur Foundation in September 2010.

Many schools of thought have fed our thinking and pointed to this model, including industrial symbiosis, the performance economy, the sharing economy, biomimicry, and of course, cradle-to-cradle design.

Materials are defined as either technical or biological, and waste is perfectly engineered, resulting in a fully functioning system in the long run.

So what will this economy look like?

Maybe we won't buy the fixtures, but we will pay for the light service, the manufacturers will reclaim the materials, and we will replace the fixtures once they have a more efficient product.

What if the packaging was so non-toxic that it dissolved in water and was eventually drinkable?

What if the engine could be remanufactured and the materials of construction could be recovered to significantly reduce energy demand?

What if we could salvage the components from the circuit board and reuse them, and in a second stage we could essentially recover the material within the board?

What if you could collect food waste and human waste?

What if we could turn it into fertilizer, heat, energy, and ultimately reconnect our nutrient systems and rebuild our natural capital?

And cars, what we want is to move.

We don't need to own the materials in it.

Will cars in the future become services and provide us with mobility?

All of this sounds amazing, but these are not just ideas, they are realities today, at the forefront of the circular economy.

What lies ahead of us is to expand and scale them up.

So how do we go from linear to circular?

Well, the Foundation team and I thought you might want to work with world-class universities, world-class companies, world's largest conference platforms, and governments.

We thought you might want to work with a good analyst to ask the question: "Can the circular economy decouple growth from resource constraints?"

Can the circular economy rebuild natural capital?

Can the circular economy replace the current use of chemical fertilizers?”

The answer to decoupling is yes, but it can also replace your current fertilizer usage by a staggering 2.7 times.

But what inspires me most about the circular economy is its ability to inspire young people.

When young people look at the economy through a circular lens, they see entirely new opportunities on the very same horizon.

They can use their creativity and knowledge to rebuild entire systems. It's available right now, and the sooner you do this, the better.

So can we achieve this while they are alive?

Is it actually possible?

I think so.

If you look at my great-grandfather's life, anything can happen.

When he was born, there were only 25 cars in the world. they had just been invented.

When he was 14, we flew for the first time ever.

Today, 100,000 charter flights are operated daily.

When he was 45, we built our first computer.

A lot of people said it wouldn't spread, but it did. Only 20 years later we turned it into a microchip, and there are thousands of chips in this room today.

Ten years before he died, we built the first mobile phone.

To be fair, it wasn't that mobile, but it's really mobile now, and when my great-grandfather left Earth, the internet arrived.

I can do anything now, but more importantly I have a plan.

thank you.

(applause)

As a matter of fact, I've been trying to think about my career since leaving the White House, and the best example of this is a cartoon in The New Yorker a few years ago.

This little boy looks up at his father and says, "Dad, when I grow up I want to be a former president."

(Laughter.) Well, I have been greatly blessed as a former president. Because I got to know so many people across this universe that few people in the world have ever done before.

Not only am I familiar with the 50 states of the United States, my wife and I have visited over 145 countries around the world, and the Carter Center has full-time programs in 80 countries around the globe.

And often when we go to a country, we not only meet kings and presidents, but also villagers living in the most remote parts of Africa.

So our overall commitment at the Carter Center is to promote human rights, and knowing the world as well as I do, I can say without a doubt that the greatest source of human rights violations on the planet is, strangely enough, under-reported: the abuse of women and girls.

(Applause.) There are several reasons for this, and I'll tell you that first.

First of all, there is the misunderstanding of religious scriptures and scriptures such as the Bible, Old Testament, New Testament, Koran, etc., which are now misunderstood by those in high positions in synagogues, churches and mosques.

And they interpret these rules in such a way that in God's eyes women are relegated to second place in comparison to men.

This is a very serious problem. usually not picked up.

Many years ago, in 2000, I was a Baptist, Southern Baptist, for 70 years. Mind you, I still teach Sunday School every Sunday. As I will be teaching this Sunday, it was decided at the 2000 Southern Baptist Convention that women should play a second position, a position subordinate to men.

So they in effect issued a decree banning women from becoming priests, clergymen, church deacons, or military chaplains. If a woman teaches a classroom at the Southern Baptist Theological Seminary, she cannot tell that there are boys in that classroom. Because there are over 30,000 verses in the Bible that say women should not teach men.

But fundamentally, the scriptures are misunderstood to keep men in a dominant position.

This is a universal problem. Because men can use that power to say, for example, if an abusive husband or employer tries to cheat a woman, why should they treat women equally if they are not equal in the eyes of God?

Why should we pay the same wages for the same kind of work?

Another very serious problem that gives rise to this problem is the use of excessive violence, which has increased greatly around the world.

For example, in the United States, there has been a significant increase in the imprisonment of the poor, mostly blacks and minorities.

When I was governor of Georgia, 1 in 1,000 Americans was in prison.

Currently, 7.3 per 1,000 people are in prison.

That's a 7x increase.

And since I left the White House, the number of black women in prison has increased by 800 percent.

Also, we have [the only country] that is the developed country on the planet that still has the death penalty.

And we rank among the countries that have violated all aspects of human rights the most in encouraging the death penalty.

We're in California right now, and I learned just the other day that California spent $4 billion to sentence 13 people to death.

All together, it will cost California $307 million to send the executioners.

Nebraska just this week passed a law to abolish the death penalty because it costs so much. (Applause.) So resorting to violence and abuse against the poor and the powerless is another cause of increased abuse of women.

Let me describe just a few of the abuses against women that concern me most. As you know, I have limited time, so I will be very brief.

One is genital mutilation.

Although genital mutilation is a horrific practice and unknown to American women, in some countries, many countries, when a baby girl is born shortly after birth, the genitalia are completely cut off with a so-called cutter with a razor blade, and the outer part of the female genitalia is removed in a non-sterile manner.

And in more extreme, but not very rare, cases, the opening is sewn up so that the girl can only urinate or menstruate.

And later, when she gets married, the same cutter breaks in and opens the orifice so she can have sex.

It's against the law in most countries, but it's not uncommon.

In Egypt, for example, 91 percent of women living in Egypt today have undergone such a form of sexual mutilation.

In some countries, over 98% of women are cut that way before reaching maturity.

This is a terrible pain for all women living in those countries.

Another very serious problem is honor killings, where families who also misunderstand the scriptures (there is nothing in the Qur'an mandating this) will execute girls if they are raped, or if they marry a man whose father does not approve, or even if they are dressed inappropriately.

And because this is done by her own family, when a girl brings the so-called disgrace to her family, it turns them into murderers.

A recent United Nations analysis in Egypt showed that fathers, uncles and brothers are responsible for 75% of girls' murders, but women are responsible for 25% of murders.

Another problem in the world that concerns women in particular is slavery, or human trafficking as it is called today.

About 12.5 million people were sold into slavery from Africa to the New World during the 19th and 18th centuries.

Thirty million people are currently living in slavery.

The U.S. State Department, now obligated by Congress to submit an annual report, reports that 800,000 people are sold into slavery across the border each year, and 80 percent of those sold are women and sold into sexual slavery.

Right now, 60,000 Americans live in human bondage, or slavery.

In Atlanta, Georgia, where the Carter Center is located and where I teach at Emory University, there are 200 to 300 women each month, people sold into slavery.

That's why we're number one in the country.

Atlanta is home to one of the busiest airports in the world, with many passengers from the Southern Hemisphere.

If a brothel owner wants to buy a girl with brown or black skin, she can buy one for $1,000.

Fair-skinned girls make several times that, and the average brothel owner in Atlanta and the United States can now make about $35,000 per slave.

Sex trafficking in Atlanta, Georgia, exceeds total drug trafficking in Atlanta, Georgia.

This is another very serious problem and the basic problem is prostitution. Because there are no brothels in America that are not known to local officials, local police officers, police chiefs, mayors, etc.

And this leads to one of the worst problems. That is, women are increasingly being bought and placed as sex slaves in every country of the world.

Sweden has a good approach to that.

About 15 to 20 years ago, Sweden decided to change the law so that while women who were sex slaves were no longer prosecuted, brothel owners, pimps and male clients were, and -- (applause) -- prostitution decreased.

In the United States, the situation is quite the opposite.

In the United States, 25 women are arrested for every man arrested for illegal sex trafficking.

I have already said that Canada, Ireland, Sweden, France and other countries are currently moving towards this so-called Swedish model.

It can be done.

This country has two great institutions that we all admire. It has an army and a great university system.

The military is currently analyzing the number of sexual assaults.

According to the last report I got, there were 26,000 sexual assaults in the military.

Only 3,000 people, or just 1 percent, are actually prosecuted. The reason is that the commander of any organization — a ship like my submarine, an army battalion or a Marine company — has the right by law to decide whether or not to prosecute a rapist, and of course they don't want anyone to know that sexual assaults are being committed under their command, so they don't.

That law needs to change.

About one in four girls who enroll in American colleges will be sexually assaulted before graduating. This is partly because of my book, but partly because of other things, and is currently receiving a lot of press coverage. Therefore, 89 American universities are now being denounced by the Department of Education under Title IX because university authorities have failed to take care to protect women from sexual assault.

More than half of rapes on college campuses are committed by serial rapists, according to the Justice Department, because outside the college system you can be prosecuted for raping someone, but once inside the campus you can rape with impunity.

they have not been charged.

That's what happens in our society.

Another very serious point about the abuse of women and girls, as you know, is the lack of equal pay for equal work. (Applause.) And although this is sometimes misunderstood, American women currently earn 23 percent less than men in full-time employment.

When I became president, the gap was 39 percent.

There has been some progress, partly because I was president and so on -- (applause) (laughter) -- but there hasn't been any progress in the last 15 years, so the difference over the last 15 years is about 23 to 24 percent.

This keeps happening.

If you take the Fortune 500 companies, 23 out of 500 have female CEOs, and not to mention those CEOs earning less on average than other CEOs.

Well, that's what is happening in our country.

Another problem with the United States is that it is the most belligerent country on earth.

After World War II, we have been at war with about 25 countries.

Sometimes soldiers fought on the ground.

Another time we flew over and bombed people.

Of course, there are now drones that attack people.

Since World War II, we have been at war with more than 25 countries.

It's been four years, I won't say when, but we didn't drop bombs, we didn't fire missiles, we didn't fire bullets.

But in any case, such things, resorting to violence, and misinterpreting the Bible are the causes and root causes of the abuse of women and girls.

There is another basic cause, which goes without saying. It's just that men generally don't care.

(Applause.) That's right.

The average man who might say, “I am against the abuse of women and girls,” quietly accepts the privileged position we occupy. And this is very similar to the times I knew as a child when segregation but equality existed.

Legally, racism existed for 100 years, from 1865, when the American Civil War ended, until the 1960s, when Lyndon Johnson passed a bill calling for equal rights.

But in that era, there were also plenty of white people who didn't think racism was okay, but they stayed silent because they enjoyed better jobs, unique access to jury duty, better schools, and all the other perks. It's the same one that exists today, because the average man really doesn't care.

They say they are against discrimination against girls and women, but they enjoy a privileged position.

And it is very difficult to get the majority of men controlling the university system, the majority of men controlling the military system, the majority of men controlling the governments of the world, and the majority of men controlling the great religions.

So what are the basic things we need to do today?

I think the best thing we can do today is that women in countries as strong as this, and in Europe and elsewhere where you come from, women who are influential and who have freedom of speech and action, need to take responsibility for themselves and demand more forcefully for the end of racism against girls and women around the world.

The average Egyptian woman doesn't say much about her daughters being genital mutilated or anything like that.

I didn't go into detail about that.

But I hope, through this conference, that every woman here will make your husband understand that abuse on college campuses, in the military, and in the job market of the future needs to protect your daughters and granddaughters.

I have 12 grandchildren, 4 children and 10 great-grandchildren. I think a lot about them and the plight they would face in America to have equal rights, not just if they lived in Egypt or a foreign country. I hope all of you will join me in being advocates for women and girls around the world and defending their human rights.

thank you very much.

(applause)

My colleagues and I are fascinated by the science of moving dots.

So what are these points?

Well, it's all of us.

And we shop and travel around the city and around the world while on the move at home and in the office.

And wouldn't it be great if we could understand all this movement?

If you can find a pattern, a meaning, an insight there.

And fortunately, we live in a time when we are very good at capturing information about ourselves.

So through sensors, video and apps, we can track our movements in incredible detail.

So, it turns out that sports are one of the best places to get movement data.

So whether it's basketball or baseball, football or any other kind of football, we're able to track stadiums and player movements down to the second.

So what we're doing is turning athletes into moving points, as you probably guessed.

So there are mountains of moving dots, and like most raw data, it's hard to work with and not very interesting.

But there is something that a basketball coach, for example, would like to know.

And the problem is they can't know them because they have to watch every second of every match and remember and process it.

Humans can't do it, but machines can.

The problem is that the machine cannot see the game through the eyes of the coach.

At least not until now.

So what have we taught the machine to see?

So we started simple.

We taught pass, shot, rebound and more.

What most casual fans know.

Then we moved on to something a little more complicated.

Events such as post-ups, pick-and-rolls and isolations.

Even if you don't know them, that's okay. Most casual players probably do.

We are now at a point where the machine can understand complex events such as down screens and wide pings.

Basically, only experts know.

So we taught the machine to look through the eyes of a coach.

So how is this possible?

If you ask a coach to explain something like a pick and roll, they'll give you an explanation. Encoding it as an algorithm would be terrible.

The pick and roll is this dance between four basketball players, two on offense and two on defense.

And here's how it looks.

So you have a player offensive without the ball and he goes next to the guy who is guarding the guy with the ball and he stays there and you two move and something happens and free, it's a pick and roll.

(Laughter) That's another example of a terrible algorithm.

So if a disruptive player (called a screener) doesn't stop when you get close, it's probably not a pick and roll.

Alternatively, if he stops but doesn't stop near enough, it's probably not a pick and roll.

Or even if he goes near and stops, it's probably not a pick and roll if they do it under the basket.

Alternatively, I could be wrong and they could all be pick and roll.

It depends a lot on exact timing, distance and location, which is difficult.

So, fortunately, machine learning allows us to describe what we know beyond our capabilities.

So how does this work? Well, it's by example.

So we go to the machine and say, 'Good morning, machine.

Here are some picks and rolls and some that aren't.

Find out how to tell the difference. ”

And the key to all of this is finding features that enable isolation.

So if I were to teach you the difference between apples and oranges, you might say, "Why not use colors and shapes?"

The question we are trying to solve is what are they?

What are the main features that allow computers to navigate the world of moving dots?

Unraveling all these relationships to relative and absolute position, distance, timing and velocity is therefore really key to the science of moving dots, or spatio-temporal pattern recognition if we want to call it in academic terms.

Because, first of all, it has to sound difficult.

The point is, NBA coaches don't want to know if a pick and roll happened.

That's what they want to know how it happened.

And why is it so important to them? So let me give you a little insight.

The pick and roll has turned out to be perhaps the most important play in modern basketball.

And knowing how to execute it and how to defend it is basically the key to winning or losing most matches.

I found that there are so many variations of this dance that it is really important to identify the variations. That's why we need to make this really, really good.

Here is an example.

There are two offensive players and two defensive players preparing for the pick and roll dance.

Therefore, the person in possession of the ball can either accept or refuse.

His teammates can roll or pop.

The person guarding the ball can go over or under.

His teammates can show, play up to touch, play soft, and switch and blitz together. I didn't know most of these things when I started. It would be great if everyone could follow those arrows.

It would make our lives a lot easier, but it turned out to be very cumbersome to move around.

People are wildly fluctuating, and it is difficult to identify these fluctuations with a very high degree of accuracy in both accuracy and recall. Because that's what it takes to get a professional coach to trust you.

And we were able to do that despite all the difficulties with proper spatiotemporal functioning.

Coaches rely on the machine's ability to discern these changes.

Nearly every contender for this year's NBA championship is on the verge of using our software built on machines that understand how basketball works.

Not only that, but we've also provided strategy-changing advice to help teams win very important matches. It's very exciting because there are coaches in the league for 30 years who are happy to take advice from the machine.

And it's so exciting, it goes way beyond pick and roll.

Our computers started out simple, learned more and more complex things, and now know so much more.

Frankly, I don't quite understand what it does. Being smarter than me is nothing special, but we were wondering how the machine could know more than the coach.

Can we know more than humans know?

And it turns out the answer is yes.

Coaches want their players to hit good shots.

So if I'm standing near the basket and there's no one nearby, that's a good shot.

If you're surrounded by defenders and standing far away, it's generally a bad shot.

But we never knew how good "good" was, or how bad "bad" was quantitatively.

until now.

So, once again, what you can do with the space-time feature, we went through all the shots.

You know, "Where's the shot?" What is the angle of the basket?

where are the defenders standing? how far are they?

what are those angles?

With multiple defenders, you can predict the type of shot by looking at the player's movements.

You can build a model that looks at all the velocities and predicts how likely this shot is in this situation.

So why is this important?

Shooting, which used to be one thing, can now be two things: the quality of the shot and the quality of the shooter.

Here we have a bubble chart. What is TED without bubble charts?

(Laughter) They're NBA players.

The size is the size of the player and the color is the position.

On the x-axis is shot probability.

The person on the left takes a difficult shot, and the person on the right takes an easy shot.

[y-axis] is firepower.

Good people are above, bad people are below.

For example, if you had a player who made 47% of their regular shots, that's all we knew before.

But today I can tell you that the player hits shots that the average NBA player makes 49 percent of the time, and that's 2 percent worse.

The reason it's important is that there are a lot of 47's out there.

So it's very important to know if the 47th player you're thinking of donating $100 million to is a good shooter with bad shots, or a bad shooter with good shots.

Understanding machines not only changes the way you look at your players, it changes the way you look at the game.

A few years ago at the NBA Finals, there was a very exciting game.

Miami was three points behind with 20 seconds remaining.

They nearly lost the championship.

A gentleman named LeBron James came out and took a three to tie the score.

he missed.

His teammate Chris Bosh grabbed the rebound and passed it to another teammate named Ray Allen.

He sank the three. went into overtime.

they won the match. they won.

It was one of the most exciting games in basketball.

And being able to know every second of every player's shot probability, knowing every second of their chances of getting a rebound, reveals this moment in a way never before possible.

Unfortunately, I can't show you the video.

But for everyone's sake, we recreated that moment about three weeks ago at a weekly basketball game.

(Laughter) And then I recreated the tracking that led to the insight.

So here we are. This is Los Angeles' Chinatown, the park we play every week, recreating a Ray Allen moment and all the chases associated with it.

So here is the shot.

I will show you the moment and all the insights of that moment.

The only difference is that it's us instead of the pro players and it's me instead of the pro announcers.

So be patient.

Miami.

down by three.

20 seconds left.

Jeff brings out the ball.

Josh catches and makes a three!

[Shoot probability calculation] [Shoot quality] [Rebound probability] Don't go!

[Rebound Probability] Rebound, Noel.

Return to Dahlia.

[Shot quality] Her 3-point shot -- bang!

A draw with 5 seconds remaining.

The crowd goes wild.

(Laughs) It was like this.

(Applause) Approximately.

(Applause.) That moment happened about nine percent of the time in the NBA, and we know that and a lot of other things.

I don't know how many times it took me to realize that.

(laughs) Okay, I will! It was four.

(laughs) As expected, Dahlia.

But that's not the only thing about the video and the insight you get into every moment of every NBA game.

It's the fact that you don't need a dedicated team to track your movements.

You don't have to be a professional player to get insight into your moves.

In fact, we move everywhere, so it doesn't even have to be about sports.

We move from home and office, shop, travel around cities and around the world.

What do we know? What do we learn?

Perhaps instead of identifying the pick and roll, the machine could identify the moment and let me know when my daughter took her first steps.

It could literally happen at any moment.

Perhaps we can learn how to make better use of buildings and plan cities better.

I believe that advances in the science of moving the dots will make us better, smarter and forward.

thank you very much.

(applause)

Five years ago, I took the TED stage to talk about my work.

But a year later, I had a terrible accident when I was walking out of a pub with friends on a dark night in Scotland.

As I was making my way through the woods, I suddenly felt a loud thud, then a second thud and fell to the ground.

I didn't know what hit me.

I later learned that when the garden gate opened, a wild deer ran along the road at breakneck speed and ran straight into me.

Its horn penetrated the trachea and esophagus, stopped in the spinal cord, and fractured the neck.

My best friend found me lying on the floor, rumbling through the hole in my neck for help.

And we made eye contact, and although I couldn't speak, she could understand what I was thinking.

And she said to me, "Just take a breath."

So while I was concentrating on my breathing, I felt a strong sense of calmness, yet I was certain I was going to die.

I've been doing the best I can in my life, so somehow I was happy with this.

So I just kept enjoying each breath as another moment, breathing in, breathing out.

An ambulance came, but I was still fully conscious and I'm a scientist, so I analyzed everything on the move, from the sound of the tires on the road, to the frequency of the streetlights, and finally to the street lights of the city.

And I thought, "Maybe I can survive."

And then I passed out.

After stabilizing in a local hospital, I was flown to Glasgow, where my throat was reconstructed and I fell into a coma.

And while in a coma, I experienced many alternate realities.

It was like a cross between Westworld and Black Mirror.

But that's a whole other story.

My local TV station broadcast the comatose Cambridge scientist live from outside the hospital, and I didn't know if she would live or die, walk or talk.

And a week later I woke up from my coma.

And that was the first gift.

And I had the gift of thinking, the gift of movement, the gift of breathing, and the gift of eating and drinking.

It took three and a half months.

But there was one thing I could never get back: my privacy.

Tabloids made articles about gender.

See, I'm transgender, but it's not a big deal.

My hair color and shoe size are much more interesting.

The last time I spoke here -- (applause) the last time I spoke here -- (applause) at TED, we didn't talk about it. Because it's boring.

And one Scottish newspaper carried the headline "Sex-swap scientist attacked by stag."

And so did the other five.

And for a moment I got angry.

But then I found my comfort zone.

And what ran through my mind was, 'They had sex with the wrong woman and they wouldn't know what hit them.

(laughs) I'm a gentle ninja.

I don't really know what a ninja does, but to me, a ninja can slip through shadows, crawl through sewers, jump over rooftops, and find himself behind you.

They don't show up with an army, they don't complain, they concentrate on the plan.

So while I was lying in a hospital bed, I came up with a plan to reduce the chances of them doing the same to others by paying the price of using the system as is and sacrificing my privacy.

I will tell 10 million people what they said to 1 million people.

Because when people are angry, they protect themselves.

So I didn't attack them and they were defenseless.

I wrote kind and gentle letters to these newspapers.

And Sun newspapers like UK's Fox News thanked me for my 'reasonable approach'.

I asked for no apology, no retraction, no money, just an admission that they broke their own rules and that what they did was wrong.

And in this journey, I started learning who they were and they started learning who I was.

And we actually became friends.

Since then, I've had a few glasses of wine with Philippa of The Sun.

And after 3 months we all agreed, a statement came out on Friday and that was it.

Or so they thought.

On Saturday, I saw a program on the evening news with the headline "Six National Newspapers Admit Error."

Then the anchor said to me, "But don't you think it's our job as journalists to sensationalize our coverage?"

And I said, "I was lying on the forest floor with deer bites.

Isn't that sensational enough? ”

(Laughter) And I was writing the headline now.

My favorite quote is "The deer trampled my throat and the press trampled my privacy."

It was the most read article on BBC News online that day.

And it was kind of fun.

And by the end of my week in media, I had started using my newfound voice and platform to spread messages of love and kindness.

And when I felt anger and hatred towards those news outlets and journalists, I had to identify my own internal prejudices against them.

And I had to meet and talk to these people without judgment.

I had to make myself understand them, but instead they began to understand me too.

Well, six months later they asked me to join the committee that regulates the press.

And a few times a year, when I have tea and dips in biscuits with people like Daily Mail editor Paul Daker, he asks me, "So, Kate, how have you been these past few months?"

And I respect them.

And I am now one of the three members of the public seated at the table. Not because I'm different, but because my voice matters, just like everyone else.

And ironically, I am sometimes asked to visit the printing presses of this declining industry. Because some people think that the technology I talked about here last time at TED, my interactive printing, could actually help save the printing press.

So be aware of your inner prejudices and make friends out of enemies.

thank you.

(applause)

I'm going to start today with a poem written by a friend of mine from Malawi, Irene Piri.

Irene is only 13 years old, but when I was reading the poetry book we wrote, I found her poetry very interesting and very motivating.

Now let me read it out.

She titled her poem "I will marry when I want".

(Laughter) “I will get married when I want to get married.

My mother cannot force me to marry.

My father cannot force me to marry.

My uncles, aunts, brothers and sisters cannot force me to marry.

No one in the world can force me to marry.

Get married when you want to get married.

Even if you hit me, drive me away, do me wrong, I will get married when I want to.

I will marry when I want to, but I will not marry before I am well educated or of age.

Get married when you want to get married. ”

This poem was written by a 13-year-old girl, and it may seem strange, but where me and Eileen are from, this poem I just read is a warrior's cry.

I am from Malawi.

Malawi is one of the poorest countries, very poor and gender equality is questionable.

Growing up in that country, I couldn't make my own life choices.

I couldn't even explore my personal chances in life.

Tell the story of two different girls, two beautiful girls.

These girls grew up under the same roof.

they were eating the same food.

Sometimes they even shared clothes and shoes.

However, their lives have taken two different paths with different endings.

Another girl is my sister.

My sister was only 11 when she got pregnant.

It hurts.

It not only hurt her, it hurt me too.

I was going through a rough time too.

In my culture, when you reach puberty, you go to initiation camp.

These introductory camps teach you how to please men sexually.

There is this special day they call 'Very Special Day' where men hired by the community come to the camp to sleep with the little girls.

Imagine the trauma these young girls go through every day.

Most girls end up pregnant.

You can also get HIV, AIDS, and other sexually transmitted diseases.

As for my sister, she got pregnant.

Currently, she is only 16 years old and has 3 children.

Her first marriage didn't work out, and neither did her second.

There's a girl like this on the other side.

she's amazing

(Laughter.) (Applause.) I call her great because she's great.

she is so wonderful

That girl is me (laughter) When I was 13, they said, 'You're grown up, you're grown up, you should go to initiation camp.'

I thought:

I am not going to the initiation camp. ”

Do you know what the women said to me?

"You are a stupid girl. You are stubborn.

You are not respecting the traditions of our society and community. ”

I knew where I was going so I said no.

I knew what I wanted in life.

When I was young, I had many dreams.

I wanted to get a good education and get a decent job in the future.

I imagined myself sitting in a big chair as a lawyer.

Such thoughts crossed my mind every day.

And I knew that someday I would be able to contribute something to my community.

But when I refused, the women said to me every day,

what about you? "

It was the music I used to listen to every day, and it was also the music I listened to every day by girls who weren't doing what the community asked them to do.

When I compared these two stories of mine and my sister, I said,

Why can't we change what has happened in our community over the years?"

That's when I called other girls who had kids, like my sister. Although they attend class, they have forgotten how to read and write.

I said, "Now let me remind you again how to read and write, how to hold a pen, how to read, how to hold a book."

The time I spent with them was wonderful.

Also, not only did I learn a little bit about them, they were able to tell me their personal stories and what they face every day as young mothers.

Then I thought, 'Why can't we take all these things that are happening to us and tell our mothers, our traditional leaders, that these things are wrong?

It was scary because these traditional leaders are already accustomed to what has been there over the years.

It's hard to change, but it's good to try.

So we gave it a try.

It was very difficult, but we persevered.

And what I'm trying to say here is that in my community, it was the first community after girls pushed traditional leaders so hard, and leaders stood up for us and said girls don't have to be married by the age of 18.

(Applause.) In my community, this was the first community to have an ordinance, and this was the first ordinance to protect girls in our community.

we didn't stop there.

we have moved forward.

We were determined to fight for girls, not only in my community, but in other communities as well.

We were in the Capitol when the Child Marriage Bill was introduced in February.

Every day, as members of parliament walked in, they kept saying, "Will you support this bill?"

We don't have much technology here, but we do have small cell phones.

So we said, "Why can't we get their phone number and text them?"

So we did. That was good.

(Applause.) So when the bill passed, we texted them, 'Thank you for supporting the bill.'

(Laughter.) And when that bill was signed into law by the President, that was a plus.

Currently, the legal age of marriage in Malawi is 18, between the ages of 15 and 18.

(Applause.) It's good that the bill passed, but let me just say this. In some countries where the legal age of marriage is 18, we hear women and girls screaming every day, right?

Every day, girls' lives are taken away.

Now is the time for leaders to honor their commitments.

Respecting this commitment means always keeping girls' concerns in mind.

We don't have to be treated second, but women, like you're in this room, need to know that we're not just women, we're not just girls, we're special.

We can do more.

And do you know that another important thing for Malawi, and not only for Malawi but for other countries, is that the laws that exist there are not laws until they are enforced?

Laws recently passed and existing in other countries need to be promoted at the local and community level where girls' issues are highly visible.

Every day girls face problems and challenges at the community level.

So if these young girls knew there were laws to protect them, they would be able to stand up and defend themselves because they knew there were laws to protect them.

And one more thing, girls and women's voices are beautiful and there are, but we can't do this alone.

Male advocates must jump in and step in and work together.

It's a collaborative effort.

What we need is what girls in other parts of the world need: a good education and above all, not getting married before the age of 11.

And moreover, we know that together we can change the legal, cultural and political frameworks that deny girls their rights.

I stand here today and declare that we can end child marriage within a generation.

This is the moment when girl and girl, and millions of girls around the world, can say, "I will get married when I want to."

(Applause.) Thank you. (applause)

For the last ten years, I've been studying how people organize and visualize information.

And I noticed an interesting change.

For a long time we believed in a natural hierarchy in the world around us. This is also known as the Great Chain of Existence, or "Scala naturae" in Latin. This is usually a top-down structure starting with the highest god, followed by angels, nobles, commoners, animals, etc.

This idea is actually based on Aristotle's ontology, which classifies everything known to man into a series of opposing categories. Kind of like the categories I see behind me.

Interestingly, however, over time this concept adopted a tree branching scheme that has come to be known as the Porphyrian tree, also considered the oldest tree of knowledge.

In fact, the tree branching scheme was such a powerful metaphor for communicating information that over time it became an important communication tool for mapping different bodies of knowledge.

We see trees used to map morality, such as the popular tree of virtues and tree of vices, along with beautiful illustrations of medieval Europe, as seen here.

We see trees being used to map consanguinity, the various blood ties between people.

You can also see trees used to map genealogy, perhaps the most famous prototype of the dendrogram.

I think many viewers have seen the family tree.

Many of you may have drawn your own family tree like this.

You can also see a tree that maps the legal system, the various decrees and decrees of kings and rulers.

And finally, of course, also a very popular scientific metaphor, we find that trees have been used to create maps of all species known to mankind.

And trees ended up being such a powerful visual metaphor because in many ways they really embody the human need for order, balance, unity and symmetry.

However, today we really face new complex and complex challenges that cannot be understood by simply adopting a simple tree diagram.

And now, new metaphors are emerging to replace trees in visualizing various knowledge systems.

It truly provides a new lens for understanding the world around us.

And this new metaphor is the network metaphor.

And we see a shift from trees to networks in many knowledge areas.

We see this change in the way we try to understand the brain.

We used to think of the brain as a modular, centralized organ with specific areas responsible for a series of movements and behaviors, but the more we learn about the brain, the more we think of it as a great musical symphony played by hundreds and thousands of instruments.

Here's a beautiful snapshot created by the Blue Brain Project, with 10,000 neurons and 30 million connections.

And it only maps 10% of the mammalian neocortex.

We see this shift in the way we try to understand human knowledge.

These are some notable Trees of Knowledge, or Trees of Science, by Spanish scholar Ramon Llull.

And Rull was indeed a pioneer, the first person to compare science to a tree, a metaphor we use every day when we say "biology is a branch of science" or "genetics is a branch of science."

But perhaps the most beautiful of all the Trees of Knowledge, at least to me, was created in 1751 by Diderot and d'Alembert for the French encyclopedia.

This was the bastion of the French Enlightenment, and this gorgeous illustration was featured in an encyclopedia table of contents.

And in effect, we map every area of ​​knowledge as a separate branch of the tree.

But knowledge is much more complicated than this.

These are two maps from Wikipedia showing interlinking articles. The left side is related to history and the right side is related to mathematics.

And I think that by looking at these maps and others made from Wikipedia (probably one of the largest rhizomatous structures mankind has ever created), we can really understand how much more complex and interdependent human knowledge is, like a network.

We see this interesting shift in the way we map social connections between people.

This is a typical organizational chart.

I'm sure many of you have seen similar charts at your company or at other companies.

This is a top-down structure, typically starting with the CEO at the top and drilling down to the individual employee at the bottom.

But humans are, in fact, sometimes all humans are unique in their own way, and may not play well under this very rigid structure.

I think the Internet is changing this paradigm significantly.

This is a great map of online social collaboration between Perl developers.

Perl is a popular programming language. Here you can see how different programmers actually exchange files and collaborate on specific projects.

Here you can see that this is a fully decentralized process. There is no leader in this organization, it is a network.

We see this interesting change when we look at terrorism.

One of the main challenges in understanding terrorism today is that we are dealing with decentralized, independent cells with no leader to lead the entire process.

Here you can see how the visualization is used in action.

The diagram behind me shows all the terrorists involved in the 2004 Madrid attacks.

What they did here is they actually split the network into three different years. This is represented by the vertical layers visible behind me.

And the blue line connects the people who joined the network each year.

So there are no leaders per se, but these people are probably the most influential people in that organization, those who know better about the past and future plans and goals of this particular cell.

We can also see this shift from trees to networks in the way we classify and organize species.

The illustration on the right is the only illustration that Darwin published in On the Origin of Species, which Darwin called the "Tree of Life".

In fact, there is a letter from Darwin to the publisher detailing the significance of this particular figure.

It was important to Darwin's theory of evolution.

But recently, scientists have discovered a dense network of bacteria on top of this tree of life. And these bacteria are actually tying together previously completely separate species into what scientists now call the web of life, or the network of life, rather than the tree of life.

And finally, we can really see this change again when we look at the ecosystems around our planet.

There is no longer such a simplistic predator-prey diagram that we all learned in school.

This is a more accurate depiction of the ecosystem.

This diagram, created by Professor David Lavigne, maps nearly 100 species that interact with cod off Newfoundland, Canada.

And I think it is here that we really understand the complex and interdependent nature of most of the many ecosystems on earth.

However, although this network metaphor is recent, in practice it has already taken many different shapes and forms and is growing as a visual taxonomy.

It's almost becoming a new language syntax.

And this is one aspect that really fascinates me.

These are actually 15 different typologies that I've collected over time and really demonstrate the immense visual versatility of this new trope.

Here is an example.

In the top band is radial convergence, a visualization model that has been very popular in the last five years.

The first project in the upper left is the gene network, then the network of IP addresses (machines, servers), and then the network of Facebook friends.

You probably can't find more different topics, but they use the same tropes, the same visual models to map the never-ending complexity of their subjects.

Here are a few more examples of the increasing visual classification of networks I've been collecting.

But networks are more than just a scientific metaphor.

As designers, researchers, and scientists attempt to map a variety of complex systems, they have influenced traditional art disciplines such as painting and sculpture in different ways, influencing many different artists.

And perhaps because networks have enormous aesthetic power and are so gorgeous, they have actually become a cultural meme, driving a new art movement I called "networkism."

And this influence in this movement can be seen in many ways.

This is just one of many examples where we can see the influence of science on art.

The example on the left is an IP mapping, a computer-generated map of IP addresses. Say it again -- server, machine.

And on the right is "Transient Structures and Unstable Networks" by Sharon Molloy, using oil and enamel on canvas.

And here are some Sharon Molloy paintings, gorgeous and intricate paintings.

And this is another example of an interesting cross-pollination between science and art.

On the left is "Operation Smile".

This is a computer-generated map of social networks.

And on the right is "Field 4" by Emma McNally, using only graphite on paper.

Emma McNally is one of the main leaders of the movement, creating these striking imaginary landscapes. You can clearly see the impact from traditional network visualization there.

But networkism doesn't just happen in two dimensions.

This is probably one of my favorite projects in this new movement.

I think the title says it all. The title is 'Galaxies forming along filaments, like droplets along the threads of a spider's web'.

And I found this particular project to be very strong.

It was created by Tomas Saraceno, who occupied these large spaces and used only elastic ropes to create these huge installations.

When you actually move through that space and bounce along the elastic rope, the entire network changes, much like a real organic network.

And this is yet another example of networkism that has reached an entirely different level.

This was created by Japanese artist Chiharu Shiota in her work "In Silence".

And Chiharu, like Tomás Saraceno, in many of her installations fills these rooms with this dense network, a dense web of elastic ropes and black wool and thread, sometimes containing objects, sometimes even people, as seen here.

But networks aren't just a new trend, and it's too easy to ignore it like that.

Networks really embody the concepts of decentralization, interconnection and interdependence.

And this new way of thinking is critical to solving the many complex problems facing us today, from deciphering the human brain to understanding the vastness of the universe.

On the left is a snapshot of the mouse's neural network. At this particular scale, they are very similar to ours.

And on the right is Millennium Simulation.

It was the largest and most realistic simulation of the growth of space structures.

We were able to reproduce the history of 20 million galaxies with an output of about 25 terabytes.

And, coincidentally or not, I find this particular comparison between the smallest scale of knowledge, the brain, and the largest scale of knowledge, the universe itself, really very striking and fascinating.

Because, as Bruce Maw once said, "When everything is connected to everything else, for better or worse, everything matters."

Thank you very much.

(applause)

It was the middle of summer, well past closing time at the bar in downtown Berkeley where my friend Polly and I worked as bartenders together.

I usually drink at the end of my shift, but that wasn't the case that night.

"I'm pregnant.

I don't know what to do yet," I said to Polly.

Without hesitation, she replied, "I have had an abortion."

Before Polly was born, no one told me she had an abortion.

I had just graduated from college just a few months ago and was in a new relationship when I found out I was pregnant.

When I thought about my choice, I honestly didn't know how to decide or what to base it on.

How will you know what was the right decision?

I worried that if I had an abortion, I would regret it later.

Growing up on a Southern California beach, I grew up in the middle of our country's abortion war.

I was born in the third anniversary trailer for Law vs. Wade.

We had Christians surfing in our community.

We cared about God, the underprivileged, and the sea.

Everyone was pro-life.

When I was a child, the thought of abortion was very sad and I thought that if I did get pregnant, I would never be able to have a baby.

And I did.

It was a step into the unknown.

But Polly gave me a very special gift. It's the knowledge that I'm not alone and the realization that abortion can be discussed.

Abortion is common.

According to the Guttmacher Institute, one in three American women will have an abortion in her lifetime.

But for decades, the abortion conversation in America has left little room for more than pro-life and pro-choice.

It's political and polarizing.

But while abortion is hotly debated, we still rarely talk about it with each other as fellow women or just the same human beings.

there is a gap.

What is happening in politics and what is happening in real life, the mentality of the battlefield in the gap between them.

"Are you for or against us?" stances take root.

This is not just about abortion.

There are many important issues that we cannot talk about.

So it's my life's work to find ways to move conflicts to the table.

There are two main ways to get started.

One way is to listen carefully.

And another way is to share stories.

So 15 years ago I co-founded an organization called Exhale and started listening to people who had had abortions.

The first thing we did was create a talkline that women and men could call for emotional support.

Believe it or not, there has never been anything quite like our service, free from judgment and politics.

We needed a new framework that could hold all the experiences heard on Talkline.

A feminist who regrets having an abortion.

Catholics who are grateful to her.

A personal experience that didn't fit neatly into either box.

We didn't think it was right to ask women to choose sides.

We wanted to show them going through this very personal experience that the whole world was on their side.

So we invented "ProVoice".

Beyond abortion, Professional Voices also tackles tough issues we've struggled with around the world for years, including immigration, religious tolerance, and violence against women.

We also address highly personal topics that are important only to you and your immediate family and friends.

They have a terminal illness, their mother has just passed away, and they have a child with special needs that they can't talk about.

Listening and storytelling are hallmarks of professional voice practice.

listening and storytelling.

That's very nice.

Sounds easy? all of us could do it.

It is not easy. Very difficult.

Professional voices are difficult because they talk about what everyone is fighting about and what no one wants to talk about.

I wish I could tell you that if you decide to become a professional voice actor, you'll find beautiful breakthrough moments and flowery gardens where listening and speaking can create wonderful "aha" moments.

I wish I could tell you that there is a feminist welcome party for you, or that there is a long-lost sisterhood of people who readily support you when you are accused.

But telling your own story when you feel like no one cares can be hurtful and exhausting.

And if we really listen to each other, we will hear things that demand that we change our own perceptions.

There is no perfect time or place to start a difficult conversation.

Not everyone thinks the same, shares the same lens, or knows the same history.

Now let's talk about listening and how to become a better listener.

There are many ways to become a better listener, and here are just a few.

One is to ask open-ended questions.

Ask yourself or someone you know, "How are you feeling?"

"What was it like?"

"What do you want now?"

Another way to become a better listener is to use introspective language.

If someone is talking about their own personal experience, use the language they use.

If someone says the word "baby" while talking about abortion, you can say "baby."

If you say "fetus", you can say "fetus".

If someone describes themselves as genderqueer, you can say "genderqueer."

It's cool when someone says they look like him but I'm her.

Please call that person her.

Echoing the words of those who share their stories conveys that we are interested in understanding who they are and what they are going through.

We hope that people will want to know us in the same way.

So, I will never forget hearing from a volunteer who attended a counselor meeting in Exhale and received many calls from Christian women talking about God.

Now, some of our volunteers are religious, but this one was not.

At first, it felt a little strange for her to talk about God to people who called her.

So she decided to get comfortable.

Then she stood in front of the mirror at home and said the word "God."

"god."

"god."

"god."

"god."

"god."

"god."

Again and again, until the words that come out of her mouth are no longer uncomfortable.

While chanting the word God didn't make this volunteer a Christian, it did make her listen much more to Christian women.

So another way to defend your opinion is to share your story. One of the risks you take on when sharing your story with others is that they might actually make different decisions in the same situation as you.

For example, if you're talking about an abortion, be aware that she may have had a baby.

She may have been put up for adoption.

She may or may not have told her parents or partner.

Even if you were feeling sad and lost, she may have felt safe and confident.

this is ok.

Empathy is born the moment we put ourselves in someone else's shoes.

That doesn't mean we all have to reach the same place.

What the proponents want is neither agreement nor identity.

It creates a culture and society that values ​​what makes us special and unique.

It respects what makes us human, our flaws and imperfections.

And this way of thinking allows us to see each other's differences with respect rather than fear.

And it creates the empathy we need to overcome all the ways we try to hurt each other.

Prejudice, shame, prejudice, discrimination, oppression.

A professional voice is contagious, so the more you practice it, the more it will spread.

So, I got pregnant again last year.

I was looking forward to the birth of my son.

And never before in my life have I been asked how I feel during my pregnancy.

(Laughter.) And no matter how I responded, whether I was feeling great and excited, or scared and completely distraught, there was always someone there to give me the "was there" response.

It was amazing.

It was welcome, but dramatically different from what I have experienced when talking about the complex emotions of abortion.

Pro-voice tells the real stories of real people who are influencing the way abortion and many other politicized and prejudiced issues are understood and discussed.

From sexuality and mental health to poverty and incarceration.

Our experiences can exist on a spectrum, far beyond the definition of a single right or wrong decision.

ProVoice enables support and respect for all by conducting conversations that focus on the human experience.

thank you.

(applause)

What if you could take medicines and vaccines to help wounds heal faster, the same way you cure a cold?

Today, when we have a surgery or an accident, we often end up in the hospital for weeks with scars and painful side effects from the inability to regenerate or regenerate healthy, undamaged organs.

I'm working on creating substances that tell the immune system to give the signal to grow new tissue.

Just as vaccines tell our bodies to fight disease, they can instead tell our immune system to build tissue and heal wounds faster.

Now, regenerating body parts out of nowhere may seem magical, but there are some creatures that can accomplish this feat.

Some lizards can regenerate their tails, humble salamanders can completely regenerate their arms, and even us mere mortals can regenerate livers that have lost more than half of their original mass.

To bring this magic a little closer to reality, I'm studying how our bodies heal wounds and build tissue with instructions from our immune system.

From a scraped knee to a nasty sinus infection, our immune system protects our bodies from danger.

I am an immunologist, and using my knowledge of our body's defense system, I was able to identify a key player in the fight against cuts and bruises.

When examining materials currently being tested for their ability to aid muscle regeneration, our team noticed that after treating damaged muscles with these materials, there were large numbers of immune cells in the materials and in the surrounding muscle.

So, in this case, instead of the immune cells rushing toward the infection to fight the bacteria, they are rushing toward the damage.

I discovered that a specific type of immune cell, called helper T cells, was present in the implanted material and was crucial to wound healing.

Now, just like when we were kids and tried to break a pencil and re-tape it back on, we can heal, but it may not be the most functional way and it leaves a scar.

So, without these helper T cells, instead of healthy muscle, fat cells develop within the muscle, and if there is fat within the muscle, the muscle will not be as strong.

Now, using our immune system, our bodies can grow without these scars and look the same as they did before the injury.

I am working on creating materials that alter the immune response to signal for the building of new tissue.

We know that whenever a substance is implanted in our body, our immune system reacts to it.

This can range from pacemakers to insulin pumps to the materials engineers use to build new tissues.

So when that substance, or scaffold, is placed in the body, the immune system creates a small environment of cells and proteins that can alter the behavior of stem cells.

Now, just as the weather influences our daily activities, such as going for a run or staying indoors to binge-watch TV shows on Netflix, the immune environment of the scaffold influences the way stem cells grow and develop.

Receiving the wrong signal, such as that of Netflix, produces fat cells instead of muscle.

These scaffolds are made of anything from plastics to naturally-derived materials, nanofibers of varying thicknesses, more or less porous sponges, and gels of varying hardness.

Additionally, researchers can make materials emit different signals over time.

So, much like a producer alters the set for Les Mis and Little Shop of Horrors, this Broadway Cell show can be orchestrated by giving Cells the correct stages, cues and props that can be altered for different organizations.

I combine specific types of signals that mimic how our bodies respond to injury to aid regeneration.

In the future, we may see scratch-resistant plasters, moldable muscle fillers, and even wound-healing vaccines.

Well, it's not like we can wake up tomorrow and recover like Wolverine.

Probably not even next Tuesday.

But with these advances, and working with the immune system to help build tissue and heal wounds, products that work with our body's defense systems to help regenerate are beginning to hit the market, and one day we may be able to keep pace with the salamander.

thank you.

(applause)

On the way here, the passenger next to me and I had a very interesting conversation during the flight.

He told me, "Looks like there are no more jobs in the US because we're just making up things like cat psychologists, dog whisperers, and tornado chasers."

A few seconds later he asked me, "So what are you doing?"

So I thought, "Peacebuilder?"

(laughter) I work every day to raise the voices of women and highlight their experiences and participation in peace processes and conflict resolution. Because of her work, she recognizes that the only way to guarantee the full participation of women around the world is to bring back religion.

Now this issue is very important to me.

As a young Muslim woman, I am very proud of my faith.

It gives me strength and conviction to do my daily work.

That's why I'm here in front of you.

But not only my own religion, but all the major religions of the world cannot overlook the damage done in the name of religion.

The misrepresentation, misuse, and manipulation of religious scriptures have impacted our social and cultural norms, laws, and daily lives, sometimes without even realizing it.

My parents immigrated to Canada from Libya in North Africa in the early 1980s and I am the middle child of 11 children.

Yes, 11.

But growing up, I saw my parents being pious and spiritual people, praying and praising God's blessings. So did I, of course, but especially so. (Laughter) They were sweet, funny, patient, endlessly patient, the kind of patience that having 11 kids forces you to have.

And they were fair.

I have never been influenced by religion through the lens of culture.

I was treated the same way and the same was expected of me.

I was never taught that God judges people differently based on their gender.

And my parents' understanding that God is a merciful and beneficial friend and provider shaped my view of the world.

Of course, my upbringing had additional advantages.

Being one of 11 children is Diplomacy 101. (Laughter) People still ask me where I went to school. "Did you go to the Kennedy Graduate School of Government?"

I look at them and think, 'No, I went to Muravit School of International Relations'.

It's very exclusive. You have to talk to your mother to enter.

Luckily she is here.

But being one of 11 children and having 10 siblings can tell us a lot about power structures and alliances.

It teaches concentration. You should speak faster or less. I always get lost in conversation.

It teaches you the importance of your message.

You have to ask the question the right way to get the answer you want, and you have to say "no" the right way to keep the peace.

But the most important lesson I learned growing up was the importance of being at the table.

When my mother's favorite lamp broke, I had to be there when she was being examined by who and how. Because I had to protect myself. Because if you don't, they'll point the finger at you and you'll be stranded before you know it.

Of course, I'm not speaking from experience.

In 2005, when I was 15, I graduated from high school and moved from Saskatoon, Canada, to Zawiya, a very traditional city in Libya, my parents' hometown.

Mind you, I've only been to Libya on vacation before, but for a 7-year-old girl, it was magical.

My relatives were very excited about eating ice cream and going on trips to the beach.

Turns out it's not the same as a young woman of 15 years.

I quickly got to know the cultural side of religion.

The words "haram", meaning religiously forbidden, and "ive", meaning culturally inappropriate, were casually exchanged, as if they meant the same thing and had the same effect.

And as I had more conversations with classmates, colleagues, professors, friends, and even relatives, I found myself questioning my role and my aspirations.

And despite the foundation my parents had provided for me, I questioned the role of women in my faith.

So at Muravit Graduate School of International Studies, we put a lot of emphasis on discussion, and rule number one is to do research. So I did too. And I was amazed at how easy it was to find women who were leaders in their beliefs, who were innovative, who were politically, economically and even militarily strong.

Khadijah funded the early Islamic movement.

If it wasn't for her, we wouldn't be here.

So why didn't we learn about her?

Why didn't we learn about these women?

Why were women relegated to a pre-teaching position in our faith?

And if we are equal in God's eyes, why not in human eyes?

For me, it all came back to lessons learned as a child.

The decision makers, those who have control over the message, sit at the table, but unfortunately in no faith in the world they are women.

Religious institutions are ruled by men, run by male leadership, and formulate policies in their likeness. Until we can completely change the system, we cannot realistically expect full economic and political participation of women.

Our foundation is broken.

In fact, my mother says you can't build a straight house on a crooked foundation.

When the Libyan Revolution broke out in 2011, my family was put on the front lines.

And in war, amazing things happen, mostly, very temporary cultural shifts.

And for the first time, I felt that my participation was not only accepted, but encouraged.

it was requested.

I and the other women were sitting at a table.

We weren't holding hands or mediums.

We were in decision making.

We were sharing information. we were very important.

And I wanted and needed the change to be permanent.

After all, it's not that easy.

It took only a few weeks for the women I had previously worked with to return to their former roles, most of them driven by words of encouragement from their religious and political leaders, most of whom cited religious scriptures as their defense.

This gave them public support for their views.

As such, it initially focused on women's economic and political empowerment.

I thought it would lead to cultural and social change.

After all, a little helps, but not much.

I decided to use their defense as an attack and began quoting and emphasizing Islamic scriptures as well.

In 2012 and 2013 my organization led the largest and most extensive single campaign in Libya.

We entered homes, schools, colleges and even mosques.

We have spoken directly to 50,000 people and hundreds of thousands more through billboards, TV commercials, radio commercials and posters.

And you're probably wondering how women's rights groups were able to do this in a community that has hitherto opposed our very existence.

I used scriptures.

I used Quranic verses and words from the Prophet Hadith, such as "Your best is best for their families."

"Don't let your brother oppress others."

For the first time, a Friday sermon led by a local community imam promoted women's rights.

They discussed taboo issues such as domestic violence.

Policy changed.

In certain communities, we were actually forced to even mention the International Declaration of Human Rights that you objected to because it was not written by a religious scholar. Well, the same principle is in our book.

Indeed, the United Nations has just imitated us.

By changing the message, we were able to provide a different narrative promoting women's rights in Libya.

It's something that's now being replicated internationally, and I wouldn't say it's easy, but believe me, it's not.

Liberals will say you are taking advantage of religion and will call you a bad conservative.

Conservatives will call you colorful.

You've heard it all: "Your parents would be very ashamed of you." They're big fans of mine, but it's also wrong to say, "You won't be there in time for your next birthday."

And I still strongly believe that women's rights and religion are not mutually exclusive.

But we have to take our table.

We must stop giving up our position. Silence allows for the continued persecution and abuse of women around the world.

By saying we fight for women's rights and use bombs and wars to fight extremism, we completely dysfunctional local communities that need to address these issues in order to be sustainable.

Challenging distorted religious messages is not easy.

Insults, ridicule and threats will be taken for granted.

But we have to do it.

We have no choice but to reclaim the human rights message that is the principle of our faith. It's not for us, it's not for the women in your family, it's not for the women in this room, it's not for the women out there, it's for the society that is transformed by women's participation.

And the only way we do it, our only option, is to get to the table and stay at the table.

thank you.

(applause)

One of my earliest memories is of trying to wake up one of my relatives and not being able to do so.

As a child, I didn't quite understand why, but as I grew up, I realized that my family had a drug addiction and later a cocaine addiction.

I've been thinking a lot about this lately. Part of the reason is that it's exactly 100 years since drugs were first banned in the US and UK, and later by the rest of the world.

A century has passed since we made the truly fateful decision to capture, punish and torment addicts. Because I believed it would be a deterrent for them. It will motivate them to quit.

And a few years ago, I was looking at some of the addicts I love in my life and wondering if there was a way I could help them.

And I realized that there are a lot of very basic questions I don't know the answer to, like what really causes addiction.

Why continue with this seemingly ineffective approach? Are there better alternatives to try?

So I read a lot of books about this problem, but I couldn't find the answer I was looking for. So I thought, okay, let's sit down and talk to different people around the world who live and study this and see if we can learn from them.

At first I didn't think I would end up traveling over 30,000 miles, but I ended up meeting a wide variety of people, from a transgender crack dealer living in Brownsville, Brooklyn, to a scientist who spends a lot of time giving mongooses hallucinogens to see if they like them (actually, it turns out they really like them, but only in very specific circumstances), to Portugal, the only country to have decriminalized all drugs, from cannabis to crack. to meet. .

And what really surprised me to realize is that almost everything we think we know about addiction is wrong, and if we start absorbing new evidence about addiction, I think we'll have to change a lot more than just drug policy.

But let's start with what we think we know, what I thought we knew.

Now let's think about the middle row.

Imagine you went out with heroin three times a day for 20 days.

Some of you seem a little more enthusiastic about this prospect than others.

(Laughter) Don't worry, this is just a thought experiment.

Imagine you did that.

what will happen?

Well, we have a story about what happens that has been told for a century.

Because heroin contains chemical hooks, we think that after taking it for a while, the body becomes dependent on it and physically needs them, and by the end of those 20 days, we're all addicted to heroin. right?

I thought so too.

The first time I noticed the fact that something was wrong with this story was when it was explained to me.

If I walked out of this TED talk today and got hit by a car and broke my hip, I would be rushed to the hospital and overdosed on diamorphine.

Diamorphine is heroin.

Because what you buy from drug dealers is tainted, it's actually much better heroin than what you buy on the street.

In fact, it contains very little heroin, but what you get from a doctor is medically pure.

And you will be given it for quite a long time.

There's a lot of people in this room, you may not be aware, you're taking a fair amount of heroin.

And for anyone watching this anywhere in the world, this is happening.

And if what we believe about addiction is true, and people are exposed to all kinds of chemicals, what happens? they should be addicts.

This is really carefully researched.

That doesn't happen. If your grandmother had a hip replacement, you'll realize she didn't come out as a drug addict. (Laughter.) And when I found out about this, it seemed so strange to me that, contrary to everything I'd been told and thought I knew, I didn't think it could be right until I met a guy named Bruce Alexander.

He is a professor of psychology in Vancouver who conducted a wonderful experiment that I think really helps us understand this issue.

Professor Alexander explained that part of the story of the concept of addiction in our minds comes from a series of experiments conducted in the early 20th century.

If you're feeling a little sadistic, you can do it at home tonight.

Catch a mouse, put it in a cage, and give it two bottles of water. One is plain water and the other is water laced with heroin or cocaine.

If you do this, the rats will most likely prefer chemical water and will most likely commit suicide immediately.

In the 70's, Professor Alexander came and saw this experiment and realized something.

You don't have to do anything other than use these drugs.

Let's try something different.

So Professor Alexander created a cage he named "Rat Park" which is basically a haven for rats.

Lots of cheese, lots of color balls, lots of tunnels.

The point is that they have many friends. they can have a lot of sex.

And they have water bottles, both plain and medicated.

But there is an interesting point here. In Rat Park they don't like medicated water.

They rarely use it.

None of them are forced to use it.

None of them overdose.

It's almost 100 percent overdose when you're in isolation, but 0 percent overdose when you're living a happy, connected life.

Now, when Professor Alexander saw this for the first time, he thought that maybe it was only about mice, that mice are very different from us.

It may not have changed as much as we would like, but fortunately, as you know, there were human experiments on the exact same principle going on at exactly the same time.

It was called the Vietnam War.

In Vietnam, 20 percent of all U.S. soldiers used heroin heavily, and the reports at the time really worried them. After all, they thought there would be hundreds of thousands of drug addicts on the streets of America once the war was over. It made perfect sense.

Now, the soldiers who used heavy heroin were chased home.

The General Psychiatric Archives did a very detailed study, but what happened to them?

95% of them just quit.

Now, if you believe the story about chemical hooks, it makes no sense at all, but Professor Alexander started to think there might be a different story about addiction.

He said what if the addiction wasn't caused by chemicals?

What if addiction is related to your cage?

What if addiction is an adaptation to the environment?

Seeing this, a professor from the Netherlands named Peter Cohen also said that this shouldn't be called an addiction.

Maybe we should call it a bond.

Humans have a natural instinct for bonding, and when we are happy and healthy we bond and connect with each other, but if we are traumatized, isolated, or overwhelmed by life and are unable to do so, we will still bond with something that will give us some measure of relief.

Well, it may be gambling, it may be porn, it may be cocaine, it may be cannabis, but you bond and connect with something, because that is our nature.

That's what we want as humans.

At first I found this very difficult to understand, but one way to help me think about this is, you know, I had a bottle of water by my seat.

I see many of you, and many of you carry around water bottles.

Forget about drugs. Forget the war on drugs.

Perfectly legally, all those water bottles could be vodka bottles, right?

We might all be drunk -- we might be drunk after this -- (Laughter) -- but we're not.

Well, you can afford the roughly £1 billion it costs to attend a TED talk, so I'm sure you can afford to drink vodka for the next six months.

You won't be homeless.

You're not going to do that, and the reason you don't is not because someone is stopping you.

It's because there's a bond or connection that makes you want to be there.

you have a job you love you have a loved one

You are building healthy relationships.

And I've come to think, and believe the evidence suggests, that the crux of addiction is the intolerance of being in one's life.

Now, this has very important implications.

The most obvious impact is on the war on drugs.

In Arizona, she was made to wear a T-shirt that read "I was a drug addict" and went out with a group of women who went gang gangs and dug graves while being jeered at by members of the public. Once the women are released from prison, they will have criminal records and will never be able to work in the legal economy again.

This is obviously a very extreme case of chain gangs, but in practice almost everywhere in the world treats addicts that way to some extent.

we punish them we shame them. We give them a criminal record.

We put barriers while they reconnect.

There was a wonderful man in Canada named Dr. Gabor Mate who told me that if he wanted to design a system that would exacerbate addiction, he would design that system.

Well, there was a place where I decided to do the exact opposite and went there to see how it worked.

In 2000, Portugal had one of Europe's worst drug problems.

One percent of the population was addicted to heroin. This is kind of surprising, and year after year they tried more and more the American way.

They punished people, stigmatized them, exposed them to more shame, and year after year the problem got worse.

Then one day, the prime minister and the opposition leaders got together and said, in short, we can't deal with a country with more and more heroin addicts.

Let's set up a committee of scientists and doctors to figure out what really solves the problem.

And they set up a committee headed by the wonderful Dr. Joan Gran to investigate all this new evidence. And when they came back they said, "We will decriminalize all drugs, from cannabis to policing," -- which is the next critical step -- "to take away all the money that was spent on severing addiction and spending it instead on reconnecting them to society."

And it's not what the US or UK think of as a drug treatment.

So they do residential rehabilitation and psychotherapy, which has a certain value.

But the biggest thing they did was the exact opposite of what we do. A large-scale job creation program for addicts and microloans for addicts to set up small businesses.

For example, you used to be a mechanic.

When they're ready, they'll go to the garage and say, if you hire this guy for a year, you'll pay him half his wages.

The goal was to ensure that every addict in Portugal had something to get out of bed in the morning.

And when I went to Portugal to meet addicts, they told me that as they rediscovered their purpose, they rediscovered their bonds and relationships with the wider society.

This year marks 15 years since the experiment began, and here are the results: According to the British Journal of Criminology, injecting drug use has fallen by 50 or 50 percent in Portugal.

Overdoses among addicts have dropped significantly, and so has HIV.

Addiction is significantly reduced in all studies.

One of the reasons we find this to work so well is that few people in Portugal want to go back to the old system.

Now, that's what it means politically.

In fact, I think all this research has some implications underneath.

We live in a culture where people feel more and more vulnerable to addictions of all kinds: smartphones, shopping, food, and more.

Before these negotiations began, as you all know, we were told that we were not allowed to use smartphones. And I have to say that many of you looked a lot like the addicts who were told that the dealership would be unavailable for the next few hours. (Laughter) Many of us feel that way, and as strange as it may sound to say, I've been saying that disconnection is a major factor in addiction, and it's strange to say that addiction is on the rise. Because you think we're the most connected society ever, sure.

But more and more I suspect that the connections we have or think we have are a kind of parody of human connections.

When you face a crisis in your life, you realize something.

Your Twitter followers aren't sitting with you.

It's not your Facebook friends that can help you turn things around.

It is a real friend with whom you have a deep, nuanced, textured, and direct relationship. There is research I learned from environment writer Bill McKibben. I think this tells us a lot about this.

It surveyed the number of close friends the average American believes they can count on in a crisis.

Their numbers have been steadily declining since the 1950s.

Private home floor space is steadily increasing, and I think it's kind of a metaphor for the choices we've made as a culture.

We traded floor space for friends, and traded things for connections. As a result, we have become one of the loneliest societies ever.

And Bruce Alexander, who conducted the Rat Park experiment, said that in addiction we are always talking about individual recovery, and it is right to talk about it, but we need to talk more about social recovery.

Something has gone wrong with us, both individually and collectively, and we have created a society where for many people life seems more like an isolated cage than a rat park.

To be honest, this is not why I joined it.

I didn't try to discover anything political or social.

I wanted to know how I could help my loved ones.

And when I came back from this long journey and learned all this, I turned to the addicts in my life. And quite frankly, it's hard to love an addict. I know a lot of people in this room.

You often get angry, but I think one of the reasons this debate is so intense is because it's in each of us's minds, right?

Everyone sees someone with an addiction and wishes that someone would stop them.

And I think the script that teaches us how to deal with addicts in our lives is represented by the reality show "Intervention." You've probably seen it before.

I think all of our lives are defined by reality shows, but that's just another TED Talk.

If you've seen the show "Intervention," it's a very simple premise.

When you catch an addict, gather all the people in their life together, and confront what they're doing, they say, if you don't tune in, we're going to cut you.

So what they do is take away the connection with the addict, threaten it, and make it dependent on whether the addict behaves the way they want.

And I started thinking and I started to see why that approach didn't work, and I started to think it was like bringing the logic of the War on Drugs into our private lives.

So I wondered how I could become Portuguese.

And what I'm trying to do now, though I wouldn't say it's consistent or easy, is to tell the addicts in my life that I want to connect with them more, and tell them I love you whether you use or not.

I love you no matter what state you are in. Because if you need me, I love you and I don't want you to feel alone or lonely.

And the core of that message is that you are not alone, we love you. It has to be at every level of our response to addicts – socially, politically and personally.

For 100 years we've been singing war songs about addicts.

I think we should have been singing love songs to them from the beginning, because the opposite of addiction is not abstinence.

The opposite of addiction is connection.

thank you.

(applause)

Jeannie, Will, and Adina are three seniors who have a special relationship.

They see their bond as a shield against the loneliness of old age.

I first met them at a nursing home in Los Angeles, where I spent three years taking pictures.

I saw them approaching the gate one night and felt an immediate connection with them.

I didn't know the details of their love triangle, but instinctively I felt compelled to find out who they were.

When I questioned the nurse the next day, she said, "Oh, you're talking about the threesome."

(Laughter) I was intrigued.

(Laughter) The trio set out on daily adventures to coffee and donut shops, bus stops and street corners.

I soon learned that the purpose of these outings was to seek solace and meaning.

The trio tried to combat alienation by literally blending into the public road.

But no one saw them, even with their arms crossed.

We often think that as we grow older, we lose the desires we had when we were younger.

In fact, when I met this trio as a teenage photojournalist, I thought their behavior reflected a fear of exclusion and a desire for intimacy that I also had.

I sympathized with their invisible presence. It haunted me as a child, but it has become my greatest asset as an immersive documentarian because it allows me to fade into empathy.

Walking the streets of Hollywood, where screenwriters, actors and filmmakers congregate, the trio were envisioned to be as invisible as their predecessors.

I ask myself, "Why aren't other people seeing these three people?"

Why am I the only one who sees them? ”

Years later, when I started sharing this work with the public, I realized that people were uncomfortable with the story.

Perhaps it's because this trio doesn't assume conventional notions related to love, romance, and partnership.

They never made public appearances and were shunned by their peers.

They wanted to belong somewhere, but they only seemed to belong to each other.

I also wanted to belong somewhere.

And my camera was the catalyst that allowed me to belong anywhere.

But beyond challenging sociocultural norms about the elderly, the trio shed light on fear of remoteness.

At the end of each day, they return to their respective nursing homes.

Beneath their loneliness lies a desire for community and people.

There was a sense that they each yearned for their own tribe, but that comfort is compromised as Will can't commit to one woman.

One day, as I was sitting in my apartment with Jeannie, she said to me, "It's awkward to share Will.

Relationships between men and women are private.

It's a couple, not a trio. ”

My process is basically spending years together as an observer and resident to become the people I document, create a safe space, and then go into hiding.

I met this trio when I was about 17 and followed them for 4 years.

In fact, adolescence and old age are strikingly similar when looking at the breakdown of social development. Because both adolescence and old age are periods of identity confusion.

I sympathized with the women.

But Will also made me aware of the division within me.

Each of us is a divide that often arises about what we crave and the reality of our situation.

Before filming this series, I knew each other and was in love with two different people who were in contention.

But at the same time, like Genie and Adina, I knew what it was like to be at the bottom of the triangle and ask myself, "Why am I not good enough?"

When I looked through the viewfinder, I saw three old men. And no matter how old we are, we can no longer deny that each of us is trying to fill the proverbial hole through others.

Perhaps the discomfort of watching the story of Genie, Will, and Adina is a real reminder that even at the end of life, we may never reach the fantasy we envisioned ourselves.

Thank you for listening.

(applause)

I love trees and I am very lucky that we live near a wonderful arboretum and I usually go there with my wife on Sundays and now I climb trees and play hide and seek with my 4 year old.

The second school I went to also had a big tree, a wonderful tulip tree. I think it was probably the largest in the country. Also, there were a lot of nice bushes and plants around it and around the playground.

One day, some of my classmates grabbed me, took me into a bush, and stripped me of my clothes. I was attacked I was abused. And this happened suddenly.

Well, the reason I said that is because then I thought - yes, I went back to school - I felt dirty. I felt betrayed. I was ashamed, but mostly, mostly, I felt helpless.

And 30 years later, I was sitting on an airplane next to a woman named Veronica from Chile. We were on a human rights tour. She started telling me what it was like to be tortured. From my very privileged position, this was the only point of reference for me.

It was a great learning experience. Because for me human rights was something that interested me part-time, but mainly what happened to other people over there.

But in 1985, Bono called me and you know he's a great singer, but he's a great hustler, and -- (laughs) -- a guy that's hard to say no, and he said, you know, right after I sang a Biko song, he was going to tour with Amnesty, and you had to be on it. In fact, that was the first time I went out and started meeting people who had seen their family members being shot in front of them. Having my partner thrown out of the plane into the ocean and suddenly this world of human rights came into my world and I couldn't leave quite like I used to.

So I took this tour for Amnesty and took over Bono's work in '88 to try and learn how to hustle.

I didn't do so well, but I was able to get Youssou N'Dour, Sting, Tracy Chapman and Bruce Springsteen to travel around the world for Amnesty International. It was a great experience.

And once again I had an exceptional education and it was really the first time I had met so many of these people in different countries and these human rights talks got so physical that again I was so comfortable I couldn't walk away.

But what really surprised me was that I had never imagined that a person could suffer in this way and then their entire experience and story could be denied, buried and forgotten.

And whenever there were cameras and video cameras and film cameras around, it seemed very difficult for those in power to bury this story.

And Reebok set up a foundation after the Human Rights Now tour, where the decision was made. Well, a few years ago we proposed setting up a department to provide cameras to human rights activists.

It didn't really go anywhere, but then the Rodney King affair happened, and people thought, okay, if we put cameras in the right places at the right time, some people could actually start doing things, campaigning, being heard, telling people what was going on.

That's why WITNESS was started in 1992, and since then cameras have been provided to over 60 countries.

And we work with activist groups to campaign and help them tell their stories. In fact, we'll show you one of our recent campaigns soon. Sorry, this is a story from Uganda. We had a great story from Uganda yesterday, but this one is not that good.

There are about 1.5 million internally displaced people in northern Uganda who are not refugees in other countries, but have nowhere to live due to the civil war that has been going on for almost 20 years.

And 20,000 children have been kidnapped as child soldiers, and the International Criminal Court is after five of their leaders – so what is it called?

I forgot the name of the army, but I think it was the Lord's Resistance Army, but the government is not a blank slate either, so I hope we can get the first video out.

(music) Woman: Camp life is never simple. Life is still difficult.

We stay here out of fear of what pushed us into the camp...

I still exist in my hometown.

Text: 'Between Two Fires: Torture and Displacement in Northern Uganda' Man: When we were at home, Kony's [rebel] soldiers were disturbing us.

At first we were safe inside the camp.

But then the government soldiers started to treat us badly.

(chanting) Jennifer: A soldier came out onto the road and asked where we were.

Evelyn and I hid behind my mother.

Evelyn: He ordered us to sit down, so we did.

Another soldier also came.

Jennifer: A man came and started taking my clothes off.

The other carried Evelyn aside.

The person who had defiled me then left me and went to rape Evelyn.

And then the guy who was raping Evelyn came along and defiled me too.

Man: Soldiers with clubs this long beat us to extract confessions.

They kept telling us, "Speak the truth!" like they beat us.

Woman: They claimed I was lying.

At that moment they opened fire and shot my finger off.

I fell. They ran to join the others... leaving me dead.

(music) Text: Uganda ratified the Convention Against Torture in 1986.

Torture is defined as the deliberate infliction of severe pain of physical or mental distress by an official in order to obtain information or a confession, or to punish, coerce, or intimidate.

Peter Gabriel: So torture doesn't always happen in other lands.

In my country, I saw pictures of British soldiers beating young Iraqis. There is Abu Ghraib. There is Guantanamo Bay.

I hired a driver on my way to Newark airport and he talked to me. I was taken out of my home in Queens at 4am in the middle of the night, taken to a location in the Midwest, interrogated and tortured, and returned to the streets four weeks later because of the same symptoms. He was Middle Eastern and had the same name as one of the 9/11 pilots. It may be true, but it may not. I didn't think he was an ant. But you know.

And if you look around the world, just like the polar ice sheets are melting, in some cases human rights that have been fought for hundreds of years are also eroding very rapidly. I think we need to look into that and maybe start working out for that.

So, again, one of our partners was with Van Jones on the Books Not Birds project—they managed to use film to change the juvenile correction system in place in California. I think a more—more—more humane way is being considered, how to confine young children, but that's a question in the first place.

We'll talk about Mr. Morales later, but I'm sorry, Mr. Gabriel.

No, no problem at all. Please take your time.

But this, indeed, whoever the man was, whatever he did, this is a cruel and extraordinary punishment.

Anyway, WITNESS has been trying to equip the brave people around the world who often risk their lives with cameras. I would like to show you a little more of that. thank you.

(Thunder) Text: You could call it a fabricated story.

(music) Text: You could say juries are corrupt.

You can say that people are lying.

I can say that I don't trust newspapers.

But I can't say that what I just saw never happened.

Help WITNESS bring cameras to the world.

Shoot a video. expose wrongdoing. reveal the truth. Tell me what's wrong with the world. And maybe we can help get it right.

witness.

All of the videos you just saw were recorded by human rights organizations working with WITNESS.

(Applause) PG: WITNESS was born out of technological innovation. In a way, the small, portable DV camera is what made it happen.

We have also tried to make computers world wide so that groups can communicate more effectively and campaign more effectively. But now camera phones offer great possibilities. Because it's cheap. it is everywhere. And it's going fast around the world -- and that's very exciting for us.

So the dream is to create a world where anyone who has had this kind of bad thing happen to them has a chance to have their story uploaded and watched and monitored and they really know their voice is heard and they have a huge website like Google Earth where they can fly there and know the reality of what is happening for the inhabitants of the world. In a way, what this technology makes possible is that many of the world's problems have human faces. For the first time, you can actually see who is dying of AIDS, who is being beaten, and hear their stories in a blogger culture kind of way. If we can bring that into this kind of field, I think we can really change the world in all sorts of ways.

Like a tree, it may rise from the ground, reach for the light, and create new movements that grow powerfully. thank you.

In this rather long kind of marathon presentation, I tried to divide it into three parts. The first part is full of examples of how working with computers can be a little more fun and how to really tackle the nature of human interfaces.

These are simple design qualities and, so to speak, the intelligent qualities of interaction.

The second part is really just an example of new technology. The new medium fits right into the mold.

Again, I will explain as soon as possible.

And the last example is a few that I've been able to gather and I think illustrate this in the entertainment world at least the best I can.

People have the idea that in the future they will use TV screens or their equivalents for e-books, and I share much of that. But then I think, 'Oh my God!

Well, it doesn't have to be terrible.

This is a slide shot from a TV, pre-processed for the TV medium, and it looks great.

Well what happened? How did people get caught up in this mess?

Are you suddenly sitting in front of your personal computer and video text (teletext system) and looking at what you see on the screen and feeling a little frightened?

Remember, TVs are designed to be viewed at eight times the diagonal distance.

So if you got a 13", 19", etc. TV, multiply that by 8 and that's how far you should sit from the TV.

Now put people 18 inches in front of the TV and suddenly all the artifacts none of the original designers expected to see stare into your face. Shadow masks, scanlines, everything.

And they are very easy to treat. There are ways to actually get rid of them, and there are ways to make really beautiful pictures.

Now let's talk a little bit about display technology.

Describes how to enter information.

My favorite example is always fingers.

I am very interested in touch sensitive displays.

High tech, high touch. Isn't that what some of you said?

Fingers are certainly a very important medium for input, and many think of them as a very low-resolution stylus for inputting into a display.

In fact, it doesn't. This is a very high resolution input medium. It only takes two actions, just touch the screen and then rotate your finger a little. And you can move the cursor very precisely.

So when I see these systems on the market with only a few light emitting diodes on the side and very low resolution, it's still better than nothing, so it's nice that they exist.

But that's kind of irrelevant. This means that the finger is a very high resolution input medium.

So what are the other benefits?

Well, one of the advantages is that you don't have to lift them, but people don't realize how important that is - not having to lift a finger to use them. (Laughter) If you think about the mouse a bit on the Macintosh -- I don't mean to criticize the mouse too much -- when you're typing -- what you have -- when you want to put something in -- you have to find the mouse first.

probably have to stop. It may take a long time to stop, but it has to find the mouse. Then find the mouse. I need to move the mouse around a bit to see where the cursor is on the screen.

And when you finally know where it is, you have to move it to get the cursor there and then 'bang' and press a button or do something.

This equates to four separate steps, and one and a half movements depending on how you count, compared to typing then touch to type and all in one movement.

Again, all I'm trying to do is describe the kinds of problems I think designers of new computer, entertainment, and educational systems face in terms of the quality of their interfaces.

And of course, another advantage of using fingers is that you have ten fingers.

And we had no idea how to technically do this. So this slide is a fake slide.

I've never had success with 10 fingers, but obviously there are things you can do with more than 1 finger input, and that's pretty tempting.

We stumbled across...

Again, as is typical in the computer world, if you have a bug that you can't get rid of, you turn it into a feature.

And maybe... (Laughter) Rats may be a new species of insect.

But the bug in our case was in the touch sensitive display. We wanted to be able to draw -- you know, by rubbing your finger across the screen to enter a series of dots -- but there was too much friction between your finger and the glass -- when the glass is the substrate (as it usually is).

So it turns out that it's actually a feature in the sense that you can build a pressure sensitive display.

And when you touch it with your finger, you can actually apply all the force to that screen surface, which actually has some value.

Let's load another disk for a quick example.

Now imagine a screen with not only a touch sensor but also a pressure sensor.

It is also sensitive to both forces in the plane of the screen, i.e. X, Y and Z forces in at least one direction. I didn't know how to go in another direction.

But let's take the slides off and see if this works.

OK. So the pressure sensitive display is working.

In other words, the person is just pressing the screen to draw a curve.

But here is the interesting part.

This movie is so badly made, please just stop.

And that display was made about 6 years ago, and a fairly large person sat on it as it was being moved from one room to another and it broke.

So all we have is this record. (Laughter) But imagine there's a bunch of objects on the screen and the person touches one of the N objects and presses it.

Now imagine a program with physically heavy objects and light objects. One is an anvil on a shaggy rug and the other is a ping-pong ball on a glass plate.

And when you touch, you have to press very hard to move the anvil on the screen, but if you touch the ping pong ball very lightly, the ping pong ball just scoots across the screen.

And what you can do, oops, I didn't mean to do that, but what you can actually do is give feedback to the user about how the physical properties feel.

Again, it doesn't have to be weight. They could be a general trying to move an army, and he has to move an aircraft carrier rather than a small boat.

In fact, they funded just that.

(Laughter) So the whole concept is that interfaces have physical properties on their transducers, in this case pressure and contact, that allow them to present things to the user that they could never have presented before.

So instead of just looking at the quality and luxury of interfaces, we're actually looking at the idea of ​​presenting something that hasn't been presented before.

I would like to move on to another example. This is one of another kind of example. They are currently trying to invent a new kind of book using computer and video disc technology.

The idea here is, if you do, pick up this book. Then the book will come to life.

You will breathe life into it.

We are so used to doing monologues.

For example, filmmakers are experts at creating monologues. When you make a movie, it has a proper beginning, middle, and end, and in a way that's art.

And you say, "I have a chance to make a conversational movie." Now what does that mean?

And it kind of nibbles at the heart of every premise of the whole profession and its media.

So writing a book is the same thing.

What I will show you in a moment is a new kind of book with all sorts of things mixed into it. But there are a few things to keep in mind.

One is that this book knows about itself.

Each frame of a movie has information about itself.

That is, the medium itself is known to contain computer-readable information. It's not a static movie frame.

it is one. Second, we need to realize that this is a random access medium and that in reality it can fork and grow and refine and shrink.

And here, once again, my favorite example is the cookbook "Larousse Gastronomique".

You'll use this example a lot, but it's a great example. Because little encyclopedia-esque cookbooks that explain how to do things like penguins have the classic ending, which says "cook until done" when you reach the end of the recipe.

Now, it's going to be the top green track, so to speak, but it doesn't mean much. But maybe I need to elaborate for myself or the non-expert and say, "Cook at 380 degrees for 45 minutes."

And if you're a true beginner, I'll dig deeper and give you more details. For example, "Open the oven, preheat it, wait for the lights to go out, open the door, don't leave it open too long, put the penguin in and close the door..." (laughs) Anything.

And it's much more elaborate than dribbling back.

This is a kind of usage of random access.

Another is if you want to describe the same thing in a different way.

If someone asks you a question in class, the last thing you do is repeat what you just said.

Consider saying the same thing differently, or if you know a particular student and their cognitive style, you might say it in a way that you think matches the impedance well with that student.

There are all sorts of techniques to use. Again, this is a different kind of branching.

So what I'm going to show you is... a pretty boring book, but I think sometimes sponsors have to read boring books because they're not necessarily into fiction or entertainment. And this is a book on how to fix a transmission.

Well, I don't even know what vintage the transmission is, but I'll give you a quick look at some of it and move on.

(Video) Narrator: Continue to get an explanation of each of these chapters.

Nicholas Negroponte: Well, here's his table of contents.

A photo of the transmission. Rubbing your finger over the transmission highlights different parts.

Narrator: When you find the chapter you want to see, just touch the text and the system will format the page for easy reading.

Words and phrases that are lit in red are glossary words, so just touch the word to see another definition overlaid on the illustration.

NN: This is about things like oil pans and oil filters.

This is relatively important as it sets up the page.

Narrator: Here's another example of a page with glossary words highlighted in red.

You can understand the meaning of the word just by touching it, and the meaning is displayed in the illustration corner.

Coming back to the illustration, in this case it's not a single frame, but a video of someone walking into that frame and making the repairs described in the text.

The double-headed slider is a speed control that allows you to watch movies forward or backward at different speeds.

And the video will be displayed as a full-frame video.

You can go back to the beginning and play the movie at full speed.

Only in this case, here is another step-by-step procedure. -- NN: Well, this movie is... we've all heard of sound-synchronized movies -- it's a text-synchronized movie, so the text is highlighted when the movie is played.

Highlight text while watching a movie.

Repairman: ...it's not that far. Front pole if possible.

Do not loosen too much. If it is too loose, it will be a problem.

NN: I suspect some of you may not even understand the language.

(laughter) Okay. In the third and final part of this article, I said I would try to give at least a few examples that could be directly related to the world of entertainment.

And, of course, good education requires good entertainment. So my first example is from a very recent experiment we've been doing, in this case Senegal, that tried to use personal computers as an educational medium. But never as an educational machine. The whole concept is to use this as a tool whose roles are completely reversed. So the child is the teacher and the machine is the student. The art of computer programming is a closer means of thinking about thinking.

However, teaching children to program does not make sense at all.

I only have a few slides to look at, but I have a story to tell. That was before we did this in any developing country, actually we are currently doing it in three developing countries, Pakistan, Colombia and Senegal, but when we did it in a pretty rough part of New York City.

And one child, whose name I forget, was about 7 or 8 years old, was considered completely mentally handicapped, could not read, could not be placed at the bottom of his class, was physically in school, but hardly attended school.

But I learned this particular language called Logos by hanging around the "computer room" where, according to citations, there were quite a few computers. And I found it very easy to learn and a lot of fun. It was very interesting. One day, by chance, a visitor from the NIE came to see this set-up in a double-breasted suit, and except for this one child, none of the children who were always there were there.

So he said, "Let me show you how this works" and they got a really original and wonderful description of Logo.

And the kid just rushed through the manual and showed them different things, but when they asked how to do something he couldn't explain, so he flipped through the manual, found the explanation and entered the command to do what they asked.

They were overjoyed, and when it came time to go see the principal, they weren't actually going to see him in the computer room, they went upstairs and said,

The child explained very clearly and showed us what the manual couldn't do automatically and dealt with it. It was really great. ”

The principal said, "It's a big mistake, because he can't read."

And you obviously cheated or were talking about someone else. ”

And everyone got up and went downstairs, and the child was still there. And they did something very clever. I asked the child, "Can you read?"

Then the child said, "No, I can't."

And they said, "But wait a minute. I just skimmed through the manual..." He said, "Oh, but I didn't read that."

So they said, "So what are you reading?"

He says, "Well, reading is like garbage they give me little books to read.

It's totally irrelevant (lol), you get nothing about it.

But here, a little effort pays off a lot. ”

And it was really meaningful for a child.

The child read brilliantly and turned out to be very capable indeed. So it actually meant something.

And there are many other similar anecdotes in this story, which is amazing. The key to the future of computers in education is right there, and what it means for children.

There are myths, but they are really myths. We believe that reading and writing is harder than learning how to speak, and many of you in this room believe that too.

No, we are thinking about speech. "Oh my God, little kids somehow pick it up and by the age of two they can do mundane tasks, and by the age of three or four they can speak quite well.

Still, you have to go to school to learn how to read, and you have to sit in a classroom and have someone teach you how to read.

So it must be harder. ’ Well, it’s not difficult.

The truth is that talking is of great value to children. A child can gain a lot from talking to you.

I can't read or write at all.

Children can read and write for no other reason than blind faith, and it will help you. (Laughter) And what happens is, you go to school and people say, "Believe me, you'll love it."

You will love reading, ”just read and read.

On the other hand, if you give a child (a 3-year-old) a computer, you can enter a little command and go "whoops!". --Something happens.

And suddenly... you might not call it literacy, but typing and reading on screen to some extent is very rewarding and a lot of fun.

And indeed, it is a powerful educational tool.

In Senegal, I found this to be the traditional classroom. There were 120 children, 3 per desk, 1 teacher, and a little chalk.

This student is one of our first students, the girl on the left leaning over holding the blackboard. She came...in two days--I want to show her the program she wrote and remember her hairstyle. And that's the program she made.

That's what it meant to her, to make a hair pattern, and she actually did it in less than two days, less than an hour each day. And it turned out to be the work that definitely meant the most to her...

But that was the bottom line, and little did she know how much knowledge she had acquired, not just in geometry, but in mathematics, logic, and everything else.

And again, I was able to talk on this subject for three hours.

Let's return to the last example and finish.

And my last example, I think some of my ex-colleagues who met in the room can imagine what it would be like.

Yes, it is. it's our job. That was a while ago and it's still my favorite project. It's a video conference.

And the reason this project remains one of my favorites is because I was asked to do a conference call system for the following situation. There were 5 people at 5 different sites and they were known people. And then I had to put these people on a conference call, each one fully convinced that the other four were physically present.

Well, that's funny enough, it's clear we jump for the bait, and we did.

And the fact that we knew people, we had to cut a page out of Walt Disney history, but we actually went so far as to make cathode ray tubes in the shape of people's faces.

So when I wanted to call my friend Peter Sprague, the secretary would stick his head out and put it on the desk [laughs], and that's the TV that would be used at the time.

And that's weird. I can't explain the amount of eye contact with a physical face projected onto that kind of 3D CRT.

The next thing we had to do was convince them that we needed a spatial response. This is easy, but again, this does not come naturally from telecommunications or computing thinking. It was a very architectural or spatial concept, so to speak.

It was recognizing that people's actual positions matter a lot when sitting around a table.

And really, when someone gets up to answer a phone call, go to the bathroom, etc., the empty seat becomes that person, so to speak. And you often point to the vacant seat and say, ``That person wouldn't agree,'' but the vacant seat is the person, and space matters.

So we said, 'These were to be placed on a round table, and the order around the table had to be the same, so that on my site I would be real, so to speak, and on each other's site we would have these plastic heads.'

The plastic head can sometimes be tempting to project.

There are many schemes, but I won't go into detail on this one, but this is the one we ended up using to project onto a face, literally a rear screen material molded into a person's face.

And then I'm going to show you another slide that's actually made out of something called stereophotography, and it's a screen.

Now, we track head movements on a person's head, send the head position on video, and this head moves in about two axes.

So if I suddenly turned to the person on my left and spoke to him, on the site of the person to my right I would see these two plastic heads talking to each other.

And when that person interrupts, those two heads can spin.

And it's actually, quite accurately, reconstructing video conferencing.

Alec Soth: So, about ten years ago, I got a call from a woman named Stacey Baker from Texas. She had seen some of my photos at art exhibitions and was wondering if I could ask her to take a portrait of my parents.

Now, since I had never met Stacey at the time, I thought this was some kind of rich oil tycoon and I got a lot of money, but it was only later that I learned that she actually took out a loan to make this happen.

I took pictures of her parents, but I was actually more excited to photograph Stacey.

The photo I took that day ended up being one of my most famous portraits.

Stacey was working as an attorney in Texas when I took this photo.

Not long after, she quit her job to study photography in Maine. During my stay, I met the photography director of The New York Times Magazine and was actually offered a job.

Stacey Baker: Over the years, Alec and I worked together on many magazine projects and became friends.

A few months ago I started talking to Alec about my attraction.

I was always obsessed with how couples meet.

When I asked Alec how he met his wife, Rachel, he told me about when she was 16 and I was 15 at a high school football game and he asked her out on a date.

He liked her purple hair.

She said yes and that was it.

I then asked Alec if he would be interested in a photographic project exploring this question.

AS: I was interested in that question, but I was actually more interested in what motivated Stacy to ask it, especially since I didn't know she had a boyfriend.

So I thought it would be interesting if she met someone as part of this project.

So my idea was to have Stacey go speed dating in Las Vegas for Valentine's Day.

(laughter) (applause) (music) SB: We ended up attending what was billed as the world's largest speed dating event.

There were 19 dates, each lasting 3 minutes.

Participants were given a list of ice-breaking questions to guide the story, such as, "If you could be any kind of animal, what would you like to be?"

Such that.

My first date was Colin.

He is from England and once married a woman he met after posting a Capricorn ad.

Alec and I met him at the end of the night and he said he kissed a woman in line at one of the stalls.

Zack and Chris came to Date A Song together.

Carl.

I asked Karl, "What is the first thing you notice about women?"

He said "Boobs".

(Laughter) Matthew is attracted to women with muscular calves.

we talked about running. He does triathlons and I run half marathons.

Alec actually liked his eyes and asked if I was attracted to him but I wasn't and I don't think he was attracted to me either.

Austin and Mike got together.

Mike asked me a hypothetical question.

He said, "You're on the elevator and you're going to be late for a meeting.

Someone dashes for the elevator.

open for them? ”

And I said no.

(Laughter) Cliff said the first thing you notice about a woman is her teeth, and we complimented each other on our teeth.

He says he needs to floss more to prevent gum disease because he sleeps with his mouth open, so I asked him how often he flosses and he said "every other day."

(Laughter) Now, as someone who flosses twice a day, I wasn't really sure if it was flossing more, but I don't think I said it out loud.

Bill is an auditor, and we talked about auditing for the whole three minutes. (Laughter) The first thing Spencer notices about a woman is her complexion.

He feels that many women wear too much makeup and should only wear enough makeup to accentuate their features.

He thought it was a good thing when I told him I was wearing no makeup at all.

Craig told me he wasn't going to take a weak spot.

He was also frustrated when I couldn't remember my most embarrassing moments.

He thought I was lying, but I wasn't.

I thought he didn't like me at all, but at the end of the night he came back to me and gave me a box of chocolates.

William was really difficult to talk to.

i think he was drunk

(Laughter) Actor Chris McKenna hosted the event.

He used to be in 'The Young and the Restless'.

I didn't actually go on a date with him.

Alec said he saw several women giving him their phone numbers.

Needless to say, I didn't fall in love.

I didn't feel a special connection to any of the men I dated, nor did they feel a special connection to me.

AS: Well, the most beautiful thing for me as a photographer is (laughter) vulnerability.

There is a crack in the physical exterior that gives a glimpse of the more fragile interior.

I saw many examples of that at this Date-A-Son event, but as I watched Stacey's date and talked about it, I realized how different love in pictures is from real life.

what is true love? How does it work?

To tackle this question and understand the journey from dating to living together, Stacey and I traveled to Sun City Summerlin, the largest retirement community in Las Vegas.

My contact there was George, who runs the community photography club.

He arranged for us to meet another couple at a makeshift photo studio.

SB: After 45 years of marriage, Anastasia's husband died two years ago. So we asked her if she had old wedding photos.

She met her husband when she was 15 and was a waitress at a small barbecue place in Michigan.

he was 30 years old.

She lied about her age.

He was the first person she dated.

Dean has been named Las Vegas Photographer of the Year two years in a row, and the fact that Dean met his wife Judy at the same age Alec met Rachel caught Alec's attention as well.

Dean admitted that he liked looking at beautiful women, but he never questioned his decision to marry Judy.

AS: George met Josephine at the parish dance.

He was 18 and she was 15.

Like many couples we met, they weren't particularly philosophical about their early choices.

What George said really stuck in my mind.

He said, "When you feel that emotion, just follow it."

Bob and Trudy met on a blind date when she was still in high school.

The two said they weren't particularly attracted to each other when they first met.

Nevertheless, they got married soon after.

SB: The most memorable story for me is that of photography club president George and his wife Mary.

This was the second marriage for George and Mary.

They met at a country-western club called The Sahara in Louisville, Kentucky.

He was drinking alone there and she was with her friends.

When they started dating, he owed the IRS $9,000 in taxes and she offered to help forgive his debt, so the next year he gave his salary to Mary and she had his debt forgiven.

At the time of their marriage, George was actually an alcoholic, but Mary knew it.

At one point in their marriage, they drank 54 beers a day.

On another occasion, he threatened to kill Mary and her two children while drunk, but the children fled and a SWAT team was called to the house.

Amazingly, Mary brought him back and things eventually turned around.

George is a member of Alcoholics Anonymous and has been sober for 36 years.

(music) After all, after we left Sun City, I told Alec that I didn't find this couple's story of how they met all that interesting.

Even more interesting was how they were able to stay together.

AS: They all had this beautiful attribute of perseverance, and it applied to singles as well.

The world was harsh, singles were trying to connect with other people, and couples were clinging to each other decades later.

My favorite photo from this trip is Joe and Roseanne.

Well, by the time we met Joe and Roseanne, we had gotten into the habit of asking couples if they had old wedding photos.

In their case, they pulled out the exact same photo from their wallet at the same time.

I wondered, which is more beautiful, this image of a young couple just falling in love, or the image of a couple holding onto this image for decades?

thank you.

(applause)

People are more afraid of insects than they are of dying.

(Laughter) At least according to the 1973 "Book of Lists" survey that preceded all the best, worst and funniest lists you'll see online today.

Height and public speaking were the only sources of fear beyond six legs.

Had I put spiders in there, I suspect the combination of insects and spiders would have topped the charts.

Well, I'm not one of those people.

I really love insects.

I find them funny, beautiful, and sometimes cute.

(Laughter.) And I'm not alone.

Over the centuries, Charles Darwin to Dr. E.O. Wilson drew inspiration from studying the tiniest minds on earth.

So why?

What keeps us coming back to talking about insects?

Part of it, of course, is just the sheer magnitude of just about everything about them.

They are more numerous than any other kind of animal.

New insects are being discovered all the time, so we don't even know how many there are.

At least 1 million, maybe 10 million.

This means you can create a calendar of insects for the month and not have to reuse seeds for over 80,000 years.

(Laughs) Pandas and kittens, take it!

(Laughter) More seriously, insects are essential.

we need them.

It is estimated that one in three mouthfuls of food is made possible by pollinators.

Scientists use insects to make fundamental discoveries about everything from the structure of the nervous system to how genes and DNA work.

But what I love most about insects is that they teach us about our own behavior.

Insects seem to do everything that humans do.

Meet, mate, quarrel, and part.

And they do so with feelings that look like love or animosity.

But what drives their behavior is actually different than what drives our own behavior, and the difference can be very enlightening.

Nowhere is the truth more true when it comes to one of our most consuming interests: sex.

Now let's do the maintenance. And as surprising a statement as it may seem, I think I can defend it.

I think insect sex is more interesting than human sex.

(Laughter.) And the wild breed we see makes us question our own assumptions about what it means to be male and female.

Of course, many insects don't need intercourse at all to reproduce in the first place.

Female aphids can make tiny little clones of themselves without mating.

The virgin birth is right there.

on your rosebush.

(Laughter) When they have sex, their sperm is more interesting than human sperm.

Some species of fruit flies have sperm that are longer than the male's own body.

This is important because males use sperm to compete.

Now, insect males compete with the horn-like weapons of these beetles.

However, they still compete with sperm after mating.

A dragonfly or damselfly penis looks like a swiss army knife with all its appendages pulled out.

(Laughter.) They use horrible devices like shovels to remove sperm from previous males that females have mated with.

(Laughter.) So what can we learn from this?

(Laughter) Okay. This is not a lesson in the sense that we imitate them or that they set an example for us to follow.

Given this, it probably does as well.

Also, did we mention that sexual cannibalism is rampant among insects?

No, it doesn't matter.

But I think what insects are doing is breaking many of the rules we humans have about sexual roles.

So people have this idea that nature dictates a sort of 1950s sitcom version of how men and women should be.

As such, it is believed that men should always be dominant and aggressive while women are passive and shy.

But it's not.

For example, consider the katydid, a relative of crickets and grasshoppers.

Not only do males transfer sperm during mating, but they also give females something called wedding gifts, so they are very picky about their mates.

In these pictures you can see two katydids mating.

In both panels, the male is on the right, and the sword-like appendage is the female's ovipositor.

The white mass is the sperm and the green mass is the matrimonial gift that the male produces from his body, which is very expensive to produce.

Its weight can reach a third of its body weight.

Let's pause for a moment and consider what would happen if a human male had to produce 50, 60, 70 pounds of weight each time he had sex.

(Laughter) Well, they won't be able to do that often.

(Laughter.) And indeed, so are the grasshoppers.

What this means is that male katydids are very careful about who they give wedding gifts to.

Now this gift is so nutritious that females eat it during and after mating.

In other words, the bigger the body, the better off the male, because it means that the male's sperm has more time to flow into the female's body and fertilize the egg.

But it also means that males are very reluctant to mate, whereas females are very aggressive and competitive trying to get as many of these nutritious marriage gifts as possible.

So this is not strictly a typical set of rules.

But more generally, in the lives of many insects, males are not really that important.

The social insects—bees, wasps, ants, the individuals you see every day, the ants that scurry back and forth in your sugar bowl, the bees that fly from flower to flower—all are always female.

For thousands of years, people have struggled to understand the idea.

The ancient Greeks knew that there was a kind of honeybee, the drone, which was larger than the worker bee, but opposed drone laziness, as drones only hovered around the hive until their mating flight.

They prowl until mating flights, but do not participate in nectar or pollen gathering.

Part of the confusion was that the Greeks were unable to determine the gender of the drones, and although they knew of the stinging ability of bees, it was hard to believe that such a weapon-bearing animal could be female.

Aristotle also tried to get involved.

He suggested, "Okay, if the stinger turns into a male..."

Then he got confused. It meant that the males would also take care of the young within the colony, which they seemed to think was completely impossible.

He concluded that honeybees probably have organs of both sexes in the same individual. It's not that outlandish, and some animals do, but I couldn't really figure it out.

And as you know, my students still refer to all animals they see as males, including insects.

And when I tell them that the giant-jawed, ferocious military ant soldiers used to defend their colonies are always female, they don't seem to quite believe me.

(Laughter.) And yes, all the movies – Antz and Bee Movie – show social insect protagonists as male.

So what difference does this make?

These are movies. they are fiction.

There are talking animals inside.

What difference does it make when they speak like Jerry Seinfeld?

I think it's certainly important, and I think it's actually part of a deeper issue that affects medicine and health and many other aspects of our lives.

We all know that scientists use something called a model system. It is a stand-in animal for all other animals, including humans (white rats and fruit flies).

And the idea that what is true for humans is also true for albino mice.

And by and large it turned out to be the case.

However, you may be taking the model system idea too far.

And I think what we've done is use the males as if they were a model system in any species.

Standard.

This is how things should be.

And women are a kind of variation, a special one that can only be studied after understanding the basics.

So back to insects.

I think what that meant was that people couldn't see what was in front of them.

Because they believed that the world stage was dominated by male players, with women playing minor roles.

But in doing so, we really miss what nature is like.

It is also possible to miss how living creatures in nature, including humans, change.

I think that's why we've used men as models in a lot of our medical research, but it's been found to be problematic if we want to apply the results to both men and women.

Now, what I really like about insects is that many people have concerns about them.

They have tiny little brains with very few cognitive abilities that we normally think of.

They have complex behaviors, but they don't have complex brains.

So just because they don't do things the way we do, we can't treat them like little people.

I love anthropomorphizing insects and how difficult it is to look at an insect and think of it as a six-legged exoskeleton dwarf.

(Laughter) Rather, bugs make us question what is normal and what is natural, so we have to take them on their own terms.

Well, people write novels and talk about parallel worlds.

They speculate about the supernatural, perhaps the spirits of the deceased walking among us.

Otherworldly fascination is said to be part of the reason people want to dabble in the paranormal.

But as far as I'm concerned, who needs to be able to see dead people when they can see live insects?

thank you.

(applause)

In the early days of Twitter, it was kind of a place of radical disgrace.

People will confess embarrassing secrets about themselves and others will say, "Oh my God, I'm exactly the same."

The voiceless found that they had a voice, and it was powerful and eloquent.

When a newspaper ran a racist or homophobic column, we thought we could do something about it.

i was able to get them.

We could hit them with weapons that we understand, but they didn't, which is social media disgrace.

Advertisers will take down their ads.

We intended to get them when those in power abused that privilege.

This was like the democratization of justice.

Hierarchies were being leveled.

We were going to make things better.

Shortly after, a disgraced pop-science writer named Jonah Lehrer called — he told me he was in shame and regret after being caught plagiarizing and fabricating quotes.

And he took the opportunity to publicly apologize at a Foundation luncheon.

This would be the most important speech of his life.

Perhaps it will bring him some salvation.

He knew before his arrival that the Foundation was going to livestream his event, but what he didn't know until he actually arrived was that they had set up a giant screen Twitter feed right next to his head.

(Laughs) Another person on the monitor screen in front of him.

I don't think they did this because the Foundation is a monster.

I think they were ignorant. I think this was a unique moment when the beauty and naivety of Twitter met with an increasingly terrifying reality.

And here are some of the tweets that streamed into his gaze where he was about to apologize: "Jonah Lehrer bore us to forgive him."

(Laughter) And, "Jonah Lehrer hasn't proven that he can feel shame."

This must have been written by the greatest psychiatrist of all time, to know such a small person behind the podium.

And "Jonah Lehrer is just a terrible sociopath."

The last word is a very human act that dehumanizes the people we hurt.

Because I want to destroy people, but I don't feel bad about it.

Imagine if this was a real courtroom, with the defendant begging for another chance in the dark and the jury yelling, "Boring! You misfit!"

(Laughter.) In courtroom dramas, we tend to sympathize with kind-hearted lawyers, but when we give ourselves power, we become like judges on a hang.

Power changes rapidly.

We were trying to catch Jonah because he was seen as abusing his privilege, and Jonah was on the floor at the time, and we were still kicking and praising ourselves for hitting.

And it started to feel strange and empty without those in power who abused the privileges we get.

A day of no shame began to feel like a day of treadmilling.

let me talk

It's about a woman named Justine Sacco.

She's a PR woman from New York with 170 followers on Twitter who tweeted this bit of a bit of a bit of a joke on the plane from New York to London. It's 2014 now. Buy some deodorant. ”

- Inner monologue while smoking BO. Thank God for medicines. ] So Justine chuckled to herself and pressed send, but got no reply. And I felt the sadness we all feel when the internet doesn't celebrate us as funny.

(Laughter) The black silence when the internet says nothing.

Then she arrived at Heathrow and with some time left before the final leg, she came up with another funny and biting joke. [Going to Africa]. I hope you don't get AIDS. just kidding. I'm white!] And she chuckled to herself, hit send, got on the plane, got no answer, turned off her phone, fell asleep, woke up 11 hours later, turned on her phone while the plane was taxiing down the runway. Soon after, I received a message from someone I hadn't spoken to since high school saying, "I'm so sorry for what's happened to you."

And another message from my best friend, "Call me now.

You are the world's #1 trending topic on Twitter. ”

(Laughter) What happened was that one of her 170 followers sent that tweet to the Gawker journalist, and that tweet was retweeted to her 15,000 followers. [And now a funny holiday joke from the IAC's head of public relations] And it was like lightning.

A few weeks later, I spoke with a Gawker journalist.

When I asked him how he felt by email, he said, "It was delicious."

And he said, "But I'm sure she'll be fine."

But she wasn't okay. Because while she was sleeping, Twitter took over her life and slowly dismantled it.

First there were the philanthropists: [If @JustineSacco's unfortunate words bother you... If you don't mind, please join me in supporting @CARE's work in Africa. ] […in view of the offensive and racist tweets, I'm donating to @care today] Then came the other side of the horror: [...there are no words for such an offensive racist as Justine Sacco's fucking tweet.

It's beyond scary. ] Was anyone on Twitter that night? Some of you.

Did Justin's jokes dominate your Twitter feed the same way mine did?

That was me too, but I thought what everyone thought that night, it was "Wow, someone messed up!"

Someone's life is getting terrible! ”

And I got up in bed, put a pillow behind my head, and wondered if the joke was meant to be racist.

Perhaps she was ridiculing the gleeful display of privilege rather than the gleefully flaunting of her privilege.

Comedy traditions like South Park and Colbert and Randy Newman.

Perhaps Justin Sacco's guilt is that he wasn't as good as Randy Newman.

In fact, when I met Justin at a bar a few weeks later, she was just so devastated that when I asked her to explain the joke, she said, "Living in America, I'm kind of in a bubble when it comes to what's going on in the third world.

I was making fun of that bubble. ”

You know, another woman who posted on Twitter that night, New Statesman writer Helen Lewis, reviewed my book on public shaming and wrote that night she tweeted, "I don't know if her jokes were meant to be racist," and immediately said she was furious at the tweet, "Well you're just a privileged woman too."

And embarrassed, she wrote, she silently watched Justine's life be torn apart.

It started to get dark: [everyone go report this motherfucker @JustineSacco] and there were calls for her to be fired.

[Good luck with your job hunting in the new year. #GettingFired] Thousands of people around the world decided it was their duty to fire her.

[@JustineSacco Last tweet of your career. #SorryNotSorry Justin's disappearance involved companies trying to sell their products: [Next time you're going to tweet something stupid before you take off, get on the @Gogo flight!] (laughter) Many companies made a lot of money that night.

As you know, Justin's name is typically searched on Google 40 times a month.

That month, between December 20th and the end of December, her name was googled 1,220,000 times.

And one internet economist told me that Google would have made between $120,000 and $468,000 from Justin's elimination, while we, who were really embarrassed, got nothing.

(Laughter.) We were kind of unpaid, shameful interns at Google.

(laughter) And then came the trolls: [Actually I hope Justin Sacco gets aid? (Laughter) Someone else in this article wrote, "Someone with HIV should rape this bitch, and we'll see if her skin color protects her from AIDS."

And that person got a free pass.

No one chased him.

We were all so excited about destroying Justine, and our shameful brains are so simple that we couldn't even handle destroying someone who inappropriately destroys Justine.

That night, Justin was actually uniting groups ranging from philanthropists to "rape bitch" groups.

[@JustineSacco I hope you get fired! You crazy bitch...

Let the world know you plan to ride a horse naked while in Africa. ] Women are always in a worse situation than men.

When a man is embarrassed, it means "I'm going to fire you."

When a woman is humiliated, it is "fired, raped, and cut out of the womb."

And Justin's employer also got involved. [IAC @JustineSacco Tweet: This is a ridiculously offensive comment.

The employee in question is currently unavailable on international flights. ] And then anger turned to excitement. [All I want for Christmas is to see @JustineSacco's face as the plane lands and checks his inbox/voicemail. #fired] [Oh, @justinesacco is going to have the most painful phone turn-on moment ever when the plane lands. ] [We're about to see this @JustineSacco bitch get fired. in real time.

before she knew she was going to be fired. ] What we went through was a fun story arc.

We knew something Justin didn't know.

Can you think of anything less judicial than this?

Justine was asleep on the plane and unable to explain herself, and her incompetence was a big part of the fun.

On Twitter that night, we were like toddlers crawling to guns.

Someone pinpointed which plane she was on and linked it to a flight tracking website.

[British Airways flight 43 on time - arrived in 1 hour 34 minutes] A hashtag has started trending around the world: #hasJustineLandedYet?

[It's kind of wild to see someone unknowingly self-destruct. #hasJustineLandedYet] [Seriously. I'm just going home to sleep, but everyone at the bar is obsessed with #HasJustineLandedYet. I can't take my eyes off you. can't get out ] [#HasJustineLandedYet might be the best thing to happen on my Friday night. ] [Isn't anyone in Cape Town going to the airport to tweet her arrival?

Come on Twitter! I want a picture] What will happen then? Yeah there was

[@JustineSacco actually landed at Cape Town International Airport.

And if you want to know what it's like to be torn to pieces by good people like us, not trolls, because of a misunderstood liberal joke, here it is: [...she decided to wear sunny pants as a disguise. ] So why did we do that?

I think some people were genuinely angry, but for others I think it's because Twitter is basically a mutual approval machine.

It feels great because we are surrounded by people who feel the same way we do and we recognize each other.

And if someone gets in your way, get rid of them.

And do you know what it's against?

It is the antithesis of democracy.

We wanted to show that we care about people dying of AIDS in Africa.

Our desire to be thought of as compassionate has driven us to this extremely uncompassionate act.

As Megan Ogeeblin wrote in The Boston Review, "This is not social justice. It's an alternative to catharsis."

For the past three years, I have traveled the world to meet people like Justin Sacco. Believe me, there are many people like Justin Sacco.

There are more every day.

And we'd like to think they're okay, but they're not okay.

People I met were messed up.

They told me about depression, anxiety, insomnia, and suicidal thoughts.

A woman I spoke to, who made an off-topic joke, also stayed home for a year and a half.

Prior to that, she had worked with adults with learning disabilities and seemed to do a very good job.

Of course, Justin was fired because social media demanded it.

But it was worse than that.

she lost herself.

She woke up in the middle of the night forgetting who she was.

She was arrested because she was deemed to have abused her privilege.

And, of course, this is bringing people together for a much better purpose than it used to be, such as having children out of wedlock.

But the term “privilege abuse” is becoming a free pass to rip off just about anyone we choose.

It's becoming a low-value language that robs us of our ability to empathize and distinguish between serious and less serious violations.

Justin had 170 Twitter followers, so I had to fictionalize her to make it work.

Rumors circulated that she was the daughter of mining billionaire Desmond Sacco.

[Don't let #JustineSacco fool you. Her father is a South African mining billionaire.

she's sorry Neither does her father. ] I thought that was true about Justin until I met her at a bar and asked her about her millionaire father, and she said, "My father sells carpets."

And it reminds me of the early days of Twitter. Back then, people were admitting embarrassing secrets about themselves and others were saying, "Oh my god, I'm exactly the same."

These days, people's shameful secret quests are going on.

You can live a good and ethical life, but bad language in your tweets can overwhelm everything and be a clue to your secret inner evil.

There are probably two types of people in the world. People who prefer humans to ideologies, and people who prefer ideologies to humans.

I favor humans over ideology, but right now the ideologues are triumphant, creating the arena for a constant artificial lofty drama in which everyone becomes either great heroes or disgusting villains. Even though I know it's not true about us fellow humans.

The truth is we are smart and stupid. The truth is that we are in a gray area.

The great thing about social media was that it gave voice to the voiceless, but now that we're building a surveillance society, the smartest way to survive is to go back to the voiceless.

Don't do that.

thank you.

(Applause) Bruno Giussani: Thank you, John.

Jon Ronson: Thank you Bruno.

BG: Please don't go.

What strikes me about Justin's story is the fact that if you Google her name today, this story will occupy the first 100 pages of Google search results. Nothing else is written about her.

In your book, you mention the story of another actual victim who was duped by a reputation management company, who managed to get it on the first few pages of Google's search results by creating a blog and posting sweet, harmless stories about cat love, holidays, and more, but it didn't last long.

After a few weeks, they gradually began to return to top results.

Is this a completely lost battle?

Jon Ronson: You know, when we see some kind of unfair or vague shaming, I think the best thing we can do is speak up. Because I think the worst thing that happened to Justin was that nobody stood up for her. That is, everyone was against her. And it's very traumatic to have tens of thousands of people tell you, "you get out."

But, like in a democracy, when something shameful happens and people are arguing about it, I think it does a lot less damage.

I think that's the way forward, but it's difficult. Because if you stand up for someone, it's incredibly offensive.

BG: Now let's talk about your experience. You stood up by writing this book.

By the way, is this a must-read for everyone?

You stand up because this book puts the spotlight on those who really know shame.

And I think it wasn't just the friendly reaction on Twitter.

JR: It wasn't very good for some people.

(Laughter) So you can't just focus. Because many people understood this book and were very kind to me.

But yeah, I've been writing stories about abuse of power for 30 years. Everyone applauds me when I talk about the military and pharmaceutical powers.

As soon as you say, "We are power abusers," they say, "You must be a racist, too."

BG: So the other night, yesterday, we were having dinner and there were two discussions going on.

On the one hand, you were sitting around a table talking to people, and it was a wonderfully constructive discussion.

On the other hand, every time you access your mobile phone, you are flooded with insults.

JR: Right. This happened last night. We had something like a TED dinner last night.

We were chatting and it was so nice and lovely that we decided to check out their Twitter.

Someone said, "You're a white supremacist."

Then I went back and had a nice conversation with someone, and then I went back to Twitter and someone said my very existence made the world worse.

My friend Adam Curtis says that maybe the internet is like a John Carpenter movie from the 1980s, and eventually everyone will start yelling at each other and shooting at each other, eventually everyone will flee to a safer place, and I'm starting to think that's a really great option.

BG: Thank you, John. JR: Thank you Bruno.

(applause)

It was my brain tumor that brought me back here.

Isn't it lovely?

(Laughs) The key word is "was".

(Applause.) As you can imagine, having a brain tumor was really devastating news to me.

I knew nothing about cancer.

In Western culture, when you get cancer, it sort of disappears.

Your complex human life is replaced by medical data such as images, tests, lab values, and medication lists.

And we all change.

I suddenly got sick in my leg.

Doctors start speaking a language you don't understand.

They start pointing fingers at your body and images.

People will also start to change because they will be dealing with disease instead of people.

They said, "What did the doctor say?"

before saying "Hello".

And in the meantime, questions remain that no one gives answers to.

These are "Can you do it?" Question: Can I work while I have cancer?

can i study? Can I fall in love with you? Can you be creative?

And you ask, "What did I do that caused this?"

I'm thinking, "Can I change something in my lifestyle?"

You may be wondering, “What can I do?”

Do you have other options? ”

And, unsurprisingly, doctors are the good guys in all these situations because they are highly professional and dedicated to curing their patients.

But they are also so accustomed to having to deal with patients that I think this is torture for them and sometimes they lose the idea that they are literally patients. "Patient" means "one who waits".

(Laughter) Things are changing, but classically, I tend not to get involved at all in learning about my condition, getting my friends and family involved, and showing them how to change their lifestyles to minimize the risk of what they're going through.

But instead you are forced to wait there, in the hands of a series of highly professional strangers.

While in the hospital, I had a photo of my cancer printed out and talked to it.

It's not common to ask for a picture of your own cancer, so it was very difficult to get one.

I spoke to it and said, "Okay, Mr. Gunn, you're not everything to me.

I have more than that.

Whatever therapy it is, I have to deal with the whole me. ”

And the next day I left the hospital against my doctor's advice.

I was determined to change my relationship with cancer and learn more about it before doing something as drastic as surgery.

I am an artist and use some form of open source technology and open information in my practice.

So my best bet was to put everything out there, make the information public, and use it for everyone to access.

So I created a website called La Cura and put my medical data there.

I actually had to hack it, but I can talk about that in another speech.

(laughter) I chose the word 'La Cura'. La Cura means "cure" in Italian. Because in many different cultures the word "cure" has different meanings.

In our Western culture, it means eradicating or curing disease, but in different cultures, such as Asian, Mediterranean, Latin and African cultures, it means much more.

Of course, I was interested in the opinions of doctors and health care providers, but I was also interested in the treatments of artists, poets, designers, and musicians.

I was interested in social therapy, I was interested in psychological therapy, I was interested in psychic therapy, I was interested in emotional therapy, I was interested in all forms of therapy.

And it worked.

La Cura's website went viral.

I received a lot of media attention from Italy and abroad and soon received over 500,000 contacts via email, social networking, etc. Most of them were suggestions on how to cure my cancer, but more were about how to cure myself as a complete individual.

For example, thousands of videos, images, photographs and art performances have been produced for La Cura.

For example, take a look at Francesca Fini's performance here.

Or, as artist Patrick Lichty did, he made a 3D sculpture of my tumor and sold it on Thingiverse.

Now you can be my cancer too!

(Laughter) That's good, come to think of it, we can share cancer.

And this was happening - scientists, experts in traditional medicine, several researchers, doctors - all contacted me and gave me advice.

With all this information and support, I was able to assemble a team of several neurosurgeons, traditional physicians, oncologists, and hundreds of volunteers to discuss the information received. This is very important.

And together we were able to develop our own treatment strategies according to different cultures and in different languages.

And the current strategy, which spans the entire world and thousands of years of human history, is very remarkable to me.

[Surgery] A follow-up MRI fortunately showed little or no cancer growth.

So I was able to take my time and choose.

I chose the doctor I wanted to work with and the hospital I wanted to be admitted to. Thousands of people supported me during that time, but no one sympathized with me.

Everyone felt like they could play a positive role in helping me get better. This was the most important part of La Cura.

What are the results?

As you can see, I'm fine, pretty fine.

(Applause.) After the surgery, we had some great news. I had a very low grade glioma. This is the "good" kind of cancer that doesn't grow much.

I completely changed my life and lifestyle.

Everything I did was thought out to keep me occupied.

A matrix of electrodes was implanted into the brain from this side so that a functional map of what the brain could control could be built up until the last minutes of the very intense surgery.

And just before surgery, I was able to discuss with my doctor a functional map of my brain so that I could understand what risks I was facing and what risks I wanted to avoid.

Obviously there was.

[Openness] And this openness was really a fundamental part of La Cura.

Thousands of people shared their stories and experiences.

Doctors were able to talk to people they wouldn't normally talk to when thinking about cancer.

I am in a state where science meets emotion, conventional research meets traditional research, self-establishing and continuously translating between many different languages.

[Society] The most important thing about La Cura is to feel truly participatory and part of a connected society, the health of which actually depends on the health of all its constituents.

This worldwide performance is my open source cure for cancer.

My feeling is that this is therapy, not just for me, but for all of us.

thank you.

(applause).

When I painted the minaret of the Hala Mosque in my hometown of Gabes in southern Tunisia in 2012, I had no idea that graffiti would bring so much attention to the city.

At first I was looking for a wall locally, and it happened that a minaret was built in 1994.

And for 18 years, that 57-meter concrete remained gray.

When I first met the imam, when I told him what I wanted to do, he said, "I'm glad you finally came" and that he'd been waiting for years for someone to do something.

The most amazing thing about this imam is that he didn't ask me anything. I didn't ask for a sketch or what I was going to write.

In every piece I create, I write messages in my style of calligraphy and graffiti, which is a combination of calligraphy and graffiti.

Use quotes and poems.

For the minaret, I thought that the most appropriate message for the mosque should come from the Qur'an, so I chose the following verses: "Humanity, we created you from male and female, we made you a people and a tribe, so that you can know each other."

It was a universal call for peace, tolerance and acceptance, emanating from aspects we don't usually portray in the media in a positive way.

I was amazed to see how the locals reacted to this painting. I also got to see how proud they are to see the Minaret getting so much attention from the international press all over the world.

For the Imam, it was more than just a painting. It was really deeper than that.

He hoped the minaret would become a city monument and draw people to Tunisia's forgotten parts.

The universality of the message, the political context of Tunisia at the time, and the fact that I was writing the Qur'an like scribbling were not the point.

It reunited the community.

My job is to connect people, future generations, through Arabic calligraphy.

Writing messages is the essence of my work.

The funny thing is that even Arabic speaking people have to be very focused to decipher what I'm writing.

You don't have to know the meaning to feel the work.

I believe that Arabic letters touch the heart before they reach the eyes.

There is beauty that does not need to be translated.

I believe that Arabic letters are understood by everyone. To you, to you, to everyone, and when you understand what it means, you feel connected to it.

I always try to write messages that are relevant to the places I'm painting, but that have a universal dimension that everyone in the world can relate to.

Born and raised in Paris, France, I started learning to read and write Arabic at the age of 18.

Today I will write messages only in Arabic.

One of the reasons this is so important to me is because of all the reactions I've experienced around the world.

In Rio de Janeiro, he translated this Portuguese poem by Gabriela Torres Barbosa, which paid homage to the poor of the favela, and painted it on the rooftop.

The locals were very interested in what I was doing, and as soon as I told them the meaning of calligraphy, they empathized and appreciated my work.

In Cape Town, South Africa, the local community of Philippi provided me with the only concrete wall in the slums.

It was a school, so I wrote the words of Nelson Mandela there. The word "[in Arabic]" means "seems impossible until it is done".

Then the man came to me and said, "Hey, why don't you write in English?"

And I told him, "If you ask me why I didn't write in Zulu, I think your concerns are justified."

There was an event like this in Paris once, and someone had their walls painted.

And when he saw me painting in Arabic, he got very angry and actually got hysterical and asked me to remove the wall.

I was annoyed and disappointed.

However, a week later, the organizer of the event said, "Please come again," and said, "There is a wall in front of this person's house."

I mean, this guy [laughs] was forced to watch it every day.

At first I was going to write '[in Arabic]' which means 'to your face', but (laughter) I decided to be smarter and wrote '[in Arabic]' which means 'open your heart'.

I am really proud of my culture and try to be an ambassador for it through my artwork.

And I hope that the beauty of the Arabic script will break the stereotypes we know.

I no longer write translations of messages on the wall.

Just like you can enjoy music from other countries, I don't want you to destroy calligraphy poetry because it's an art that you can appreciate without knowing the meaning.

Some see it as a rejection or a closed door, but for me it is more an invitation to my language, my culture and my art.

thank you.

(applause)

This is a map of New York State produced in 1937 by the General Drafting Company.

This is a very famous map among cartography enthusiasts. Because here at the foot of the Catskill Mountains, there's a little town called Roscoe. In fact, it would be easier to put it here. There is Roscoe, and just above Roscoe is Rockland, New York, and just above that is the small town of Aglow, New York.

Aglow, New York is very famous for cartographers because it is a paper town.

This is also called the copyright trap.

Cartographers often insert fake locations on maps to protect copyright because my map of New York and your map of New York are very similar due to the shape of New York.

Because if my fake location shows up on your map, I can be sure you stole me.

Agloe is a scrubbed initial of the two people who created this map, Ernest Alpers and Otto [G.] Lindberg, who released it in 1937.

Decades later, Rand McNally published a map of Aglow, New York, at the exact same intersection of two dirt roads off the beaten track.

Well, you can imagine the joy in general drafting.

They immediately called Rand McNally and said, 'I got you!

Take off your pants and file a lawsuit! ”

And Rand McNally says, "No no no, Aglow is the real deal."

People kept going to the intersection of two dirt roads in the hope that there would be a place called Aglow (laughs), so they were hoping there would be a place called Aglow, but someone built a place in New York called Aglow.

(Laughter) In its heyday, there was a gas station, a grocery store, and two houses.

(Laughter) And, of course, this is a completely compelling metaphor for a novelist. Because we all want to believe that what we put down on paper can change the real world in which we actually live. That's why my third book is called Paper Towns.

But ultimately what interests me is the phenomenon itself rather than the medium in which this happened.

It's easy to say that the world shapes our world map, right?

Just as the overall shape of the world obviously influences our maps.

But what I find more interesting is that the way we map the world changes the world.

Because if the north fell, the world would be a really different place.

And the world would be a very different place if Alaska and Russia weren't on opposite sides of the map.

And the world would be a different place if Europe were projected at its actual size.

The world changes with our world map.

The ways we choose, our personal cartographic business, also shape the map of our life, which in turn shapes our life.

I believe that what we map can change the way we live our lives.

And I don't mean like secret Oprah's Angel Network, like you can figure out your own way out of cancer.

But I believe a map doesn't show you where you're going in life, but it does show you where you might go.

I rarely go places that aren't on my map.

So when I was a kid, I was a really bad student.

My GPA was consistently in the low 2s.

And I think the reason I was a terrible student was because I felt that education was a series of hurdles that were put up in front of me that I had to jump over in order to become an adult.

And I didn't want to jump over these hurdles. The hurdles seemed completely arbitrary and I often didn't jump over them. Then people threatened me, you know, they'll threaten me that they'll be on [my] permanent record, or that you'll never get a good job.

I didn't want to do a good job!

By the time I was 11 or 12, as far as I know, guys with good jobs got up very early in the morning (laughter) and one of the first things guys with good jobs did was put a choke around their neck.

They literally put a noose on themselves and went about their business, whatever it was.

That's not the secret to a happy life.

These people, in my symbol-obsessed 12-year-old imagination, strangle themselves as one of the first things they do every morning, and they can't be happy.

Why would I want to jump over all these hurdles and be done with it?

What a terrible ending!

And in tenth grade, I went to this school, Indian Springs School, a small boarding school outside of Birmingham, Alabama.

And suddenly I became a learner.

And I found myself in a learner community and became a learner.

I was surrounded by people who celebrated intellectualism and engagement, and who thought my sarcastic and very cool departure was neither wise nor funny, but a simple and sober reaction to a very complex and compelling issue.

So I started learning. Because it was great to learn.

We learned that some infinite sets are larger than others, we learned about iambic pentameter and why it sounds so pleasing to the human ear.

I learned that the Civil War was a nationalized conflict, learned physics, learned that correlation and causation should not be confused. By the way, all this literally enriched my life every day.

And while it's true that I don't use most of them for my 'work', that's not the point for me.

It's about mapping.

What is the cartographic process?

It's like sailing over a piece of land and thinking, 'I should paint that piece of land,' and then thinking, 'Maybe there's more land to paint.'

And that's when the learning really began for me.

It is true that there were teachers who did not abandon me. I was very lucky to have such teachers. Because I was often giving them cause to think there was no reason to invest in me.

But much of the learning I did in high school was not about what happened inside the classroom, but what happened outside of it.

For example, I can say, ``There's a certain tilt of the light, a winter afternoon -- it's as oppressive as a heavy cathedral tune.

The reason I can explain what opportunity cost is is that one day I was on the couch playing Super Mario Kart and my friend Emmett walked in and asked, "How long have you been playing Super Mario Kart?"

So I said, "I don't know, maybe six hours?" And he said, "Do you realize that if you worked those six hours at Baskin-Robbins, you could have made $30? So in a way, you paid $30 to play Super Mario Kart."

And I was like, "I'll take the deal."

(Laughter) But I learned what an opportunity cost is.

And in the process, the map of my life got better.

it got bigger. More locations were included.

There may be more, there may be more in the future.

It wasn't a formal, organized learning process, but I'm happy to admit it.

It was spotty, inconsistent, and full of ignorance.

You may have heard Cantor's idea that some infinite sets are larger than others, but you weren't sure about the calculus behind the idea.

You may have heard the concept of opportunity cost, but you didn't know the law of diminishing returns.

But the great thing about imagining learning as cartography instead of imagining it as arbitrary hurdles to jump over is that you can see part of the coastline and it makes you want to see more.

And now I know at least part of the underlying calculus of all of them.

So when I was in high school, I had one learning community, and in college I went to another learning community, and then another. After that, I started working for a magazine called "Booklist". As an assistant, I was surrounded by people who read amazingly well.

Then I wrote a book.

And like every writer dreams of doing, I quit my job immediately.

(Laughter) And for the first time since high school, I was miserable to realize that there was no learning community.

I hated.

I have read so many books in the last two years.

I read books about Stalin, how Uzbek people came to identify as Muslims, and how the atomic bomb was built, but I felt like I was creating my own hurdles and jumping them, instead of feeling the excitement of being part of a community of learners. A community of people working together in the business of cartography to better understand and map the world around us.

And in 2006, I met the man.

We didn't meet in person, we just met online.

At the time, Zee Franck was running a show called "The Show With The Franck", which I discovered, and that was the catalyst that brought me back to being a learner in the community again.

Here's what Ze talks about Las Vegas: (Video) Ze Frank: Las Vegas was built in the middle of a vast, hot desert.

Rocks, trees, waterfalls, almost everything here was brought from elsewhere.

These fish are as out of place as my pig that was flying.

So do these people, in contrast to the scorching desert that surrounds this place.

Here, things from around the world are reconstructed apart from their histories and people who experience them differently.

Improvements were made from time to time, and the sphinx also had an improved nose.

This New York means the same to me as it does to others.

Everything is out of context. So context allows everything: self-parking, event centers, Shark Reef, etc.

The falsification of this place may be one of the world's greatest achievements. Because no one belongs here. everyone does

As I was walking around this morning, I noticed that most of the buildings were giant mirrors reflecting the sun into the desert.

But unlike most mirrors that show an exterior view of themselves embedded in some place, these mirrors come back empty.

John Green: It makes me miss the days when you could see pixels in online videos.

(Laughter) Ze is not only a great intellectual, but a great community builder, and the community of people built around these videos was in many ways a community of learners.

So we worked together to play chess with Ze Frank and beat him.

We organized to take young people on a road trip across America.

We have turned the earth into a sandwich by having one person hold a piece of bread at one point on the earth and another person at the diametrically opposite point of the earth.

I know these are silly ideas, but they're also "learning" ideas, and that's what really inspired me. You can find communities like this everywhere you go online.

If you follow the calculus tag on Tumblr, yes, there are people complaining about calculus, but you'll also see people reblogging those complaints and claiming that calculus is fun and beautiful. This is how we think about problems that seem unsolvable.

You can go to places like Reddit and find sub-Reddits like "Ask Historians" and "Ask Science" to ask people in these fields a range of questions, from the very serious to the very silly.

But for me, YouTube is the most interesting growing community of learners on the Internet right now, and I am certainly biased.

But I think YouTube pages are in many ways similar to classrooms.

For example, see Minute Physics teaching the world physics: (video) So let's get down to business.

As of July 4, 2012, the Higgs boson is the last fundamental piece of the Standard Model of particle physics discovered experimentally.

However, one might wonder why the Higgs boson would have been included in the Standard Model alongside other well-known particles such as electrons, photons and quarks if the Higgs boson had not been discovered in the 1970s.

good question. There are two main reasons.

First, just like an electron is an excitation of the electronic field, the Higgs boson is just a particle that is an excitation of the pervasive Higgs field.

The Higgs field plays an important role in models of weak nuclear forces.

In particular, the Higgs field helps explain why the Higgs field is so weak.

We will discuss this in more detail in a later video, but although the weak nuclear theory was confirmed in the 1980s, the Higgs field is so closely intertwined with the weak force in the equation that its actual independent existence could not be confirmed until now.

JG: Alternatively, here's a video I made as part of a program about World War I, "Crash Course": (video) The direct cause was, of course, the assassination of Archduke Franz Ferdinand of Austria on June 28, 1914 in Sarajevo by a Bosnian Serb nationalist named Gavrilo Princip.

A quick digression: It is worth noting that the first great war of the 20th century began with an act of terrorism.

So Franz Ferdinand was not very well liked by his uncle, Emperor Franz Joseph – now that's a mustache!

Nevertheless, the assassination caused Austria to issue an ultimatum to Serbia, which accepted some but not all of Austria's demands, leading Austria to declare war on Serbia.

And Russia mobilized troops in alliance with the Serbs.

Germany was allied with Austria and asked Russia to stop mobilizing, but Russia refused. Germany then mobilized its own forces, declared war on Russia, strengthened its alliance with the Ottoman Empire, and declared war on France.

(Laughter) And it's not just physics and world history that people are choosing to learn through YouTube.

Here is a video about abstract mathematics.

(Video) So you are me and you are taking a math class. Because they have you in attendance every day.

And you, I don't know, are learning about sums of infinite series.

That's a high school topic, right?

I think that's why infinite series are allowed in the curriculum.

So, out of a very understandable need to be distracted, you're doodling or thinking about what the plural of "series" should be like "series", "series", "seriessen", "seri?", rather than about the topic at hand.

Or should the singular be changed to "series" or "serum" in the same way "sheep" is changed to "shoup"?

But the whole concept, such as 1/2 + 1/4 + 1/8 + 1/16, is closer to 1, which is useful if, for example, you want to draw lines of elephants, each with the tail of the next elephant. Regular elephants, juvenile elephants, cubs, dog-sized elephants, puppy-sized elephants, and all the way to Fang-san.

This is great, at least a little bit. Because you can put an infinite number of elephants in a row and still fit on one notebook page.

JG: And finally, this is Destin from "Smarter Every Day." We are talking about conservation of angular momentum. And since this is YouTube, Cat: (video) Hi, it's me, Destin. Welcome to "Smarter Every Day".

So you've probably noticed that cats almost always land on their feet.

Today's question is "why?".

As with most simple questions, there are very complex answers.

For example, let's rephrase this question. How does a cat move from feet up to feet down in a descending frame of reference without violating the law of conservation of angular momentum?

(laughter) JG: So what all four of these videos have in common is this. All of them have over 500,000 views on YouTube.

And because they're part of the learning community that these channels are establishing, not the people watching them in the classroom.

I said earlier that YouTube is like a classroom for me, and in many ways it's like a classroom. Because we have an instructor here. It's like an old school classroom. There's an instructor here, and below that instructor are the students, and they're all having a conversation.

I know that YouTube comments have a very bad reputation in the internet world, but when you actually go to comments on these channels, you find people interested in the subject, asking difficult and complex questions about the subject, and other people answering those questions.

The YouTube page is set up so that I'm talking to you on the exact same page, so you're participating in the conversation in a live, real, and active way because I'm talking to you on the exact same page as your comment.

I usually comment, so I will participate together.

And whether it's world history, mathematics, science, or whatever, you'll find it.

We also see young people using internet tools and certain genres to create a space of intellectual engagement rather than the cynical indifference that most of us probably associate with memes and other internet conventions.

Or here's Honey Boo Boo's critique of industrial capitalism: ["Free capitalism is not at all good for humanity.

Quite the opposite. It is a barbaric and destructive means of nihilism. ]] Just in case you don't know what she's saying...yes.

I truly believe that these spaces, communities, have become the kind of cartographic communities that I had in high school and then in college for a new generation of learners.

And as an adult, rediscovering these communities reconnected me with a community of learners, encouraging me to remain a learner as an adult and no longer feeling that learning was only for young people.

Vi Hart and "Minute Physics" taught me all sorts of things I never knew before.

And I know we all remember the time of the Enlightenment-era Paris Salons and the Algonquin Round Table and wish, "Oh, how I wish I could have been a part of that, how I wish I could laugh at Dorothy Parker's jokes."

But I am here to tell you that these places existed and still exist.

They exist in the far corners of the internet, and old people are afraid to set foot in them.

(Laughter) And I truly believe that we were just getting started when we invented the Aglow in New York in the 1960s and made it a reality.

thank you.

(applause)

All life, every living thing ever, is built according to the information in DNA.

what do you mean?

Just as the English language is made up of letters of the alphabet that, when put together into words, can tell the stories we're going to tell you today, DNA is made up of genetic letters that, when combined into genes, enable cells to make proteins. Strings of amino acids fold into complex structures that enable cells to fulfill their roles and tell their stories.

The English alphabet has 26 letters, while the genetic alphabet has 4 letters.

they are pretty famous. Maybe you've heard of it.

Often referred to simply as G, C, A, T.

But it's worth noting that all the diversity of life is the result of four genetic letters.

Imagine what would happen if the English alphabet had four letters.

What kind of story can you tell?

What if the genetic alphabet had more letters?

With more characters, could life tell different stories, perhaps even more interesting ones?

In 1999, my lab at the Scripps Research Institute in La Jolla, California, began working on this problem with the goal of creating organisms whose DNA consisted of a six-letter genetic alphabet, four natural letters plus two new artificial letters.

Such a creature would be the first radically altered life form ever created.

It will be a semi-synthetic life form that stores more information than ever before.

It would be able to make new proteins, which are proteins built from the 20 or more normal amino acids normally used to build proteins.

What story could that life tell?

Through the power of synthetic chemistry and molecular biology and nearly 20 years of research, we have created a bacterium with six letters of DNA.

Let me tell you how we did it.

All you have to remember in high school biology is that four natural letters pair up to form two base pairs.

Since G pairs with C and A pairs with T, in order to create new letters, we synthesized hundreds of new candidates, new candidate letters, and examined their ability to selectively pair with each other.

And after about 15 years of research, I've found two that pair very well, at least in vitro.

They have complicated names, but let's call them X and Y.

The next thing we had to do was find a way to get X and Y into the cell. Eventually, they discovered that proteins that work similarly in algae also work in bacteria.

So the last thing we needed to do was show that cells can grow and divide and retain X and Y within their DNA when X and Y are provided.

Everything we've been up to has taken longer than I expected. I'm actually a really impatient person. But this most important step worked faster than I could have dreamed, basically straight away.

Over the weekend in 2014, a graduate student in my lab cultured a bacterium with six letters of DNA.

I would like to take this opportunity to introduce you.

This is their actual photo.

These are the first semi-synthetic organisms.

Bacteria with six letters of DNA, that's really cool, isn't it?

Maybe some of you are still wondering why.

So let's go into a little more detail on some of our motivations, both conceptual and practical.

Conceptually, ever since people had thought, they have wondered what life is and how it differs from non-living things.

Life was interpreted by many as perfect, and this was taken as evidence of a Creator.

Living things are different because God breathed life into them.

Some people want a more scientific explanation, but I think it's fair to say that they still think the molecule of life is something special.

So evolution has been optimizing them for billions of years, right?

From any point of view, it would seem rather impossible for a chemist to step in and build new parts that would work within or with the natural molecules of life without screwing everything up in some way.

But how perfectly have we been created and evolved?

How special are the molecules of life?

Even asking these questions was impossible because we have nothing to compare life to.

For the first time, our research suggests that perhaps life's molecules aren't all that special.

Perhaps life as we know it isn't the only way.

Maybe we're not the only solution, maybe not even the best solution, just the solution.

These questions deal with fundamental questions about life, but they can seem a little daunting.

But what about practical motives?

Now, as we explore what new stories an organism with an expanded vocabulary can tell, remember that the stories here are the proteins that cells produce and their functions.

So what kinds of new proteins with new types of functions can our semisynthetic organisms make and even use?

Well, I have some thoughts.

The first is to get the cells to make proteins for us.

Proteins are used today in an increasingly wide variety of applications, from materials that protect soldiers from injury to devices that detect dangerous compounds, but the most interesting application, at least to me, is protein pharmaceuticals.

Despite being relatively new, protein drugs have already revolutionized medicine, insulin is also a protein, for example.

As you've probably heard, it is manufactured as a drug that has completely changed the way diabetes is treated.

But the problem is that proteins are very difficult to make and the only real way to get them is to get your cells to make them.

Naturally, therefore, natural cells can only make proteins from naturally occurring amino acids. As such, the properties those proteins can have and the applications they can be developed for should be limited by the nature of the amino acids that make up the proteins.

This is what 20 normal amino acids are strung together to make a protein. As you can see, it doesn't look that different.

It doesn't have that many different features.

Not that many different features are available.

Although they are much simpler than proteins, they are routinely constructed from a much wider variety.

Never mind the molecular details, but I think you can see how different they are.

And in fact, it's their differences that make them excellent medicines for treating a wide variety of ailments.

Therefore, it is very exciting to wonder what new protein pharmaceuticals could be developed if we could build proteins from more variety.

So could a semi-synthetic organism be made to create a protein containing new and different amino acids, perhaps selected to give the protein some desired property or function?

For example, many proteins become unstable when injected into humans.

They are quickly degraded or eliminated so they are no longer drugs.

What if new amino acids could be protected from the environment and attached with substances that protect them from degradation and removal, making proteins that would be better drugs?

Could we make proteins with pinky fingers that specifically grab other molecules?

Many small molecules have failed during their development as pharmaceuticals because they lacked sufficient specificity to find their targets in the complex environment of the human body.

So could we take these molecules and make them part of the new amino acids that, when incorporated into a protein, are targeted by that protein?

I founded a biotech company called Synthorx.

Synthorx stands for synthetic organisms, with an X added to the end. Because this is what biotech companies do.

(Laughter) Synthorx works closely with my lab and is interested in proteins that recognize specific receptors on the surface of human cells.

But the problem is that it also recognizes another receptor on the surface of the same cell, which causes toxicity.

So could we generate a mutant of the protein so that the portion that interacts with the second bad receptor is masked and blocked by a large umbrella, and the protein only interacts with the first good receptor?

Doing that is very difficult or impossible with normal amino acids, but not with amino acids specifically designed for that purpose.

Therefore, having semi-synthetic cells act as tiny factories to produce better protein pharmaceuticals is not the only potentially really interesting application. Because it is proteins that make cell activity possible.

So, if we have cells that make new proteins with new functions, can we get them to do things that natural cells cannot do?

For example, could we develop a semi-synthetic organism that, when injected into a person, seeks out cancer cells and secretes a toxic protein that kills them only if found?

Could we create different types of oil-eating bacteria to clean up oil spills?

These are just a few examples of stories that could be told in life with an expanded vocabulary.

It is wonderful.

Injecting semisynthetic organisms into humans and dumping millions of gallons of bacteria into the ocean or your favorite beach?

Oh wait, it actually looks pretty scary.

This dinosaur is really scary.

But there are pitfalls here. For our semi-synthetic organisms to survive, they must ingest the chemical precursors of X and Y.

X and Y are quite different from those found in nature.

Cells just don't have them or have the ability to make them.

So when we prepare them, when we grow them in a lab controlled environment, we can feed them a lot of unnatural food.

Then, if you place them in the body or on the shore of someone whose special food is no longer available, they can grow just a little bit and survive for a little while, perhaps long enough to perform their intended function, but then they start running out of food.

they start to starve.

They starve to death and just disappear.

So we can not only let life tell new stories, but we can tell it when and where to tell those stories.

At the beginning of this talk, I mentioned that in 2014 we reported the creation of semisynthetic organisms that store more information X and Y in their DNA.

But all the motivations we just talked about require cells to use X and Y to make proteins, so we started working on that.

Within a few years we showed that cells can take DNA with X and Y and copy it into RNA, the working copy of DNA.

And late last year, we showed that you can use X and Y to make proteins.

Here they are, the stars of the show, the first fully functioning semi-synthetic creatures.

(Applause) These cells are green because they make proteins that glow green.

It's actually a pretty famous jellyfish protein that many people use naturally because it's easy to tell they made it themselves.

However, within each of these proteins is a new amino acid that organisms in nature cannot build proteins from.

Every living cell, every cell that has ever lived, made all its proteins using the four-letter genetic alphabet.

These cells live, grow, and produce a six-letter alphabet of proteins.

These are the new ways of life.

This is a semi-synthetic life form.

So what does the future hold?

My lab is already working on expanding the genetic alphabet of other cells, including human cells, and is poised to begin studying more complex organisms.

Consider a semi-synthetic worm.

The last and most important thing I want to say to you is that the time has come for semi-synthetic living.

thank you.

(Applause) Chris Anderson: So Floyd, this is very remarkable.

Just a quick question, what does your research mean for how we should think about the potential for life in space and elsewhere?

Much of life, or much of our assumptions, seems to be based on the fact that of course it must be DNA, but is the potential space for self-replicating molecules much larger than DNA, even for six letters?

Floyd Romesberg: I ​​definitely think so. And, as I said earlier, what our research shows is that we are perfect, optimal, that God created us this way, that evolution perfected us this way, and so on.

We have made molecules that function like natural molecules. I think this suggests that any molecule that follows the basic laws of chemistry and physics and can be optimized can do what the natural molecules of life do.

There is nothing magical about it.

And I think that suggests that life could evolve in different ways. Perhaps they are like us with other kinds of DNA, or maybe they have no DNA at all.

CA: So, in your mind, how much room do you think there is in that possibility?

do we know too? Will most things be like DNA molecules, or will they be something radically different that can self-replicate and potentially give rise to life forms?

FR: My personal opinion is that even if you find new life, you may not even recognize it.

CA: So the obsession with looking for a Goldilocks planet in just the right place to have water and so on is probably a very narrow assumption.

FR: Well, if you want to find someone to talk to, maybe not, but if you're just looking for any form of life, I think that's right. I guess I'm looking for life under a light post.

CA: Thank you for surprising us. Thank you so much, Floyd.

(applause)

My favorite activist and punk rock musician Jello Biafra said:

“Don't hate the media, be the media,” he says.

I am an artist.

I love working with media and technology. Because Mr. A is well versed in media and technology and likes the power they have.

And B, I hate them and fear the power they hold.

(Laughter) In 2003, I remember watching an interview between Fox News host Tony Snow and then US Secretary of Defense Donald Rumsfeld.

They are talking about the recent invasion of Iraq, and Rumsfeld is asked, "I've heard about our body count, but never about theirs. Why?"

And Rumsfeld replied, "Well, we don't count other people's bodies."

right?

An estimated 150,000 to 1 million Iraqi civilians died as a result of the 2003 US-led invasion.

This figure is in stark contrast to the 4,486 US servicemen who died during the same period.

I wanted to do more than just make this horrifying number recognizable.

I wanted to create a memorial for the individual civilians who died as a result of the invasion.

War memorials, such as Maya Lin's Vietnam Memorial, are often gigantic in scale.

Very powerful and very one-sided.

I wanted my memorial to live and circulate in the world.

When I was a student, I remember our teacher giving us the classic civic assignment of getting a piece of paper and writing down the members of the government.

And we were told that if we wrote a really good letter and thought about it seriously, we would get more than just a formal letter back.

This is my "Notepad".

What appears to be a yellow legal tablet in everyday use is actually a memorial to individual Iraqi civilians who died as a result of the U.S. aggression.

"Notepad" is both a protest and a memorial activity disguised as an everyday paper tablet.

Zooming in on the lines of paper revealed microprinted text containing details, names, dates and locations of individual Iraqi civilians who died.

So over the past five years, I've been bringing tons of this paper and smuggling it into stationery supplies for the US and Coalition governments.

(Laughter.) (Applause.) No need to say that this is not the place to discuss how I did it.

(Laughter.) But I also meet one-on-one with members and former members of the so-called coalition that supported the invasion.

So I meet one of them whenever I can and share the project.

And last summer I had the opportunity to meet with Alberto Gonzalez, former US Attorney General and author of Torture Memos.

(Video) Matt Kenyon: Can I give this to you?

A special legal tablet.

This is actually part of an ongoing art project.

Alberto Gonzalez: Is this a special legal pad?

MK: Yes. Believe it or not, this is in the collection of the Museum of Modern Art in New York. I am an artist.

MK: And all the paper lines really -- AG: Do they disappear?

MK: No, they are microprinted text containing the names of individual Iraqi civilians who have died since the invasion of Iraq.

AG: Yes. OK.

Ag: Thank you. MK: Thank you.

(Laughter) The way he says "thank you" is really creepy.

(Laughter) Now, I would like each of you to look under your chair.

I have an envelope.

and open it

The paper in your hand details Iraqi civilians who died as a result of the invasion.

I would like a member of the government to use this paper to write.

You can help smuggle this civilian body count into government archives.

Because every letter sent to a government is, of course, sent worldwide, and every letter sent is archived, filed, and recorded.

Together we can put this in the mailbox or in front of those in power.

Anything sent will eventually become part of the government's permanent archives, a shared historical record.

thank you.

(Applause.) Tom Riley: So tell me, Matt, how did you get the idea for this "notepad"?

Matt Kenyon: I had just finished a project dealing with the US Coalition side of the war, and it was a black armband called an "instant sympathy device" that stored the name, rank, cause of death, and location of US servicemen who died overseas in real-time, and stuck into my arm every time the Pentagon or CENTCOM released the data.

There I noticed that there were scenes related to their own citizens dying abroad, but the number of casualties was disproportionately civilian.

TR: Thank you.

MK: Thank you.

(applause)

Seventy thousand years ago, our ancestors were insignificant animals.

The most important thing to know about prehistoric humans is that they didn't matter.

Their influence on the world was not as great as jellyfish, fireflies and woodpeckers.

In contrast, today we are in control of this planet.

And the question is, how did we get here from there?

How did we go from being self-obsessed insignificant apes in the corner of Africa to rulers of planet Earth?

Usually we look for differences between ourselves and all other animals at the individual level.

We want to believe that there is something special about me, my body, my brain that makes me better than a dog or a pig or a chimpanzee.

But the truth is, on a personal level, I am embarrassingly similar to a chimpanzee.

And if I had to take me and a chimpanzee to some isolated island and have a race to see who would survive, I would definitely bet on the chimpanzee and not on myself.

And this is not a bad thing for me personally.

I think the chimpanzees would do better if they took most of you alone and left you alone with the chimpanzees on some island.

The real difference between humans and all other animals is not at the individual level. It's on a collective level.

Humans control the Earth because they are the only animals that are flexible and cooperating in great numbers.

Now, there are other animals that can cooperate in large numbers, such as social insects, bees, and ants, but they are not as flexible.

Their cooperation is very strict.

There is basically only one way a beehive works.

And even with new opportunities and new dangers, bees cannot rebuild social systems overnight.

For example, you cannot execute a queen and establish a republic of bees or a communist dictatorship of worker bees.

Other animals, such as wolves, elephants, dolphins, and chimpanzees, which are social mammals, are much more flexible in their ability to cooperate, whereas cooperation among chimpanzees is based on intimate knowledge of each other, so only a few are able to do so.

I am a chimpanzee, you are a chimpanzee, and I would love to work with you.

I need to know you personally.

what kind of chimpanzee are you

Are you a gentle chimpanzee?

Are you an evil chimpanzee?

can you trust

I don't know you, how can I help?

We Homo sapiens are the only animals that combine these two abilities and are flexible enough to cooperate, and in very large numbers.

One to one, or ten to ten, chimpanzees might be better than us.

But put 1,000 humans against 1,000 chimpanzees and the humans will easily win. The reason is simple: 1,000 chimpanzees cannot cooperate at all.

And now, if you try to squeeze 100,000 chimpanzees into Oxford Street, Wembley Stadium, Tiananmen Square, or the Vatican, there will be chaos, utter chaos.

Imagine Wembley Stadium with 100,000 chimpanzees.

complete madness.

Humans, by contrast, usually get tens of thousands of people out there, but what they usually get there is not chaos.

What we get is a very sophisticated and effective collaborative network.

Whether building pyramids or flying to the moon, all of mankind's greatest achievements in history have been based on their ability to work together flexibly in large numbers rather than on their individual abilities.

Think about this very talk I am giving now. I'm standing here in front of an audience of about 300 or 400 people, most of whom are complete strangers to me.

Likewise, I am not familiar with all the people who organized and worked on this event.

I do not know the pilot and crew of the plane that brought me here to London yesterday.

I don't know who invented or built this microphone or the camera that records what I say.

I don't know who wrote all the books and articles I read in preparation for this talk.

I certainly don't know all the people who may be watching this talk over the internet somewhere in Buenos Aires or New Delhi.

Nevertheless, we can work together to create this global exchange of ideas without knowing each other.

This is something chimpanzees cannot do.

They communicate, of course, but you never see a chimpanzee go to a group of chimpanzees far away and talk about bananas, elephants, or anything else that chimpanzees might be interested in.

Now, cooperation is of course not always a good thing. All the horrible things humans have done throughout history, and we've done some pretty horrible things, and they're all based on massive cooperation, too.

Prison is a system of cooperation. Slaughterhouse is a system of cooperation. A concentration camp is a system of cooperation.

Chimpanzees have no slaughterhouses, no prisons, no concentration camps.

Now suppose I could probably convince you that yes, we rule the world because we can work together flexibly in large numbers.

The next question that immediately pops up in the minds of curious listeners is, "What exactly do we do?"

Why is it that, of all animals, only we can cooperate in this way?

The answer is our imagination.

We have the flexibility to work with countless strangers. Because of all the animals on earth, only we can create and believe in fiction, imaginary stories.

And as long as everyone believes the same fiction, everyone follows and follows the same rules, the same norms, the same values.

All other animals use their communication systems only to describe their reality.

A chimpanzee might say, "Look, there's a lion, let's run!"

Or, "Look! There's a banana tree over there! Let's go get some bananas!"

In contrast, humans use language not only to describe reality, but also to create new or fictional realities.

Humans can say, "Look, there's a God above the clouds!"

And if you don't do what I say, God will punish you and send you to hell when you die. ”

And if you believe this story that I made up, you can follow the same norms, laws, and values ​​and work together.

This is something only humans can do.

You can never persuade a chimpanzee to give you a banana, even if you promise to go to chimpanzee heaven when you die.

(laughter) "...and you will get a lot of bananas for your good deeds.

Please give me this banana. ”

A chimpanzee would never believe such a story.

Humans are the only people who believe stories like this, and that's why we rule the world, but chimpanzees are locked up in zoos and laboratories.

Now, in the field of religion, it might seem acceptable for humans to believe the same fiction and cooperate.

Millions of people gather to build cathedrals and mosques, to fight in crusades and jihad. Because they all believe the same story about God, Heaven and Hell.

But what I want to emphasize is that exactly the same mechanisms underlie all other forms of large-scale human cooperation, not just in the realm of religion.

For example, consider the legal field.

Today, most legal systems in the world are based on a belief in human rights.

But what are human rights?

Human rights, like God and Heaven, are just stories we make up.

They are not objective realities. They are not some biological effect on Homo sapiens.

If you take a human, cut it open, and look inside, you find hearts, kidneys, neurons, hormones, DNA, but nothing right.

The only place you'll find your rights is in the stories we've invented and spread over the past centuries.

They may be very positive stories, very good stories, but they are still just fictional stories that we make up.

The same is true in the field of politics.

The most important element in modern politics is the state and the state.

But what is a nation or nation?

They are not objective realities.

Mountains are an objective reality.

You can see it, you can touch it, you can smell it.

But nations and nations like Israel and Iran, France and Germany, these are just stories that we make up and that we are so attached to.

The same is true in the economic field.

Businesses are the most important actors in today's global economy.

Perhaps many of you today work for companies like Google, Toyota, McDonald's, and others.

What are they all about?

They are what lawyers call legal fiction.

They are stories invented and maintained by powerful magicians we call lawyers.

(Laughter) So what do companies do all day?

Most of the time they try to make money.

But what is money?

Again, money is not an objective reality. It has no objective value.

Bring me this green paper, dollar bills.

Look, it's worth nothing.

You can't eat, you can't drink, you can't wear.

But then the master storytellers, the big bankers, the finance ministers, the prime ministers, etc., came along and told us very compelling stories. "Look, can you see this green paper?

It's actually worth 10 bananas. ”

And if I believe it, and you believe it, and everyone believes it, it really works.

Take this worthless scrap of paper to the supermarket and give it to a total stranger you've never met, and in exchange you'll get a real banana you can actually eat.

This is amazing.

A chimpanzee can never do that.

Of course the chimpanzee makes the deal, "Yes, you can give me a coconut, I'll give you a banana."

It works.

But you give me a worthless piece of paper and you give me bananas?

no way!

What do you call me human?

(Laughter) In fact, money is the most successful story mankind has ever invented and told. Because money is the only story everyone believes.

Not everyone believes in God, not everyone believes in human rights, not everyone believes in nationalism, but everyone believes in money and dollar bills.

So is Osama bin Laden.

He hated American politics, American religion, and American culture, but had no problem with the American dollar.

In fact, he liked them very much.

(Laughter) The bottom line is that we humans are in control of the world because we live in a dual reality.

All other animals live in an objective reality.

Their reality consists of objective beings like rivers, trees, lions and elephants.

We humans live in an objective reality.

Our world also has rivers, trees, lions and elephants.

Over the centuries, however, we have built on top of this objective reality a second layer of fictitious reality, a reality consisting of fictitious entities such as nations, gods, money, and corporations.

And the amazing thing is that as history unfolded, this fictional reality became more and more powerful, and today the most powerful forces in the world are these fictional beings.

Today, the very survival of rivers and trees, lions and elephants depends on the decisions and aspirations of fictitious entities such as the United States, Google, and the World Bank, entities that exist only in our own imagination.

thank you.

(Applause) Bruno Giussani: Yuval, you have a new book.

After Sapiens, you wrote another book. It has been published in Hebrew, but has not yet been translated...

Yuval Noah Harari: I translate as I speak.

BG: In this book, if I understand correctly, you argue that the amazing progress we are currently experiencing will not only potentially improve our lives, but - and to quote you - will create "new classes and new class struggles, just as the Industrial Revolution did."

Could you please elaborate?

YNH: Yes. The Industrial Revolution saw the birth of a new class, the urban proletariat.

And much of the political and social history of the last 200 years has concerned what to do with this class and the emerging problems and opportunities.

Now we are witnessing the creation of a new large class of useless people.

(Laughter) As computers become more powerful in more and more areas, it's clear that they can outperform humans in most tasks and make humans unnecessary.

And the big political and economic question of the 21st century will be "What do we need humans for?" or at least "What do we need so many humans for?"

BG: Are there any answers in the book?

YNH: Our best guess at the moment is to keep them happy with drugs and computer games...

(Laughter) But this doesn't seem like a very attractive future.

BG: So basically you're saying in the book, and now that despite the argument that there's mounting evidence of significant economic inequality, we're still kind of at the beginning of that process?

YNH: Again, this is not prophecy. We see all sorts of possibilities before us.

One possibility is the creation of a new large class of useless people.

Another possibility is that humanity is divided into different biological castes, with the rich being elevated to virtual gods and the poor being reduced to this level of uselessness.

BG: I have a feeling there will be another TED Talk in a year or two.

Yuval, thank you for the trip.

YNH: Thank you!

(applause)

Imagine a place where neighbors greet your child by name. A place with great views. A place where you can put a yacht on the water in just 20 minutes by car.

It's a magical place.

i don't live there

(Laughter) But I did the 27,000-mile trip for two years to the fastest growing whitest county in America.

What is Whitepia?

I define white peers in three ways. First, Whitopia has registered at least 6% population growth since 2000.

Second, most of its growth is due to white immigration.

And third, Whitopia has an indescribable charm, it looks and feels comfortable.

(Laughter) I immersed myself in each of the three Whitopias for several months to find out how and why they tick. The second is Coeur d'Alene, Idaho. The third is Forsyth County, Georgia.

Your first stop is St. George. It is a beautiful town with red rock scenery.

In the 1850s, Brigham Young sent his family to St. George to grow cotton because of the hot, dry climate.

So they called it Dixie of Utah, a name that remains to this day.

Like an anthropologist, I spent my time at each White Pier.

I made spreadsheets detailing all the power brokers in the community, who they needed to meet and where they needed to be, and joined these communities enthusiastically.

I've been to zoning board meetings, and I've been to Democratic clubs and Republican clubs.

I went to poker night.

In St. George, I rented a house in the Entrada, one of the town's premier gated communities.

There was no Motel 6 or Howard Johnson for me.

I lived at White Pier as a resident, not a visitor.

I rented this house by phone.

(Laughter) (Applause) Golf is the perfect enchanting symbol of Whitopia.

When I traveled, I almost never took a golf club with me.

By the time I retired, I was playing golf at least three times a week.

(Laughter) Golf helps people bond.

Some of the best interviews I recorded during my travels were at golf courses.

For example, a venture capitalist invited me to play golf at a private club with no minority members.

I also went fishing.

(laughter) I had never fished before, so this guy had to teach me how to cast a line and what bait to use.

I also played poker every weekend.

It was Texas Hold'em with a buy-in of $10.

My poker buddies may have been bluffing about the hands they drew, but they weren't bluffing about social beliefs.

Some of the rawest, saltiest conversations I've had on my travels have been at poker tables.

GungHo Entertainer.

I love to cook and have hosted many dinner parties. In return, people invited me to dinner parties, barbecues, pool parties, and birthday parties.

But it wasn't all fun.

Immigration proved to be a major problem in this Whitopia.

St. George's Citizens' Council on Illegal Immigration held regular and active protests against immigration, so what I gleaned from this Whitopia is how hotly debated this would be.

It was a real-time preview, so it did.

Next destination: Almost Haven. This is my own rented cabin in Coeur d'Alene in the beautiful Northern Idaho Panhandle.

I also rented this place myself over the phone.

(Laughter) The book A Thousand Places To See Before You Die describes Coeur d'Alene, a gorgeous paradise for hunters, boatmen and fishermen.

The growth in my golf skills has helped me in Coeur d'Alene.

Played golf with retired LAPD officers.

In 1993, after the Los Angeles race riots, about 11,000 families and police officers fled Los Angeles to northern Idaho to build an expat community.

Given the conservative nature of these cops, it's no surprise that Northern Idaho has a strong gun culture.

In fact, Northern Idaho is said to have more gun dealers than gas stations.

So, what should be done in order for the residents to blend in?

I hit the gun club.

When I rented a gun, the gentleman behind the counter was quite pleasant and helpful until I showed him my New York City driver's license.

Then he got nervous.

My shot isn't as bad as I thought.

What I learned in Northern Idaho is that it's a peculiar brand of paranoia that can permeate a community when there are so many cops and guns around.

In northern Idaho, I used to load notepads in a red pickup truck.

And on that notepad I counted more Confederate flags than black people.

In Northern Idaho, I found Confederate flags on key chains, mobile phone paraphernalia, and cars.

About a seven-minute drive from my hidden lake hut was the grounds of the Aryan Nations, a white supremacist group.

America's Promise Ministries, the religious arm of the Aryan people, happened to have a three-day retreat during my visit.

So I decided to crash it.

(Laughter) As far as I know, I'm the only non-Aryan journalist who has ever done that.

(laughs) There are many memorable episodes from that retreat…

(laughter) ... when Abe, an Aryan, sat next to me.

He tapped me on the knee and said, "Hey Rich, I just want you to know one thing.

We are not white supremacists. We are white separatists.

We don't think we're better than you, we just want to stay away from you. ”

(Laughter) In fact, most white people in Whitopia are neither white supremacists nor white separatists. In fact, they're clearly not there for racial reasons.

Rather, they migrate there for familiarity, comfort, security and security. These reasons are implicitly associated with being white itself.

Our next destination was Georgia.

In Georgia, I stayed in the northern suburbs of Atlanta.

I discovered poker in Utah. I found a gun in Idaho. In Georgia I found God.

(laughter) My immersion in this Whitopia was working with the Church of the First Redeemer. This massive church is so huge that it even has golf carts that escort congregations through the many on-campus parking lots.

I was actively involved in youth service activities.

And personally, I was more comfortable in White Pier than in Colorado, Idaho, or even the suburbs of Boston.

That's because whites and blacks are historically familiar with each other in Georgia.

In this White Pier I was not very exotic.

(Laughter) But what does this mean?

The Whitopian dream, Whitopian migration is a push-pull phenomenon, full of alarming pushes and fascinating pulls, Whitopia operates on a level of conscious and unconscious bias.

It is possible for people to stay in Whitopia for racist reasons, even if it has racist consequences.

Many Whitepians feel pushed by illegal immigrants, social welfare abuses, minorities, population density and overcrowded schools.

Many Whitepians feel drawn to the merits, the freedoms and the allure of privatization: privatized places, privatized people and privatized things.

And I learned at Whitopia how a country can have racism without a racist.

Many of my smug urban liberal friends couldn't believe I would embark on such an adventure.

The reality is that many white Americans are affable and kind.

Interracial relationships—the way we treat each other as human beings—have gotten a lot better than they did in my parents' generation.

Can you imagine me going to Whitopia 40 years ago?

What a trip it was!

(Laughs) Still, some things haven't changed.

America is as segregated today as it was in the 1970s, both residentially and educationally.

As Americans, we often find ways to cook for each other, dance together, and entertain each other, but why can't that translate into how we treat each other as a community?

It's a devastating irony that shows us moving forward as individuals and falling back as a community.

One of the Whitepian observations that really struck me was the saying, "One black man is a delightful dinner guest, but 50 black men are a ghetto."

One of the big backdrops that animated my Whitopia journey was the year 2042.

By 2042, whites will no longer be the majority in America.

So will there be more Whitopias?

Seen in this light, the danger of whitopia is that the stronger the racism, the less conscious and unconscious prejudices we can see and face.

I embarked on a two-year, 47,000-mile journey to find out where, why, and how white people were fleeing, and I never expected this journey to be so enjoyable.

(Laughter) I never thought I would learn so much about myself.

I don't think I will live in Whitepia or Blacktopia.

I would like to continue playing golf if the opportunity arises.

(Laughter) And then we have to get the guns and the Great Church back to Whitopia.

thank you.

(applause)

I love infographics.

As an information designer, I have worked with all kinds of data for the past 25 years.

I have some insights I'd like to share, but before I do, a brief history.

Communication is the encoding, transmission and decoding of information.

A breakthrough in communication marks a turning point in human culture.

Verbal, literate and numeracy were major advances in communication.

These enable you to encode ideas into words and quantities into numbers.

Without communication, we would still be stuck from the Stone Age.

Humans have been around for 250,000 years, but the original texts began to surface only 8,000 years ago.

Almost 3,000 years later, the first proper writing system was formed.

Maps have been around for thousands of years and diagrams for hundreds of years, but representing quantities through graphics is a relatively new development.

It wasn't until 1786 that William Playfair invented the first bar chart, creating a visual display of quantitative information.

Fifteen years later he introduced the first pie and area charts.

His invention is still the most commonly used chart format today.

Florence Nightingale invented the cattle den in 1857 to give a presentation to Queen Victoria on army mortality.

Highlighted in blue, she showed how she was able to prevent most of the soldier's deaths.

Shortly after, Charles Minnall charted Napoleon's march to Moscow, depicting how battles, geography, and frigid temperatures had taken their toll, reducing his army from 422,000 to just 10,000.

He combined Sankey charts with cartography and temperature line charts.

I get excited when I have a lot of data to work with, especially when it produces interesting chart formats.

Here, the nightingale cockscomb served as the inspiration for organizing data on thousands of federal energy subsidies, scrutinizing the underinvestment in renewable energy over fossil fuels.

This Sankey diagram shows the flow of energy in the US economy and highlights how nearly half of the energy used is lost as waste heat.

I love being able to manipulate data into beautiful shapes.

Here, we can weave together arcs of personal and professional connections among women in Silicon Valley, just as we can map the collaborations of inventors that have spawned patents around the world.

I also made a chart.

I like numbers, so I rarely win at Scrabble.

I made this diagram to help you remember all the 2- and 3-letter words in the official Scrabble dictionary.

(Laughter) Knowing those 1,168 words is certainly a game changer.

(Laughter) Sometimes I write code that quickly generates graphics from thousands of data points.

You can also create interactive graphics by doing some coding.

We can now navigate information on our own terms.

Exotic chart formats sure look cool, but something as simple as a small dot might be enough to solve certain thought tasks.

In 2006, The New York Times redesigned its "markets" section, reducing it from 8 pages of stock listings to just 1.5 pages of key market data.

We've listed performance metrics for the most common stocks, but we wanted to help investors see how stocks are trending.

So I added a simple little dot to show the current price compared to the one-year range.

Value investors can spot stocks trading near lows at a glance by looking for dots on the left.

Momentum investors can spot stocks on an upward trajectory from the points on the right.

Shortly after, The Wall Street Journal copied the design.

Simplicity is often the goal for most graphics, but sometimes you need to embrace complexity and maximize display of large data sets.

Alec Gallup, former president of the Gallup organization, once handed me a very thick book.

It was his family legacy, hundreds of pages covering 60 years of presidential approval data.

I told him I could graph the whole book on one page.

"Impossible," he said.

And that's 25,000 data points per page.

At first glance, most presidents start out with high approval ratings, but few sustain them.

When an event like a war happens, the approval rating rises at first. Scandals trigger decline.

These major events were annotated in the diagrams but not in the book.

The point is that graphics can transmit data with amazing efficiency.

Graphics (the ability to read and write graphics) is still in its infancy.

New chart formats will emerge and special dialects will evolve.

Graphics that help you think faster and see a book's worth of information on one page are the key to new discoveries.

Our visual cortex is built to decipher complex information and is a master of pattern recognition.

Graphics capabilities let you take advantage of the built-in GPU to process massive amounts of data and find hidden gold veins within.

thank you.

(applause and cheers)

A few years ago, I received a call from the highest legal authority in Georgia, the Attorney General.

The moment was like an alarm clock.

It was 2013 and the city of Atlanta was hosting the Final 4 basketball tournament.

AG called and asked if the company I worked for would sponsor billboards around the city as part of an anti-trafficking campaign.

He said this was important because sex trafficking surged along with major sporting events and competitions.

And billboards help raise awareness.

To be honest, at first I thought I would politely decline.

(Laughter) Let's be honest, there are thousands of things that American companies can get involved with.

Sex trafficking seemed a little nasty.

It's a bit too difficult, so it's better to leave it to someone else.

But then I started to understand and learn just how big the problem really was.

And it seems that it is also prevalent in my company's hometown.

I lived and worked in Atlanta for many years.

I am a lawyer here.

I didn't realize that my children were born in one of the most prevalent sex-trafficking cities in the United States.

Atlanta's illegal sex trade generates up to $290 million a year, according to the latest report.

That's more than the city's illegal gun and drug trade combined.

So we mustered up our courage and helped make a sign.

But I couldn't help but feel that it wasn't enough.

The parent in me, the mother in me needed to do more.

When I started talking to people about this, I was inevitably surprised because the conversation started out of curiosity, like, "Really? Does this happen here?"

To empathy: "Wow, something has to be done about that."

Condemnation: "You're not saying all prostitutes are victims, are you?

I mean, don't they know what they're getting into? ”

Ok, I can understand why people get confused.

So let me be clear, the people I am talking to did not choose this life.

They are coerced, duped, or coerced.

In fact, this is the legal definition of adult trafficking in federal law.

Now, when it comes to children, minors under the age of 18 automatically become victims when they are taken, facilitated or used in commercial sexual activity.

It doesn't matter if violence, deception or coercion is used.

There are no age, gender or socioeconomic barriers to this crime.

It's about a 16-year-old girl I met in Washington DC.

She was trafficked between the ages of 14 and 16.

She was a victim of the foster care system.

And she told me they were selling up to 5 times a day.

She didn't even know the word "human trafficking." She thought it was just part of her life as a foster child.

Sex trafficking also occurs in wealthy neighborhoods and gated communities.

And men lure young girls into sex trafficking situations with modeling contracts and cell phone promises.

Sometimes they are kidnapped on the street.

An estimated 200,000 to 300,000 girls and boys are expected to be used for commercial sex trafficking each year in the United States.

That's right, girls and boys.

The International Labor Organization estimates that up to 1 million children are victims of sex trafficking worldwide each year.

The number is huge.

So while billboards are generally great for raising awareness, they are not enough to put an end to this problem.

I believe that if we are going to take sex trafficking seriously, we cannot enact or arrest ways out of modern-day slavery.

If we really want to end sex trafficking in the United States, we must systematically educate and target demand.

And I think the business world is perfectly positioned to do just that.

So sex trafficking is big business.

We also propose a customer-oriented business plan.

And in the sex industry, the customer is called John.

He is the man who fuels demand for sex trafficking.

Johns doesn't fit neat stereotypes.

But there is one universal truth. That is, there is no John, no buyer, no victim.

So if you want to start putting a stop to sex trafficking, you need to contact John.

And companies can do it while he's at work.

There is an organization called Businesses Ending Slavery and Trafficking, or BEST for short.

And when we launched the company in 2012, we did some research on Seattle-based Johns.

And do you know what they found?

John and his friends are ordinary men who work for a local company.

The age group ranges from 18 to 84 years old.

Johns are fathers.

The Johns admit to buying sex while on business trips, attending sporting events, or serving in the military.

But here's the kicker.

A BEST study found that web-based prostitution spikes at 2pm.

In other words, these Johns are likely to be prostitutes during working hours.

I believe there are ways to stop Johns on duty from prostitution.

Businesses can do that in three easy ways.

The first is policy.

The company has a policy that clearly states that prostitution is prohibited at work, using company resources or on company time.

That is correct.

My point is that the handbook should give specific examples of prohibiting prostitution during travel and at international trade fairs.

Now, the value of a policy is determined by its enforcement and communication.

Some of Johns' research shows that the best way to deter them is to publicly humiliate and embarrass them.

Therefore, companies that take breaks or cover up and do not fire Johns when they find him prostituted using company equipment and resources are complicit in fueling demand.

Well, policies are one of the best ways to start.

The second method is employee education.

Companies can go a long way by simply training their employees on the signs and red flags of human trafficking.

This was my "Ah!" See how our company can make a difference.

Our highways, airports and truck stops are literally being used as modern slave routes.

We have over 100,000 drivers nationwide and around the world.

So it made perfect sense to train them to recognize red flags.

We don't want them to go out there and do things on their own, so we want them to call a number, a hotline, and have law enforcement intervene.

So we teamed up with an organization called Truckers Against Trafficking.

The Colorado-based organization provided truck drivers with web-based support and materials that gave them exactly what they needed to spot the red flags.

Like hearing CB chatting on the radio about a girl at a nearby exit, for example.

Or witnessing an underage woman emerge from a car in a truck stop parking lot.

As we rolled out this training, some intrepid drivers admitted that they had seen women knocking on taxis at truck stops looking for customers.

I will not buy it now.

But they also didn't know enough to make a phone call.

And that's what we want them to do.

The TAT group, Truck Drivers Against Human Trafficking, also emphasizes the need for men to talk to other men about web-based sex trafficking and not to engage in commercial sex trafficking.

It features men in uniforms proudly declaring their reasons not to buy.

If we are to make a cultural shift in this atrocity, men need to talk to other men about the underlying issues fueling demand.

Because sometimes the Johns don't even know they're buying enslaved girls.

So let's think about the last way companies can help.

Every company has special resources, secret sauces and resources they can offer to fight human trafficking.

For example, Visa, Master Card, and American Express refuse to process transactions from backpage.com, an online sex site that made commercial prostitution worth as much as $9 million per month.

In April 2018, backpage.com and its affiliated websites were shut down and all its assets seized by the FBI.

Hiring survivors is another way any company can help.

Randstad, an organization that works with businesses to find survivors in need of good jobs, has an excellent program called Higher Hope.

We used this program. we know it works.

In addition to training flight attendants and airline crews, Delta also provides survivors with SkyMiles through a program called SkyWish to help them escape traffickers and reunite with their families.

There are thousands of things companies can do.

They just decide what to do to join the fight.

No one can justify slavery today.

But I still believe this remains one of the greatest atrocities against civil rights of our time.

Fortunately, the business community is uniquely positioned to help train employees, implement policies, and deploy special resources to combat human trafficking.

and what about you?

What if you decide to learn the red flags?

What if you saw the signs around you and decided to make a phone call?

There are no penalties for reporting to law enforcement if you find something incorrect.

Together, we can all protect our children, educate the workforce around us, and improve the society in which we live and work with John.

thank you.

(applause)

For the past ten years, I have studied non-state armed groups: terrorists, rebels, militias and other armed groups.

I document what these groups are doing when not filming.

My goal is to better understand these violent actors and research ways to facilitate the transition from violent engagement to non-violent confrontation.

I work in the field, in the policy world, and in the library.

Warfare is changing, and understanding non-state armed groups is key to resolving most ongoing conflicts.

It used to be an interstate competition.

more than this.

It is now a conflict between states and non-state actors.

For example, of the 216 peace agreements signed between 1975 and 2011, 196 were between states and non-state actors.

Therefore, we need to understand these groups. Any dispute resolution process that needs to be successful requires engaging with them or defeating them.

So how do we do that?

We need to know what drives these organizations.

We know a lot about how they fight and why they fight, but no one cares what they do when they're not fighting.

But there is a link between armed struggle and unarmed politics.

It's all part of the same organization.

Without seeing the big picture, you cannot understand these groups, much less defeat them.

And today's armed groups are complex organizations.

Take Hezbollah in Lebanon, known for its violent confrontation with Israel, for example.

But since its creation in the early 1980s, Hezbollah has also established political parties, social service networks and military apparatus.

Similarly, Palestinian Hamas, known for its suicide bombings against Israel, has ruled the Gaza Strip since 2007.

So these groups don't just shoot.

they multitask.

They are launching complex communication machines including radio stations, television channels, internet websites and social media strategies.

And here is the ISIS magazine, printed in English and published for recruitment.

Armed groups are also investing in complex financing. It's not about looting, it's about building a profitable business. For example, a construction company.

Now, these activities are the key.

These allow these groups to increase their power, increase funding, boost recruitment and build their brand.

Armed groups are also doing other things. By investing in social services, we are building stronger bonds with our citizens.

They build schools, run hospitals, and establish vocational training and microcredit programs.

Hezbollah provides all these services and more.

Armed groups also seek to entice the public by offering them what the state does not: security and security.

The early rise of the Taliban, or the beginning of the rise of ISIS, in war-torn Afghanistan can also be understood by looking at the efforts by these groups to provide security.

Now, unfortunately, in cases like this, providing security came at an unbearably high price for the public.

But in general, the provision of social services fills the governance gaps left by governments and allows these groups to increase their power and power.

For example, Palestinian Hamas' victory in the 2006 elections cannot be understood without acknowledging the group's social activism.

This is a very complicated situation, but when we look at armed groups in the West, we can only think of the violent side.

But that alone is not enough to understand the strengths, strategies and long-term vision of these groups.

These groups are hybrids.

They rise to fill the void left by the government, to both arm themselves and to do politics, to engage in violent conflict, and to provide governance.

And the more complex and sophisticated these organizations become, the less we can think of them as the antithesis of the state.

Now what do you call a group like Hezbollah?

They run parts of the territory, manage all functions, pick up trash and run the sewage system.

is this a state? Is it a rebel group?

Or is it something else, something different and new?

What about ISIS?

The lines are blurry.

We live in a world of states, non-states and in-between, and the weaker the states, as in the Middle East today, the more non-state actors step in to fill the gap.

This is important for governments, as countering these groups requires increased investment in non-military means.

Closing the governance gap must be central to any sustainable approach.

This is also very important for peacemaking and peacebuilding.

A better understanding of armed groups will help us better understand what incentives can be provided to encourage a transition from violence to non-violence.

So, in this new competition between states and non-states, military power can win some battles, but it will not bring us peace or stability.

To achieve these objectives, we need long-term investments to close the security gaps—and the governance gaps that enabled these groups to thrive in the first place.

thank you.

(applause)

Let's go straight to the slide.

All I'm trying to prove with these slides is that what I'm doing is very simple.

And my ideas, in my head, are anyway very logical and related to what's going on and client problem solving.

I either end up convincing the client that I am solving the problem, or I actually solve the problem. Because clients seem to like it.

I will put it on the slides right away.

Could you turn off the light? under.

I like being in the dark

I don't want you to see what I'm doing here.

(Laughter) Anyway, I built this house in Santa Monica and it became very famous.

Actually, this appeared in the porn cartoon on the right slide.

(laughs) This is Venice.

Just showing this because I want you to know that I care about context.

On the left we have the context of a small house, and we tried to build a building that fits that context.

They look really weird when people photograph these buildings from that context, but my premise is that they become more meaningful when photographed and viewed in that space.

And once we've dealt with the context, you can see the slide on the right, we try to create a place that's comfortable, private, and fairly peaceful.

Then I went to Loyola Law School in downtown Los Angeles.

I was worried about creating a place to study law.

And we will continue to work with this client.

The building on the right is currently under construction.

The garage on the right -- the gray building -- will eventually be demolished and a few small classrooms will be placed along this street we built, this campus.

And it all has to do with clients and students stating that from their first meeting, they felt rejected.

They wanted a sense of place.

So the whole idea here was to create such a space in a downtown, hard-to-integrate neighborhood.

And it was my theory, or my point of view, that people did not liven up their neighborhoods, but they did.

I tried to include neighboring buildings, whether or not I liked them.

In the 60's I started using paper furniture and made a lot of very successful ones at Bloomingdale's.

The floor and walls are all made of cardboard.

And when it succeeded, I was in turmoil.

I couldn't handle the success of furniture and didn't feel confident enough as an architect, so I shut everything down and made furniture that no one liked.

(Laughter) So no one will like this.

And Ricky and I worked slice by slice before making these pieces.

And it kept failing after failing.

(Laughter) The piece on the left, which eventually led to the piece on the right, happened when the kid who was working on this took one of the long strings, folded it up and threw it in the trash.

As you can see, I rolled the tape around and found that it was able to sit on it and that it was very elastic, strong, etc.

So it was an accidental discovery.

I got hooked on fish.

(Laughter) So the story I'm telling is that I got mad at postmodernism and said at Pomo that fish were 500 million years ahead of us, and if we were going to go back, maybe we should go back to the beginning.

So I started making these funny things.

And so they began to have lives of their own, and grew like Walker's full glass.

Then he cut off the head, the tail, and everything else, and tried to translate what he had learned about the shape and movement of the fish.

And a lot of my architectural ideas that came out of that were accidental, too. It was intuitive. I went ahead with it and made a proposal for this building, which was just a proposal.

This building was made in Japan.

I was taken out for dinner after the deal for this little restaurant was signed.

And I love sake and Kobe and all that stuff.

And I was really drunk, so I was asked to sketch on a napkin.

(laughter) And I drew some sketches on a napkin. A little box or something like the Morandi I used to do.

The client then said, "Why are there no fish?"

So I painted a picture of a fish and left Japan.

Three weeks later, I received a complete set of drawings that I won the competition.

(Laughter) Well, it's hard. It's hard to transform a fish shape into a building or object like this. Because fish are so beautiful and perfect.

And Oldenburg, who I work with occasionally, said I couldn't do that. That made me even more excited.

But he was right—I didn't have a tail.

The head started to feel okay, but the tail did not.

It was pretty tough.

The one on the right is a snake shape, a ziggurat.

And I put them together and you walk between them.

It was also a dialogue with context.

Now, if you look at this photo from Architectural Record magazine and you don't see the background, you're probably thinking, "What a pushy guy."

However, my friend spent 4 hours walking around here looking for this restaurant.

Could not be located.

So...

(Laughter) As far as the craft and the technology and all the things you've been talking about, I've been completely tossed.

It was built in 6 months.

The way the drawings were sent to Japan was by using a magic computer in Michigan that creates sculptural models, created foam models and scanned them.

I drew a picture of fish and scales.

And when I got there everything was perfect except the tail.

So I decided to cut off the head and tail.

And the object on the left was made for the Walker show.

And I think it's one of the greatest pieces I've ever made.

Then my friend and client Jay Chiat asked me to build a headquarters building in Los Angeles.

I was late because I didn't want to speak.

I think toxic waste is an important clue.

So we built a temporary building -- I'm getting better at temporary -- and put a conference room there.

And finally, Jay took me to his hometown of Toronto, Canada.

And I have a story that when I was a kid, my grandmother used to buy carp on Thursdays and take them home and put them in the bathtub. This is a true story.

I played with it in the evening.

When I went to sleep, it was gone the next day.

And the next night we had gefilte fish.

(Laughter) So I set up this interior for Jay's office and made a pedestal for the sculpture.

He didn't buy the sculpture, so I made it.

I walked around Toronto and found a bathtub that looked like my grandmother's house and put fish in it.

(Laughter) I play with interesting people like [Cress] Oldenburg.

we have been friends for a long time.

And we started working on things.

A few years ago we put on a performance piece called “Il Corso del Cortero” (Swiss Army Knife) in Venice, Italy.

Most of the images are of Claes, but those two boys were my sons and were Claes' assistants in the play.

He was a Swiss Army knife.

He was a souvenir salesman and had always wanted to be a painter, and I was Frankie P. Toronto.

Palladian P.

Dressed up like Claes' AT&T building -- (Laughter) with a fish hat.

The performance highlight was at the end.

This beautiful object, the Swiss Army Knife, is a credit to my participation.

And I can tell you - it's totally Oldenburg.

I had nothing to do.

The only thing I did was allow the blades to rotate so I could sail this on canals. Because I love sailing.

(laughs) I made it a sailing ship.

I've been known to mess around with chain link fences and such.

I do that because it's a weird thing in a culture where things are made in so many quantities, absorbed in so many quantities, and so much denial about them.

people hate it.

And I am as fascinated by being one of those materials as I am with paper furniture.

And I am always drawn to it.

So I did a lot of dirty things with wire mesh, which no one will forgive me for.

But Claes paid tribute to it at Loyola Law School.

And that chain link is really expensive.

It's all in perspective.

Then we did a camp together for children with cancer.

As you can see, we started building together.

Of course, the milk can belongs to him.

But we were trying to clash our ideas and place objects next to each other.

Like Morandi, like little bottles, compose them like a still life.

And it seemed to work as a way to bond him and me.

Then Jay Chiat asked me to build this building on this strange site in Venice, and I started with this three-part project, and you went in the middle.

And Jay asked me what I was going to do with the middle part.

and he pushed it forward.

And then one day I experienced, oh well, the opposite.

I had a pair of Claes binoculars and put them there, but since then I couldn't put them down.

Oldenburg made the binoculars great when he sent me the first model of the actual proposal.

It made my building look bad.

And it was this interplay between such cutting edge things that was so interesting.

It leads to the building on the left.

And I still think the Time magazine photo is going to be the one with the binoculars, but it's omitted, oh my god.

I use a lot of metal in my work, and it's hard to associate it with the craft.

Everything in my house, using shoddy carpentry and everything, was a frustration with the available crafts.

I said, "If I can't get the craft I want, I'll use the craft I can get."

Rauschenberg and Jasper Johns had a lot of models for that, and many artists who used junk materials to make beautiful art and sculptures.

I got interested in metal because it was a way of building buildings that were sculptures.

And it was all made of a single material, and metal could be used not only for the walls, but also for the roof.

Metal fabricators often install ducts behind ceilings.

I was given the opportunity to design an exhibition for the Metalworkers' Union of the United States and Canada in Washington. And I did it on the condition that they would be my partner in the future and help me with all the metal buildings etc in the future.

And getting these people, the craftsmen, interested is going very well.

I just tell stories.

It is at least a way to connect with people who are very important to the realization of architecture.

Metal continued to the Herman Miller building in Sacramento.

And it's just a factory building complex.

And Herman Miller has a philosophy of having a place—a place for the people.

It's a cliché, but it's true that we wanted to create a central place with a cafeteria where people could meet and interact with working people.

I mean, it's off the beaten track and you get close to it.

copper and galvanized.

Due to the use of galvanized and copper with a very light gauge, it will buckle.

I spent a lot of time counteracting the Richard Meier aesthetic.

Everyone is trying to make their panels perfect, but I always try to make them rough and vague.

And in the end it looks like stone.

This is the central area.

There is a slope.

The small dome there is the Stanley Tigerman building.

Stanley helped me get this job.

And when I got the deal, the first thing I did was ask the client if he could have a cameo with Stanley.

Because these were the ideas we would talk about, build things side by side, and make things. Perhaps because it was all about urban metaphors.

So Stanley built a small dome.

I did the procedure by phone and fax.

He sent me a fax to show me something.

He built a building with a dome and built a small tower.

I told him, "No, no, that's too much.

I don't need a tower. ”

So he came back with a simpler building, but added interesting details to it and moved it closer to mine.

So I decided to put him into depression.

I put him in a hole to create a sort of hole for him to sit in.

And he built two bridges. This was all done over fax and back and forth over the course of several weeks.

And he put pink guardrails on these two bridges.

So I put this big sign behind it.

I call it "David and Goliath".

And that's my cafeteria.

In Boston there was that old building on the left.

It was a very conspicuous building away from the highway, so we added floors, swept it, repaired it, and used a kind of neighborhood language with protruding cornices. I thought so.

Mine is a little overgrown, but I used a beautiful material called lead copper, which turns green after 100 years.

Use 10 or 15 copper instead.

The sides of the building have been reworked and the window proportions have been readjusted to better fit the space.

Boston and I were surprised that it was approved because Boston has very strict design guidelines and I wouldn't normally think I fit into them.

Great attention was paid to details such as using lead-copper to create the panels and attaching them securely to the existing building structure.

On Las Ramblas in Barcelona, ​​for the film festival, I walked up and down the Hollywood sign and made a building out of it and they built it.

I took this photo one night on a plane.

But they made it a third smaller than my model without telling me.

And there's even more metal and some chain links in a small Santa Monica shopping center.

This is the University of Iowa's laser lab, where fish are abstracted back into the background.

It was a support lab, which incidentally didn't need windows.

I just joined the point.

The curved part has all mechanical equipment.

The solid wall behind it is Pipe Chase, or Pipe Canyon. I didn't need to have any protruding ducts or vents like this, so that was my chance.

Then I was given the opportunity to make a sculpture.

This is a small house somewhere.

It's been built so long I don't remember where it is.

located in the western valley.

And we started with the river and built houses along the river - we dammed the river and created a lake.

These are the models.

In fact, when it comes to the lake, the finish is pretty bad.

And I remembered why I play defensively at my house.

It's hard to get perfect corners and such when something has to be very cheap.

That big metal object is a passageway, and it's in it. Go downstairs to the living room, then down to the bedroom on the right.

It feels like a complete city.

I was asked to run a hospital for schizophrenic adolescents at Yale University.

I felt it was right for me to do so.

This is the house next door to Philip Johnson's house in Minnesota.

The owners had a dilemma and asked Philippe to do it.

he was too busy

By the way, he didn't recommend me.

(Laughter) In the end, it had to be a sculpture. Because there was a dilemma of how to build a building that did not resemble the language.

Will this beautiful site be subdivided?

etc

You get the idea.

And finally we were able to make it happen.

These people are art collectors.

And in the end I made it look very sculptural from the main house, with all the windows on opposite sides.

And walking around the building is very sculptural.

It's made of metal, and the brown one is finply, molded from Finnish wood.

I used it in Loyola's chapel and it didn't work.

I keep trying to get it working.

In this case, I learned how to describe it in detail.

Burnham Mall is on the left side of Cleveland.

It never ended.

Out on the lake you can see all the new buildings we built.

And I was blessed with the opportunity to build a building on this site.

There are railroad tracks.

This is some city hall and a courthouse.

And the center line of the mall is off.

Burnham designed a railway station that was never built, so we followed suit.

Here Sohio is on the axis and we are following that axis, these are two kinds of goalposts.

This is our building, the headquarters of the insurance company.

We worked with Oldenburg to fold up the newspaper and put it on top of it.

For Cleveland, the health club is secured to the garage with C-clamps.

(laughter) You drive off.

So, about the 10-story C-clamp.

And all the stuff at the bottom is a museum and very fancy car entrance idea.

This owner is upset about the poor entry of the car.

And it will be a hotel.

So we'll save the centerline of this thing and Perry and Cohn Pederson Fox and others will start to scale to the new building that's going on.

I feel much more comfortable here.

This is the property of Brentwood.

And long ago, around '82 or so, I designed myself a house after mine that would be a village with several pavilions around the courtyard. And the owner of this site worked for me to build the actual model on the left.

And she came back, and I think she was rich or something, but something happened and she asked me to design a house for her in this place.

And according to the basic idea of ​​the village, we changed it as we entered the village.

I cut off the rear end to secure the house in the lot. As you can see in the photos of the site, I sliced ​​it and placed all the bathrooms and dressing rooms like a retaining wall to create a lower level zone for the master bedroom. I designed it to look like a boat, sort of like a barge.

That's it.

The dome was a customer request.

She wanted a dome somewhere in her house.

She didn't care where she was.

I hope when you sleep in this bedroom - I mean, I haven't slept here yet.

I asked her to marry me so that I could sleep there, but she said there was no need.

But being in that room feels like you're on a lake barge somewhere.

And it's very private.

Landscapes are constructed to create private gardens.

And up there is a garden on this side of the living room and a garden on the other side.

I don't know how to proceed from here.

Focus on the one on the right.

There it is.

Left, that's my right.

Anyway, you enter a garden with beautiful trees.

That's the living room.

A guest bedroom with this marble dome.

Then enter the living room.

This is my bedroom.

From this floor, descend along the stairs to enter the bedroom here and into the lake.

And the bed is back in this space, and the window looks out over the lake.

These Stonehenge ones were designed to give this shallow site a foreground and create greater depth.

The material is lead copper like the building in Boston.

So my intention was to create a kind of grounds by delimiting this small piece of land (100 x 250) and turning the living room and dining room into tall pavilions.

It was a coincidence that I placed this on the axis of my dining room table.

It looks like you got a Baldessari painting for free.

But the idea is that the windows are all positioned so that you can see part of the house outside.

Eventually this will be screened -- these trees will be there -- and it will be very private.

And you will feel like you are in your own village.

This is for Michael Eisner, Disney.

We are doing some work for him.

This is a highway building in Anaheim, California.

Pass under this bridge at about 105 mph and you'll find another bridge here.

And you go through this room in a split second, and the building kind of reflects that.

The reverse side is more human, such as the entrance and dining room.

And here it is -- hopefully you can hear the sound effect of hitting the picket fence as you drive past.

It's kind of fun, isn't it?

I am building an office building for a furniture company in Basel, Switzerland.

And we struggled with images.

These are early studies, but they have to sell furniture to the public. So if it was too fancy when I made that building, people might say, "Well, that furniture looks okay in his, but no, it won't look great in my regular building."

So we built a kind of utilitarian slab here in phase two, taking out the conference facility and creating a villa, so that the common spaces can be very sculptural and self-contained.

Looking at it from my office, there is a kind of interaction between these parts.

It's on the Seine River in Paris.

Palais des Sports, Gare de Lyon here.

The Minister of Finance--a man transferred from the Louvre--enters here.

There is a new library across the river.

And back here, in this park that's already overgrown with trees, we're building a very dense building called the American Center. It has theaters, apartments, dance schools, museums, restaurants and all kinds of - this is a very dense program - bookstores.

Very narrow and small - this is ground level.

And the French spoil things in an unusual way, by stealing beautiful places and chopping off corners.

They call it Plan Coupe.

And I struggled with that - how to turn a corner.

These are the models.

I showed you another model. This is how I organized myself so that I could create the drawing. So I figured out the problem.

I was trying to get around this planning coupe -- how do I do that?

apartment etc.

These are the research models we have done.

I can see why I was prepared to commit suicide when I built this.

But that's where this solution finally came from. There, the elevator part worked from the front, parallel to this street, and parallel to here.

And this kind of ingenuity with balconies and skirts is like a ballerina lifting her skirt to enter the front door.

Restaurants, apartments, theaters and more here.

Therefore, except for this metal part, it will be built entirely of stone, French limestone.

and faces the park.

And the idea was to express that energy.

On the street facing side it's much more normal except for a few slipped mansards. So, back on topic, these residential units made a gesture around the corner.

And this will be some kind of high-tech billboard.

If any of you guys have any ideas please contact me.

I don't know what to do.

Jay Chiat is a big eater with a penchant for punishment and hired me to build him a house in the Hamptons.

And I keep thinking, "This is going to be the last fish."

I say, "I don't do it anymore, I don't want to do it anymore, I don't do it."

And I will do it.

(laughs) Yes.

And this piece is this - I don't know what it is.

I just added it so I had enough money in my budget to take something out.

(Applause) This is Euro Disney. I've worked with all of the people you mentioned earlier.

We had a lot of fun working together.

I think I came from Mars for them, and they think for me, but somehow we all manage to work together and productively.

recently.

This is a shopping story.

You enter the Magic Kingdom and the hotel where Tony Baxter's group operates.

And this is a kind of shopping mall with rodeos and restaurants.

and another restaurant.

What I did -- The skies in Paris were pretty cloudy, so I created a grid of lights perpendicular to the stations and train routes.

It looks as if it existed there and crashed all these simple forms there.

The light grid has lights and is lit up at night giving a sort of bright ceiling.

On the other side of Basel on the Rhine in Switzerland, actually in Germany, we created a furniture factory and a furniture museum.

And I tried -- here's a Nick Grimshaw building, here's an Oldenburg sculpture -- I tried to build an urban relationship.

I didn't show a very good slide, but it's just finished. But this piece here is this building, these pieces here and here.

And when we pass by, we find that it is always a part, and all these parts accumulate and become part of the whole neighborhood.

Just gypsum and zinc.

And if this were a museum, you'd be wondering what it's like inside.

If things get too busy and crazy, don't show anything and just wait.

I am very cunning and clever, but I made it quiet and wonderful.

But on the outside, it screams at you a little.

It's actually basically three square rooms with some skylights and such.

And from the building behind it, it looks like an iceberg floating on the hill.

I know we're running out of time.

Look, that skylight goes down and becomes that skylight.

So it's very quiet inside.

This is Disney Hall, that is, a concert hall.

It's a complicated project.

It has a chamber hole.

It relates to the existing Chandler Pavilion, which was built with a lot of love, tears and compassion.

It wasn't a great building, but we were optimistic that we would have a mutually reinforcing constructive relationship.

And this plan is a concert hall.

This is a foyer, a sort of garden structure.

There are commercial facilities on the first floor.

These are offices, but in fact the competition didn't require us to design them.

But finally there was a hotel there.

These are the sorts of relationships that were made to Chandler, composing these elevations together and relating them to existing buildings, such as MOCA.

The competition sound engineer gave us a baseline, which led to this compartmentalized plan, but after the competition we found that it didn't work at all.

But everyone liked these formats and loved the space, so that's one of the problems with the competition.

Then you have to try to get it back somehow.

And we studied many models.

It was three buildings: the Concertgebouw, Boston and Berlin.

Everyone loved surround.

Actually, this is the smallest hall, but it has two balconies, so it has more seats than any other hall.

Our client doesn't want a balcony, so when we met the new sound engineer he said this is the right shape or this is the right shape.

And we experimented with many shapes to capture the energy of the original design within an acoustically acceptable format.

We finally settled on a shape that matched the proportions of the Concertgebouw with its sloping outer walls. The sound engineer said this was important, but later decided otherwise, but now it's shaped like that.

(Laughter) And our idea is to make the seating carriage very sculptural and wooden, like a big boat sitting in this stucco room.

That's the idea.

And with skylights in the corners, these columns become structural.

And the good thing about introducing columns is that it creates a sense of proscenium wherever you sit, creating intimacy.

Now, this is not the final design, it's still nearing completion. So I'm not going to take this literally, except for the sense of space.

We used lasers to study acoustics and reflect lasers to see how everything works.

But you get a feel for the cross-section of the hall.

Most halls lead directly to the proscenium.

In this case, I put it back and put skylights on the four corners.

And it takes a completely different shape.

(Laughter) The original building was shaped like a frog, so it fit perfectly on the site and worked well.

Once inside the box, it becomes even more difficult to do. And here we are struggling with how to get the hotel in.

And this is the teapot I designed for Alessi.

I just pasted it there.

But this is how I work. I take pieces and pieces and look at them, wrestle with them, cut them off.

Of course it doesn't look like it, but that's the crazy way I do it.

Finally, in Los Angeles, I was commissioned to create a sculpture at the base of the Interstate Bank Tower, the tallest building in Los Angeles.

Larry Halprin is in charge of the stairs.

He asked me to give him a fish, so I gave him a snake.

(Laughter) This is a public space, a garden-like structure that you can walk into.

This is the tusk, which Larry puts water in, and it works much better than the fish.

Asked to fish in Barcelona, ​​Skidmore, Owings and Merrill work at the base of the Ritz-Carlton Tower.

And the Ritz-Carlton Tower is designed to be non-fireproof with exposed steel, just like an old gas tank.

So we took this bare steel word and transformed it into a fish shape to create something like a 19th century contraption to sit on. This is the beach and harbor in front, which is actually a shopping center with a department store.

And we split these bridges.

Originally, this was a solid with holes.

We cut them out to make some bridges and kind of the foreground for this hotel.

When I showed this to the hotel staff the other day, they were afraid that no one would come to the Ritz-Carlton because of this fish.

(Laughter) And finally, we brought in Lou Danziger.

I didn't expect Lou Danziger to be here, but I believe this is the building I built for him in 1964.

It's a small studio, but unfortunately it's for sale.

Time marches on.

This is my son who works with me in a small fast food business.

He designed a robot with a moving head to act as a cashier, and I did the rest.

And the food wasn't as good as the ingredients, so it failed.

It should have been the other way around - the food should have tasted good first.

thank you very much.

Today I would like to talk about dreams.

I've had lucid dreams all my life, and it's cooler than the movies.

(Laughter) It's not just flying, fire-breathing, and hot guys spontaneously appearing...

(laughs) I can read and write music.

An interesting fact is that in a dream I wrote a personal statement to the university.

And I accepted. So yes.

I am a very visual thinker.

Think in pictures, not words.

To me, words are more like instincts and language.

There are many people like me. For example, Nikola Tesla was able to visualize, design, test and troubleshoot all his inventions with precision in his mind.

Anyway, language is unique to our species.

I'm a little more primitive, kind of like a beta version of Google Translate.

(Laughter) My brain has the ability to be very focused on things that interest me.

For example, I once had a relationship with Calculus that lasted longer than some celebrity marriages.

(Laughter) I have some other oddities.

You may have noticed that my voice doesn't have much inflection.

That's why people often confuse me with GPS.

(Laughter) This can make basic communication difficult unless you need direction.

(laughs) Thank you.

(Applause.) A few years ago, when I started giving presentations, I went for my first headshot.

The photographer told me to look flirtatious.

(Laughter.) And I didn't understand what she was saying.

(laughter) She said, "When you're flirting with a guy, do it with your eyes."

"What kind?" I asked.

"Look, close your eyes."

So I tried it.

It was like this.

(Laughter) It looked like they were looking for Wally.

(Laughter) There's a reason for this, just like Wally is hiding.

(Laughter) I have Asperger Syndrome. Asperger's Syndrome is a form of high-functioning autism that impairs the basic social skills a person should exhibit.

It made life difficult in many ways and I struggled to adjust to society as I grew up.

My friends used to tell me jokes, but I didn't understand them.

My personal heroes were George Carlin and Stephen Colbert, and they taught me humor.

My personality changed from shy and awkward to rebellious and storm cursing.

Needless to say, I didn't have many friends.

I was also sensitive to texture.

For years I refused to take a shower because the water on my skin felt like a sting of needles.

However, I can assure you that my hygiene practices are now up to par.

(Laughter.) By the time I got here, my parents and I had been sexually assaulted by a colleague and it spiraled out of control, which made a difficult situation even worse.

And although I had to travel 3,000 miles across the country to get treatment, my life turned into an episode of The Walking Dead within days of being prescribed a new drug.

I became paranoid and began hallucinating that a rotting corpse was coming towards me.

My family finally rescued me, but by then I had lost 19 pounds in three weeks, developed severe anemia, and was on the verge of suicide.

I moved to a new treatment center who understood my disgust, trauma and social anxiety, knew how to treat it and was finally able to get the help I needed.

And after 18 months of hard work, I have achieved something incredible.

One of the hallmarks of Asperger Syndrome is that these people often have very complicated inner lives. As I know myself, I am a very versatile person with a wealth of ideas and a lot of things going on in my head.

But there is a gap between where it is and how I communicate it to the world.

This can make basic communication difficult.

Because I lacked social skills, few places would hire me. That's why I applied to Waffle House.

(Laughter) Waffle House is an exceptional 24-hour diner -- (Laughter) (Applause) Thank you -- you can order hash browns in a variety of ways that human corpses are processed...

(Laughter) Slice, dice, pepper, chop, top, lid, lid.

(Laughter) Conventional wisdom dictates that you should only go to Waffle House during the ungodly hours of the night.

(Laughter) One time, at 2 a.m., I was chatting with a waitress and asked, "What's the most ridiculous thing that happened to you at work?"

And one time a man came in naked, she said.

(Laughter.) I said, "Great! Sign up for the Graveyard Shift!"

(Laughter) Needless to say, Waffle House didn't hire me.

So in terms of being Asperger's Syndrome, it can be seen as a disadvantage and sometimes very painful, but vice versa.

It is a gift and enables innovative thinking.

At the age of 19, his research on coral reefs won a research competition and led him to publish and speak at the United Nations Convention on Biological Diversity.

(Applause.) Thank you.

(Applause.) And I'm 22, preparing for college and co-founding a biotech company called AutismSees.

(Applause.) Thank you.

(Applause.) But think about what I had to do to get here. 25 therapists, 11 misdiagnoses, and years of pain and trauma.

I've spent a lot of time wondering if there's a better way, and I think it's Autism Assistive Technology.

This technology could play an integral role in helping people with Autism Spectrum Disorder (ASD).

My company, AutismSees, has released an app, Podium, to help you assess and develop your own communication skills.

In addition to this, it tracks eye contact through the camera to simulate public speaking and job interview experiences.

So maybe after some more practice, Waffle House will hire me one day.

(Laughter) And one of the great things is that I used Podium to prepare for today, which was very helpful.

But that's not all.

We can do more.

For People with ASD -- Many innovative scientists, researchers, artists, and engineers are speculated to have ASD. Examples include Emily Dickinson, Jane Austen, Isaac Newton and Bill Gates.

But the problem we face is that communication barriers often keep us from sharing these great ideas.

As a result, many people with autism are neglected and exploited on a daily basis.

So my dream for people with autism is to change that situation and remove the obstacles that keep them from succeeding.

One of the reasons I love lucid dreaming is that it allows me to be free without judging the social and physical consequences.

It's soothing when you're flying over a landscape you've pictured in your head.

I am free from criticism, so I can do whatever I want.

I flirt with Brad Pitt, but Angelina is totally cool with it.

(Laughter) But the goal of autism assistive technology is bigger and more important than that.

My goal is to change the way people view people with autism and high-functioning Asperger's disorder. Because they have so much they can do.

See Temple Grandin, for example.

It allows people to share their talents with the world and move it forward.

Moreover, we give them the courage to pursue their dreams in real time in the real world.

thank you.

(Applause.) Thank you.

(applause)

I always remember the first time I met a girl in a blue uniform.

I was eight years old at the time, and I lived in the village with my grandmother, who raised me and the other children.

My country, Zimbabwe, was starving and there was not enough to eat.

we were hungry.

At that time, a girl in a blue uniform came to my village with the United Nations to feed the children.

When she handed me the porridge and asked me why I was there, she said without hesitation: “As Africans, we must lift the spirits of all Africans.”

I had no idea what she was saying.

(Laughs) But her words stuck in my mind.

Two years later, a second famine hit my country.

My grandmother had no choice but to send me to the city to live with an aunt I had never met.

So, when I was ten, I went to school for the first time.

And in an urban school, I got to experience what inequality is.

As you know, in the village we were all equal.

But in the eyes and minds of other children, I was no equal to them.

I couldn't speak English, and my reading and writing were quite delayed.

But this sense of inequality will be further complicated.

Every time I spent my school holidays in the village with my grandmother, I consciously realized that this great opportunity was creating inequality within my own family.

Suddenly I had much more than the rest of the village.

And in their eyes I was no longer their equal.

I felt guilty.

But I remember the girl in the blue uniform and I remember thinking, 'I want to be like her, someone who can inspire others.

This childhood experience led me to the United Nations and to my current role at UN Women. It tackles one of the greatest inequalities affecting more than half of the world's population: women and girls.

Today I would like to share a simple idea that will lift us all together.

Eight months ago, under the visionary leadership of UN Women President Pumjile Mlambo-Ngcuka, we launched a groundbreaking initiative called HeForShe, calling on men and boys around the world to join forces with each other and with women to create a shared vision for gender equality.

This is an invitation to those who believe in equality between women and men, and those who don't yet know what they believe.

This effort is based on the simple idea that what we share is far more powerful than what divides us.

we all feel the same.

We all want the same thing, even if it remains unspoken.

HeForShe aims to uplift us all together, women and men alike.

It is moving us towards the tipping point of gender equality.

Imagine a blank page with a single horizontal line splitting it in half.

Imagine that women are represented here and men are represented here.

HeForShe aims to make gender equality a reality in the 21st century by helping 3.2 billion men in our current population cross that line one at a time, ultimately allowing men to stand alongside women on the right side of history.

However, including men in the movement would be highly controversial.

Why are you inviting men? They are the problem.

(Laughter.) Actually, we were told that men don't care.

But when we launched HeForShe, something incredible happened.

In just three days, more than 100,000 men signed it, pledging to become agents of change for equality.

Within that first week, every country in the world had at least one man standing up to be counted, and within the same week, HeForShe generated over 1.2 billion conversations on social media.

Around that time, the emails began flooding in, sometimes reaching 1,000 a day.

We spoke with a Zimbabwean man who heard about HeForShe and founded a "husband's school."

(Laughter.) He literally walked around the village picking out all the men who were violent towards their partners and trying to turn them into better husbands and fathers.

In Pune, India, youth advocates organized an innovative bike rally, mobilizing 700 cyclists to share the HeForShe message within their communities.

In another shocking story, a man sent a very personal note about what happened in his community.

He wrote, "Dear Madam, I have lived all my life next to a man who beats his wife.

Two weeks ago I was listening to the radio and your voice came over talking about something called HeForShe and the need for men to fill that role.

Within hours, I heard another woman crying next to me, but for the first time I wasn't just sitting there.

I felt I had to do something so I went to my husband and confronted him.

Ma'am, it's been two weeks and she hasn't cried once since.

Thank you for calling me. ”

(Applause.) Stories that have impacted individuals like this show that we tap into something in men, but achieving a world where women and men are equal is more than just getting men into the cause.

We want concrete, systemic structural change that can equalize the political, economic and social realities of women and men.

We are asking men to take concrete action, intervene at the individual level and change their behaviour.

We are calling on governments, businesses and universities to change their policies.

We want our male leaders to be role models and change agents within their own organizations.

Already, many prominent men and leaders are taking action and making concrete commitments to HeForShe.

In some early success stories, French hospitality giant Accor has committed to closing the pay gap for all 180,000 employees by 2020.

(Applause.) The Swedish government under the current feminist government has committed to closing the employment and wage gaps for all its citizens within the current election period.

In Japan, Nagoya University is building a facility that will become one of Japan's leading gender research centers as part of its HeForShe initiative.

Now, eight months later, the movement is building.

From UN Secretary-General Ban Ki-moon to NATO Secretary-General and EU Council Secretary-General, from the Prime Minister of Bhutan to the President of Sierra Leone, we see men from all walks of life and from all corners of the world signing.

In Europe alone, all male EU members and parliamentarians from the Swedish and Icelandic governments are registered with HeForShe.

In fact, 1 in 20 men in Iceland participate in the movement.

Our passionate goodwill ambassador, Emma Watson, has reached over 5 billion media outlets, mobilized hundreds and thousands of students around the world, and established over 100 HeForShe student organizations.

This is the beginning of the vision HeForShe has for the world we want to see.

Einstein once said, "Man is part of the whole...

But he experiences himself, his thoughts, his feelings as cut off from the rest...

This delusion is a kind of prison for us...

Our mission must be to free ourselves from this prison by expanding our circle of compassion. ”

If, as Einstein suggests, women and men are part of a larger whole, I hope HeForShe will help us liberate ourselves to recognize that it is ultimately our shared humanity that defines us, not our gender.

HeForShe harnesses the dreams of women and men, the dreams we have for ourselves, and the dreams we have for our families, children, friends and community.

That's it.

HeForShe is meant to lift us all together.

thank you.

(applause)

You've been studying for weeks for an important test.

On the big day, you wait nervously for your teacher to hand it over.

As you work, you will be asked to define "Ataraxia." I'm sure you've seen it before, but your mind goes blank.

what happened now?

The answer lies in the complex relationship between stress and memory.

There are different types and degrees of stress and different types of memory, but here we focus on how short-term stress affects factual memory.

First, it helps to understand how this kind of memory works.

Facts read, heard, and studied become memorized through a process of three main steps.

The first is acquisition. In other words, it is the moment when you come across new information.

Each sensory experience activates a unique brain area.

To be a permanent memory, these sensory experiences must be consolidated by the hippocampus, which is influenced by the amygdala, which highlights experiences associated with strong emotions.

The hippocampus then encodes memories, presumably by reinforcing synaptic connections that were stimulated during the original sensory experience.

Once a memory is encoded, it can be recalled or retrieved later.

Memories are stored throughout the brain, and the prefrontal cortex probably sends the signals to recall them.

So how does stress affect each of these stages?

In the first two stages, a moderate amount of stress actually helps cement the experience into memory.

The brain responds to stress stimuli by releasing hormones known as corticosteroids, which activate the threat detection and threat response processes in the amygdala.

The amygdala prompts the hippocampus to integrate stress-causing experiences into memory.

On the other hand, stress-induced corticosteroid floods stimulate the hippocampus, which also promotes memory consolidation.

But while some stress can help, extreme, chronic stress can backfire.

The researchers tested this by directly injecting rats with stress hormones.

Gradually increasing corticosteroid doses initially increased memory test performance in rats, but decreased as the dose increased.

Similar positive effects are seen in humans with moderate stress.

However, it only appears when stress is associated with memory challenges. I mean, time pressure might help you memorize the list, but scaring your friends won't.

Also, corticosteroids sustained for weeks, months, or even years due to chronic stress can damage the hippocampus and impair its ability to form new memories.

It would be nice if some stress helped us remember the facts, but unfortunately the opposite is true.

The act of remembering relies on the prefrontal cortex, which is responsible for thinking, attention, and reasoning.

When corticosteroids stimulate the amygdala, it inhibits or reduces activity in the prefrontal cortex.

The reason for this inhibition is to allow the fight/flight/freeze response to overrule slower, more rational thinking in dangerous situations.

However, it can also lead to the unfortunate result of going blank during testing.

And the very act of remembering can be a stressor, leading to a vicious cycle of more corticosteroid release and even less recall.

So how can you use stress to your advantage and keep your cool when it matters most?

First, if you know that a stressful situation, such as a test, is coming up, try to prepare in a situation similar to the stressful environment.

Novelty can be a stress factor.

Being pressed for time to complete the exercises or sitting at your desk instead of your couch may dampen your stress response to these situations during the test.

Exercise is also a useful tool.

Increased heart and breathing rates are associated with chemical changes in the brain that reduce anxiety and increase feelings of well-being.

Regular exercise is also widely believed to improve sleep patterns and can be helpful the night before a test.

And on the day of the actual test, try taking deep breaths to counteract your body's flight/fight/freeze response.

Deep breathing exercises have been shown to visibly reduce test anxiety in a group ranging from third graders to nursing students.

So the next time your mind goes blank at a critical moment, take a few deep breaths until you remember Ataraxia, a state of calm free from anxiety.

So when I was a kid, I always spent time at my great-grandmother's house.

On a hot summer day, I dashed across the floor and poked my face in front of her only air conditioner.

But I didn't realize that that simple experience, albeit brief, would be a privileged one in our community.

As an adult, stories of neighbors having to set up fake energy accounts or stealing energy seemed normal to me.

Neighbors struggling to keep warm during the winter had no choice but to bypass the meters after turning off the heating, just to keep their families comfortable for another day.

Such dangerous incidents can occur when people are faced with impossible choices.

In the US, the average American spends 3% of their income on energy.

In contrast, low-income and rural people may spend 20 percent, or even 30 percent, of their income on energy.

In 2015, this caused more than 25 million people to skip meals to power their homes.

At this time, energy becomes a burden.

But energy load is more than just a number.

They make impossible and dangerous choices. Do you take your child to get flu medicine or feed him?

Or warm her up?

It's an impossible choice, and nearly every month, 7 million people choose between medicine and energy.

This reveals a much larger systemic problem.

Families with high energy loads are disproportionately comprised of people of color and spend more per square foot than white families.

Yet 37 million people a year cannot afford the energy to meet their most basic needs: nurses, veterans and even school teachers.

As a result, people with high energy loads are more likely to develop diseases such as heart disease and asthma.

Look, given a rocket to Mars and pocket-sized AI, we have the tools to address these systemic inequalities.

That technology is here.

The costs of renewable energy, insulation, microgrids and smart home technology are all falling.

But even though the costs are approaching parity, the majority of those who own solar power earn significantly more than the average American.

This is why I founded RETI, a non-profit organization, when I was 22.

Our mission is to work with communities, utilities and governments alike to reduce our energy burden by providing equitable access to clean energy, energy efficiency and energy technologies.

But there is no one way to solve this.

I believe in the power of local communities and their transformative effect.

So we start by working directly with the communities with the highest energy load.

We hold workshops and events for communities to learn about energy poverty and how small home improvements, such as insulating windows and water heaters, can go a long way to maximize efficiency.

We spearhead community-led smart home research and installation programs to connect neighborhoods to community solar power and help families reduce utility bills.

We are working directly with elected officials to advocate for more equitable pricing, because if this vision of energy equity and resilience is to succeed, we need to work together sustainably.

Currently, the United States spends more than $3 billion a year on helping pay its energy bills.

And while these programs certainly help millions of people, they can only help a fraction of those who need help.

In fact, there is a $47 billion gap in household energy affordability that is not sustainable through support alone.

But building energy equity and resilience in communities can ensure fair and equitable access to clean, reliable and affordable energy.

Large-scale microgrid technology, clean technology and energy efficiency will dramatically improve public health.

It can also help those with high energy burdens reclaim 20 percent of their income, or 20 percent of income for those struggling to make ends meet.

This is life changing.

This is an opportunity for families to put the saved energy to good use for their future.

I remember my great-grandmother and her neighbors, the impossible choices they had to make, and the impact it had on our entire community.

But this is not just their problem.

Today, millions of people across the country face the same impossible choices.

We know that high energy loads are major barriers to overcome, but we have a way to overcome them through our relationships with communities and technology.

And if we can do that, we will all be more resilient.

thank you.

(applause)

What do you do when you have a headache?

you swallow aspirin.

But for this pill to reach the sore head, it first passes through the stomach, intestines, and various other organs.

Swallowing tablets is the most effective and painless way to get medications into your body.

The downside, however, is that swallowing the medicine dilutes it.

And this is a big problem, especially for people living with HIV.

If you take anti-HIV drugs, these drugs help reduce the virus in your blood and increase your CD4 cell count.

However, they are also notorious for their harmful side effects, which most often do. By the time it reaches the blood, or worse, it is diluted by the time it reaches the most critical site: the reservoir of the HIV virus.

The virus lies dormant in these areas of the body, such as the lymph nodes, nervous system, and lungs, and does not easily reach the blood of patients on consistent antiretroviral therapy.

But stopping treatment can wake up the virus and infect new cells in the blood.

Now, all of this is a major problem in treating HIV with current medications, which are lifelong treatments that patients must swallow.

One day I sat and thought. "Could it be possible to administer an anti-HIV drug directly to its reservoir site without the risk of diluting the drug?"

As a laser scientist, the answer was right in front of me. Lasers, of course.

If it can be used in dentistry, diabetic wound healing, or surgery, it can be used for any imaginable application, such as transporting drugs into cells.

In fact, we are now using laser pulses to create or drill very small holes that open and close almost instantly in HIV-infected cells to deliver drugs into them.

"Is there such a thing?" you may ask.

While an HIV-infected cell is bathed in a drug-laden liquid, a very powerful but very small laser beam is directed at the membrane of the cell.

The laser penetrates the cell, which engulfs the drug within microseconds.

Unnoticed, the resulting hole is quickly repaired.

We are currently testing this technology in test tubes and petri dishes, but our goal is to take this technology into the human body and apply it to the human body.

"Is there such a thing?" you may ask.

The answer is to use a device with three heads.

The first head, a laser, is used to incise the infected area.

Use the second head, which is a camera, to meander to the infection site.

Finally, a third head, a drug-dispersing sprinkler, is used to administer drugs directly to the site of infection, while lasers are used to pierce the cells.

Well, this may not seem like such a big deal right now.

But if the technology succeeds one day, it may be possible to completely eradicate HIV from the body.

yes. HIV treatment.

This is every HIV researcher's dream. In our case, it is laser treatment.

thank you.

(applause)

For over 100 years, telephone companies have provided wiretapping assistance to governments.

During this time, this assistance was mostly manual.

Monitoring was done manually and wires were connected manually.

The call was tape recorded.

But like many other industries, computing changed everything.

Telcos have built monitoring capabilities into the core of their networks.

To give you a little insight into this, our phones and the networks that carry them were originally wired for surveillance.

first of all.

This means that when you are on the phone with your spouse, children, co-workers, or doctor, someone may be listening.

Now suppose someone could be your own government. Surveillance systems can also be compromised by another government, foreign intelligence agency, hacker, criminal, stalker, or other person who infiltrates a telephone company's surveillance system.

But while telcos are building monitoring capabilities as a priority, Silicon Valley companies aren't.

And in recent years, Silicon Valley companies have built strong encryption technology into their communications products, making it extremely difficult to monitor.

For example, many of you have an iPhone, and if you use your iPhone to send a text message to someone else who has an iPhone, your text message cannot be easily intercepted.

And in fact, according to Apple, you can't even see the text messages themselves.

Similarly, when you use FaceTime to make voice or video calls with friends and loved ones, they cannot be easily eavesdropped.

And it's not just Apple.

WhatsApp, now owned by Facebook and used by hundreds of millions of people around the world, also has strong encryption technology built into its product. This means that people in the Global South can easily communicate their text messages to their often authoritarian governments without their text messages being eavesdropped.

So, one might imagine that after 100 years of being able to hear any phone call anywhere, anytime, government officials aren't too happy.

And indeed it is happening.

Government officials are very angry.

And they're not mad because these encryption tools are now available.

What angers them most is that tech companies have built encryption into their products and it's enabled by default.

The important part is the default part.

In short, tech companies have democratized cryptography.

That's why government officials like British Prime Minister David Cameron believe that all communications - emails, text messages and voice calls - should be available to the government, but encryption makes that difficult.

Now look, I very much sympathize with their point of view.

We live in dangerous times in a dangerous world and there are some really bad people out there.

I suspect that there are terrorists and other serious national security threats that we all want the FBI and NSA to monitor.

However, these monitoring capabilities come at a cost.

The reason is that there is no such thing as a terrorist's laptop or a drug dealer's cell phone.

We all use the same communication devices.

What this means is that if you can intercept a drug trafficker's call or a terrorist's call, you can intercept the rest.

And I think we really need to ask. Should 1 billion people in the world use eavesdropping devices?

Therefore, the surveillance system hacking scenario I described is not imaginary.

In 2009, the Chinese government compromised the surveillance systems Google and Microsoft built into their networks, which they use to respond to lawful surveillance requests from the police. The Chinese government was trying to figure out which of its agents the US government was monitoring.

Similarly, in 2004, someone compromised a surveillance system built into the network of Vodafone Greece, Greece's largest telecommunications company, and used its surveillance capabilities to wiretap the Greek prime minister and ministers.

The foreign governments and hackers who did it were never caught.

And in fact, this leads to the very problem of these monitoring functions, the backdoor.

When you build a backdoor into your communications network or technology, there is no way to control who gets through it.

There is no way to control whether it is used on your side or on the other side, whether it is used by the good guys or the bad guys.

That's why I think it's better to build a network that is as secure as possible.

Yes, this means that cryptography will make eavesdropping more difficult in the future.

This means it will be harder for the police to catch bad guys.

But the alternative would mean living in a world where anyone's calls and text messages could be monitored by criminals, stalkers, and foreign intelligence agencies.

And I don't want to live in that kind of world.

And now you probably already have the tools in your phone or in your pocket to thwart various government surveillance, but you may just not realize how powerful and secure those tools are, or how vulnerable the other methods you've been using to communicate really are.

So my message to you is: We should use these tools.

You need to ensure the security of your phone.

You need to protect your text messages.

I hope you will take advantage of these tools.

Please tell your loved ones and colleagues to use these encrypted communication tools.

Don't use it just because it's cheap and easy, use it because it's safe.

thank you.

(applause)

This is a 16th century painting by Lucas Cranach the Elder.

You can see the famous Fountain of Youth.

Drinking or bathing in its water will give you health and youth.

Every culture, every civilization has dreamed of finding eternal youth.

Some, like Alexander the Great and the explorer Ponce de Leon, spent much of their lives chasing the Fountain of Youth.

they didn't find it.

But what if there was something to it?

What if there is something in this Fountain of Youth?

I would like to share some absolutely amazing developments in aging research that could revolutionize how we think about aging and how we treat age-related diseases in the future.

It started with experiments that showed in a number of recent studies on growth that animals sharing a blood supply with young mice (old mice) can rejuvenate.

This is similar to the phenomenon seen in humans and Siamese twins, and may sound a little eerie.

But stem-cell researcher Tom Lund reported in 2007 that old muscles in mice could rejuvenate when exposed to young blood through the common circulation.

This was replicated years later by Amy Wagers at Harvard University, after whom others have shown that similar rejuvenating effects may also be observed in the pancreas, liver and heart.

But what excites me, and several other labs as well, is that this may apply to the brain as well.

So what we found was that older mice exposed to a younger environment in this model, called parabiosis, showed younger brains and better brain function.

Again, older mice that receive younger blood through shared circulation look younger and have younger brain functions.

That said, as we get older, we can focus on different aspects of human cognition. As you can see on this slide, you can focus on things like reasoning and verbal abilities.

And by the time you're 50 or 60 or so, these features are totally intact, and looking at the young audience here in this room, we're all still fine.

(Laughter) But it's terrifying to see how all these curves are heading south.

And as we age, we can develop diseases such as Alzheimer's disease.

We know that with age, the connections between neurons—the way they talk to each other, the synapses—start to deteriorate. Neurons die and the brain begins to shrink, increasing susceptibility to these neurodegenerative diseases.

One of the big problems we have is trying to understand how this really works at the very level of molecular mechanics, but the inability to study the living human brain in detail.

We can do all kinds of advanced tests, such as cognitive tests and imaging tests.

But usually you have to wait until the person is dead before you can take a brain to see how it's actually changed with age or disease.

This is what neuropathologists do, for example.

So why not think of the brain as part of a larger organism?

If we look at the brain as part of the body as a whole, could we possibly gain a better understanding of what's going on in the brain at the molecular level?

So, when the body ages or gets sick, does it affect the brain?

And vice versa. As the brain ages, does it affect other parts of the body?

Blood is what connects different tissues in the body.

Blood is a tissue that not only carries oxygen-carrying cells such as red blood cells and cells that fight infection, but also messenger molecules, hormone-like factors that carry information from one cell to another and from one tissue to another, including the brain.

So what can we learn about the brain by observing how blood changes with disease and aging?

These hormone-like factors also change with age, as we know that our blood changes as we age.

And in general, factors known to be necessary for tissue development and maintenance begin to decline with age, while those involved in repair, damage and inflammation increase with age.

In other words, the balance between good and bad elements is broken.

And to illustrate what you can do with it, I'd like to walk you through an experiment we did.

We took approximately 300 blood samples from healthy humans aged 20 to 89 and measured over 100 communication factors, hormone-like proteins that transfer information between tissues.

And the first thing we noticed was that about half of the factors changed significantly between the youngest and oldest groups.

Therefore, with respect to these factors, our bodies live in vastly different environments as we age.

And statistical and bioinformatics programs can be used to discover the factors that best predict age. In a way, you are working backwards on a person's relative age.

And this is shown in this graph.

In other words, one axis shows the actual age the person lived, or chronological age.

So how many years did they live?

And then take those key factors I gave and calculate their relative age, or biological age.

And we found a pretty good correlation, predicting a person's relative age fairly accurately.

But what's really interesting, as is often the case in life, are outliers.

As you can see here, the person I highlighted with the green dot is about 70 years old, but if what we're doing here is really true, his biological age appears to be only about 45.

So does this person actually look much younger than his age?

But more importantly, is this person likely to have a lower risk of developing age-related diseases and live longer, i.e., live to be 100 or older?

On the other hand, the person highlighted here with the red dot is not even 40, but has a biological age of 65.

Is this person at increased risk for developing age-related diseases?

So our lab is trying to better understand these factors, and many other groups are also trying to understand what the true aging factors are, and if we can learn something about them to predict age-related diseases.

So what you've shown so far is just correlation, right?

We can only say that "these factors change with age", but we don't really know if they have any effect on aging.

Therefore, what I am about to show is quite remarkable and suggests that these factors can indeed regulate tissue age.

So we come back to this model called parabiosis.

That is, mouse symbiosis was done by surgically connecting two mice, which led to a shared blood system, where one could ask, "How is the old brain affected by exposure to young blood?"

For this purpose, we use young mice that are 20 years old and old mice that are about 65 years old in human years.

What we discovered was quite amazing.

It turns out that these old brains have more neural stem cells that make new neurons.

Increased activity of synapses, the connections between neurons.

There are additional expressed genes known to be involved in the formation of new memories.

And less of this bad inflammation.

However, it was observed that the brains of these animals were empty of cells.

Therefore, in this model, when you connect them, the cells that enter the old brain are practically absent.

Instead, we reasoned that it must be a soluble factor, so we could simply collect the soluble part of the blood, called plasma, and inject either young or old plasma into these mice, recapitulating these rejuvenating effects. But what we can do now is that we can also use mice to do memory tests.

Just like us humans, mice experience memory loss as they age.

They're even harder to detect, but we'll show you how in a minute.

But we wanted to take this one step further and get one step closer to the human-relevant possibilities.

What I'm showing you now is an unpublished study that used human plasma, young human plasma, and saline as a control, and asked if we could inject it into old mice and rejuvenate these old mice.

Can we make them smarter?

To do this, I used a test. It's called a Barnes maze.

It's a big table with lots of holes, guide marks around it and bright lights like the stage here.

The rats don't like this and try to escape, but they find a hole marked by an arrow. Underneath it is attached a tube through which you can escape and get comfortable even in dark holes.

So we spend a few days teaching you to find this space based on these cues in space. In human terms, this is like finding your car in a parking lot after a busy day of shopping.

(Laughter) Many of us have probably had some trouble with that.

So let's take a look at the old mouse here.

As you can see right away, this is an old mouse with memory issues.

It's just looking through all the holes, but it didn't form a spatial map that reminded me of where I was the last time or the last day.

In stark contrast, this mouse, an age-matched sibling, was treated for 3 weeks with young human plasma with small injections every 3 days.

And, as you may have noticed, I tend to look around, "Where am I?" --Then, walk straight towards the hole and run away.

Then I could remember where that hole was.

So by all means this old mouse looks rejuvenated. Works like a younger mouse.

This also suggests that young mouse plasma, as well as young human plasma, has the ability to help this old brain.

In summary, we find that old mice, especially their brains, are adaptable.

they are not fixed. can actually be changed.

You can rejuvenate.

Young blood factor can reverse aging. And although I didn't show, in this model young mice actually suffer from exposure to old stuff.

This means that there is an old blood factor that accelerates aging.

And most importantly, it is possible that there is a similar factor in humans, as drawing blood from young humans produces similar effects.

I didn't show you, but old human blood has no such effect. It does not rejuvenate the mouse.

So, can this magic be transmitted to humans?

We are doing a small clinical study at Stanford University. There, patients with mild Alzheimer's disease are treated with a pint of plasma taken from a young 20-year-old volunteer once a week for four weeks, after which the brain is imaged.

We test their cognitive function and ask caregivers about activities of daily living.

Our hope is that this treatment will show signs of improvement.

If so, what I've shown works in mice might give hope that it might work in humans as well.

Well, I don't think we can live forever.

But perhaps we have just realized that the Fountain of Youth is actually within us and it has dried up.

And if we could undo it a little bit, perhaps we could find the factors that mediate these effects, and these factors could be produced synthetically, allowing us to treat aging diseases such as Alzheimer's and other dementias.

thank you very much.

(applause)

I would like to introduce you to an emerging area of ​​science that is very exciting and certainly growing very rapidly, although it is still speculative.

Quantum biology asks a very simple question. Does quantum mechanics, the strange, wonderfully powerful theory of the subatomic world of atoms and molecules that underpin much of modern physics and chemistry, also play a role inside living cells?

In other words, are there biological processes, mechanisms, or phenomena that cannot be explained without the help of quantum mechanics?

Well, quantum biology is nothing new. It has existed since the early 1930s.

However, it is only in the last decade or so that careful experiments in biochemical laboratories using spectroscopy have provided very clear and hard evidence that there are certain mechanisms that require quantum mechanics to explain them.

Quantum biology is a highly interdisciplinary field that brings together quantum physicists, biochemists, and molecular biologists.

I come from a quantum physics background, so I'm a nuclear physicist.

I have been trying to understand quantum mechanics for over 30 years.

Niels Bohr, one of the founders of quantum mechanics, said, "If quantum mechanics doesn't surprise you, you don't understand it."

So in a way I'm happy that I'm still amazed by it.

that's good

But that means I'm studying very small fabrics of the universe, the building blocks of reality.

When we think about the scale of size, we start with mundane objects like tennis balls, then go down in size by orders of magnitude, from the hole of a needle to cells, bacteria, enzymes, and finally to the nano world.

Now, you may have heard the term nanotechnology.

A nanometer is one billionth of a meter.

My field of expertise is atomic nuclei. A nucleus is a tiny dot within an atom.

Even smaller in scale.

This is the realm of quantum mechanics, and physicists and chemists have spent a long time getting used to it.

Biologists, on the other hand, are getting away with it, I think.

They are very happy with the ball-and-stick model of the molecule.

(Laughter) The balls are the atoms, the sticks are the bonds between atoms.

And even if you can't physically build them in the lab, today we have very powerful computers that simulate giant molecules.

This is a protein made up of 100,000 atoms.

It doesn't require much quantum mechanics to explain it.

Quantum mechanics was developed in the 1920s.

It is a beautiful and powerful set of mathematical rules and ideas that describe a very small world.

And it's a world very different from our everyday world of trillions of atoms.

It's a world built on chance and chance.

It's an ambiguous world.

It's an illusionary world where particles can also behave like spreading waves.

If we imagine quantum mechanics and quantum physics as the fundamental underpinnings of reality itself, it is no surprise that quantum physics underpins organic chemistry.

After all, we have the rules for how atoms combine to form organic molecules.

Organic chemistry adds complexity and brings us to molecular biology, which of course leads to life itself.

So in a way it's not surprising.

It's mostly trivial.

You say, "Of course life should ultimately depend on quantum mechanics."

But so are other things.

So are all inanimate objects, which are made up of trillions of atoms.

Ultimately there is a quantum level where this weirdness has to be delved into.

However, in our daily life, we sometimes forget it.

Because once you put the trillions of atoms together, the quantum weirdness melts away.

Quantum biology is not about this.

Quantum biology is less obvious.

Of course, quantum mechanics supports life at a certain molecular level.

Quantum biology is all about looking for the non-trivial, the counterintuitive ideas of quantum mechanics, and seeing if they actually play an important role in describing the processes of life.

This is a perfect example of the counterintuitiveness of the quantum world.

This is the quantum skier.

He is unharmed and appears perfectly healthy, nevertheless he seems to have gone around both sides of the tree at the same time.

Well, if you see a truck like that, you'd guess it's some kind of stunt, of course.

But in the quantum world, this happens all the time.

Particles can multitask and be in two places at the same time.

They can do multiple things at the same time.

Particles can behave like spreading waves.

It's almost magical.

Physicists and chemists have struggled for nearly a century to familiarize themselves with this strange phenomenon.

I don't blame biologists for not needing or wanting to learn quantum mechanics.

As you know, this strangeness is very delicate. And we physicists work hard to keep it that way in the lab.

We try to cool the system to near absolute zero, conduct our experiments in a vacuum, and isolate the system from outside disturbances.

It is very different from the warm, messy, noisy environment of a living cell.

If we think about molecular biology, biology itself seems to be very successful in explaining all the processes of life in terms of chemistry, that is, chemical reactions.

These are reductionist, deterministic chemical reactions that essentially show that life is made of the same thing as everything else, and if we can forget quantum mechanics in the macro world, we should be able to forget quantum mechanics in biology as well.

Now, one man challenged this idea.

Erwin Schrödinger, famous for Schrödinger's cat, was an Austrian physicist.

He was one of the founders of quantum mechanics in the 1920s.

In 1944 he wrote the book "What is Life?"

It had a huge impact.

Inspired Francis Crick and James Watson, discoverers of the double helix structure of DNA.

Paraphrasing his description of the book, he says: At the molecular level, living things have a certain degree of order, and their structures are very different from the random, thermodynamic swarms of inanimate atoms and molecules of the same complexity.

In fact, living matter seems to behave in the same order as inanimate objects cooled to near absolute zero, in which quantum effects play a very important role.

There is something special about the internal structure, or order, of living cells.

So Schrödinger speculated that quantum mechanics probably played a role in life.

It's a very speculative and far-reaching idea, but it didn't really pay off that much.

However, as I mentioned at the beginning, in the last decade there have been experiments that show that some specific phenomena in biology appear to require quantum mechanics.

I would like to introduce some interesting ones.

This is one of the most well-known phenomena in the quantum world: quantum tunneling.

The box on the left shows the quantum entity, a wavy distribution of electron-like particles rather than tiny balls bouncing off walls.

It's a wave that breaks through a strong wall with a certain probability, and it's like an illusion jumping to the other side.

A faint light smudge can be seen on the box on the right.

Quantum tunneling suggests that even if a particle hits an impenetrable barrier, it can somehow magically disappear from one and reappear on the other.

The easiest way to explain this is that if you want to throw a ball over a wall, you have to give it enough energy to go over the top of the wall.

In the quantum world, you don't have to throw across walls, you can throw against walls. With some non-zero probability, it will disappear on this side and reappear on the other side.

By the way, this is not speculation.

We're happy -- well, "happy" isn't the right word -- (Laughter) We know this all too well.

(Laughter) Quantum tunneling is happening all the time. In fact, that's why our sun shines.

The particles fuse together and the sun turns hydrogen into helium through quantum tunneling.

In the 70's and 80's it was discovered that quantum tunneling also occurs in living cells.

Enzymes, Workhorses of Life, Catalysts of Chemical Reactions -- Enzymes are biomolecules that speed up chemical reactions in living cells by orders of magnitude.

And how they do this has always been a mystery.

Well, it was discovered that one of the tricks that enzymes have evolved to exploit is to move elementary particles, such as electrons, or actually protons, from one part of a molecule to another via quantum tunneling.

It's efficient, fast, and disappearable. A proton can disappear from one place and reappear in another.

Enzymes help with this.

This is research carried out in the 80's, especially by the Berkeley group, Judith Klinman.

Other groups in the UK have also confirmed that the enzyme does indeed do this.

Work done by my group -- As I said, I'm a nuclear physicist, and I've found that I have the tools to use quantum mechanics with atomic nuclei. This means that these tools can be applied to other areas as well.

One of the questions we asked is whether quantum tunneling is involved in DNA mutations.

Again, this is not a new idea. It dates back to the early 60's.

Two DNA strands, a double helix structure, are held together by a crossbar. It's like a twisted ladder.

And the rungs of the ladder are hydrogen bonds, or protons, which act as the glue between the two chains.

So if you zoom in, you can see that they hold these large molecules, or nucleotides, together.

Zoom in a little more.

So this is a computer simulation.

You can see that the two white spheres in the middle are protons and hydrogen double bonds.

People prefer to sit on one side. The other is on the other side of the two vertical lines that extend down, but is not visible.

It can happen that these two protons jump over.

Notice the two white balls.

They can jump over to the other side.

Mutations can then occur when the two DNA strands are then separated and the replication process occurs, placing the two protons in the wrong position.

This has been known for half a century.

The question is how likely are they to do so, and if so, how do they do it?

Like a ball over a wall, do you want to jump over it?

Or can we go through the quantum tunnel even if we don't have enough energy?

Early indications suggest that quantum tunneling could play a role here.

I don't know yet how important it is. This is still an open question.

This is speculative, but it is one of the most important questions, so if quantum mechanics is involved in mutations, it must certainly have great implications for understanding certain types of mutations, possibly those that lead to cancerous cells.

Another example of quantum mechanics in biology is quantum coherence in one of the most important processes in biology, photosynthesis. Plants and bacteria receive sunlight and use the energy to produce biomass.

Quantum coherence is the concept that quantum entities perform multitasking.

Quantum skier.

It's an object that behaves like a wave, moving in one direction or the other, as well as following multiple paths at the same time.

A few years ago, the scientific world was shocked when a paper was published showing experimental evidence that quantum coherence occurs in bacteria to drive photosynthesis.

The idea is that light particles, sunlight, and quanta of light captured by chlorophyll molecules can be sent to what are called reaction centers, where they can be converted into chemical energy.

And it's not just one route to get there. Multiple paths are followed simultaneously to optimize the most efficient way to reach the reaction center without being dissipated as waste heat.

Quantum coherence that occurs in living cells.

It's an amazing idea, but the evidence is mounting every week, with new papers coming out confirming that this is indeed happening.

The third and final example is the most beautiful and brilliant idea.

This is still very much speculation, but I have to share with you.

European robins migrate from Scandinavia to the Mediterranean Sea each autumn, and like many other marine animals and insects, they migrate by sensing the Earth's magnetic field.

Well, the Earth's magnetic field is very, very weak. It's 100 times weaker than a refrigerator magnet, but it still somehow affects the chemistry in living organisms.

There is no doubt about it. In the 1970s, German ornithologists Wolfgang and Roswita Wilczyko confirmed that robins do indeed find their way by somehow sensing the Earth's magnetic field and giving them directional information. Built-in compass.

The puzzle, the riddle was "How can we do that?"

Well, the only theory out there, I don't know if it's the right theory, is that it's done via something called quantum entanglement.

Inside the robin's retina, no kidding, inside the robin's retina is a protein called cryptochrome that is sensitive to light.

Within cryptochrome, a pair of electrons are quantum entangled.

Now, quantum entanglement is when two particles are separated by a great distance but still somehow remain in contact with each other.

Even Einstein hated this idea. He called it "creepy action seen from afar".

(Laughter.) I mean, if Einstein didn't like it, we could all find it offensive.

Two entangled electrons within a single molecule perform a delicate dance that is highly sensitive to the direction in which a bird flies within the Earth's magnetic field.

I don't know if that's the correct explanation, but wouldn't it be very exciting if quantum mechanics could help birds navigate?

Quantum biology is still in its infancy.

It's still in the speculation stage.

But I believe it is built on solid science.

I also think that in the next decade or so, we'll start to see that it's actually permeating life, that life has evolved tricks to harness the quantum world.

Check out this space.

thank you.

(applause)

Symptoms in children begin with mild fever, headache, and muscle aches, followed by vomiting, diarrhea, and bleeding from the mouth, nose, and gums.

Death occurs in the form of organ failure due to hypotension.

Sound familiar?

For those of you who think this is Ebola, it's actually not in this case.

This extreme form of dengue, a mosquito-borne disease, also has no effective treatment or vaccine and kills 22,000 people each year.

This is twice the actual number of people who have died from Ebola in the nearly 40 years we know about it.

Measles is in the news a lot these days, but the actual number of deaths is ten times higher.

But over the past year, it has been Ebola that has stolen all the headlines and scare.

Clearly, there is something deeply rooted in this disease, something that scares and fascinates us more than other diseases.

But what exactly is it?

Ebola is hard to catch, but if you do get it, the risk of a horrific death is high.

why?

This is because there is currently no effective treatment or vaccine.

So that's the clue.

I might get it someday.

So it's no surprise that we fear Ebola. Because Ebola doesn't kill as many people as other diseases.

In fact, it is much less infectious than viruses such as influenza and measles.

We fear Ebola because of the fact that it kills us and cannot be cured.

We fear the inevitability of Ebola.

Ebola hemorrhagic fever has an inevitability that defies modern medicine.

But wait, why is that?

We have known about Ebola since 1976.

We know what it enables.

In the 24 outbreaks that have occurred so far, we have had ample opportunity to study it.

And indeed, vaccine candidates have been available for more than a decade.

Why are these vaccines only now entering clinical trials?

This concerns a fundamental problem with vaccine development for infectious diseases.

It looks like this: The people most at risk for these diseases are also the people least able to pay for vaccines.

That leaves little market incentive for manufacturers to develop vaccines, unless there are large numbers of people at risk in wealthy countries.

It's just too risky commercially.

As for Ebola, there is no market at all, so the only reason there are currently two vaccines in late-stage clinical trials is actually somewhat misguided fear.

Ebola was relatively neglected until September 11th and the anthrax attacks, when suddenly people realized it was a potential bioterrorist weapon.

Why wasn't an Ebola vaccine fully developed at this point?

This was partly because it was, or seemed to be, very difficult to weaponize the virus, but mainly because of the economic risks in developing the virus.

And this is the really important point.

The sad reality is that we don't develop vaccines based on the risk that pathogens pose to people, but rather how risky it is financially to develop them.

Vaccine development is expensive and complex.

Transforming even a well-known antigen into a viable vaccine can cost hundreds of millions of dollars.

Fortunately, there are things we can do to remove some of these barriers when it comes to diseases like Ebola.

The first is recognizing when the market has completely failed.

So if we want a vaccine, we have to provide an incentive or some kind of subsidy.

We also need to do a better job of figuring out which diseases threaten us the most.

Creating capacities within countries will enable those countries to build epidemiological and laboratory networks that can collect and classify these pathogens.

The resulting data can be used to understand geographic and genetic diversity, helping us understand how they are changing immunologically and what types of responses they drive.

That's all we can do, but if we want to deal with total market failure, we need to change the way we look at and prevent infectious diseases.

We must stop waiting for evidence that a disease becomes a global threat before considering it a global threat.

As for Ebola, the paranoid fear of the epidemic and the ensuing transfer of a small number of infected people to wealthy countries has rallied the international community, and the work of the vaccine companies has made these things available today. Two Ebola vaccines in efficacy trials in Ebola countries -- (applause) and the pipeline of vaccines that follow.

We spend billions of dollars each year to permanently patrol the oceans with fleets of nuclear submarines to protect us from threats that are almost certainly not possible.

Yet we spend virtually nothing to prevent something as concrete and evolutionarily certain as an epidemic.

Don't get me wrong. This is a question of "when", not "if".

These bugs will continue to evolve and threaten the world.

And vaccines are our greatest defense.

So if we want to prevent an epidemic like Ebola, we have to take the risk of investing in vaccine development and building stockpiles.

And we should see this as the ultimate deterrent. It's something that will make sure it's available, but at the same time we're praying that we won't have to use it.

thank you.

(applause)

More than one million people die in disasters each year.

2.5 million people will be permanently disabled or displaced, communities will take 20 to 30 years to recover, and billions of dollars in economic losses will be incurred.

One day less initial response saves 1,000 days, or three years, of overall recovery time.

Do you know how it works?

If first responders can come in and save lives and mitigate any flood hazards, then other groups can come in and restore water, roads, and electricity, which means construction workers, insurance agents, everyone can come in and rebuild homes, which can restore the economy and perhaps even make it more resilient to the next disaster.

A major insurance company told me that if I could get a homeowner's claim processed a day sooner, it would save me six months from fixing his home.

That's why I'm working on disaster robotics. Because robots can solve disasters faster.

Well, we've already seen some of these.

These are UAVs.

These are two types of UAVs. One is the rotorcraft, or hummingbird. Fixed wing, falcon.

And they have been used extensively since Hurricane Katrina in 2005.

Let me show you how this hummingbird, this rotorcraft, works.

Great for structural engineers.

You can see the damage from angles you can't get with binoculars or satellite imagery on the ground, or anything that flies at a higher angle.

But it's not just structural engineers and insurance people who need it.

There are things like this fixed wing, this falcon.

This hawk can now be used for geospatial surveys.

Here the images are put together for 3D reconstruction.

The Oso mudslide in Washington used both. The big problem was not search and rescue, but geospatial and hydrological understanding of the disaster.

The search and rescue team had it under control and knew what they were doing.

A bigger problem was that rivers and landslides could wipe them out and flood the response forces.

And it's been difficult for responders, causing property damage and jeopardizing the future of salmon fishing in that area of ​​Washington.

Therefore, they had to understand what was happening.

It takes seven hours to depart from Arlington, drive from the accident command post to the scene, fly the UAV, process the data, and return to Arlington command post.

It provided data in 7 hours and at a higher resolution than would otherwise take 2-3 days.

It's a game changer.

Don't just think about UAVs.

I mean, it's sexy, but remember, 80 percent of the world's population lives by water, which means our critical infrastructure is underwater. That is, parts that we cannot reach, such as bridges.

And that's why we have unmanned marine vehicles. One of the types you already know is the SARbot, the square dolphin.

Dive underwater and use sonar.

So why are marine vehicles so important, and why are they so important?

they are ignored.

Consider the Japanese tsunami. 400 miles of coastline were completely destroyed. That's twice as much coastal land as was destroyed by Hurricane Katrina in the United States.

What you are talking about is the annihilation of bridges, pipelines and ports.

And without ports, there is no way to get enough relief supplies to support the population.

The Haiti earthquake was a big problem.

Therefore, a marine vehicle is required.

Now let's see their point of view from SARbot's point of view.

We were working on a fishing port.

Using her sonar, we were able to reopen the fishing port in four hours.

The port said it would take six months for the manual diver team to arrive and two weeks for the divers to arrive.

They miss the fall fishing season, which is a major economy in areas like Cape Cod.

UMV, very important.

But as you know, all the robots I've shown you so far have been small. Because robots don't do the same things humans do.

They go where people can't go.

Bujold is a good example.

Unmanned ground vehicles are particularly small, so say hello to Bujold -- (laughter) Bujold.

(laughter) Bujold was used extensively to pass Towers 1, 2 and 4 at the World Trade Center.

Climb and rappel through rubble as you travel deep into space.

Let's look at the World Trade Center from Bujold's perspective. Look at this.

You're talking about a disaster that people and dogs can't get into, and it's on fire.

The only hope of reaching the survivors in the basement must be through what's on fire.

It was so hot that the tracks on one of the robots began to melt away.

Robots will not replace humans, dogs, hummingbirds, hawks or dolphins.

they do new things.

They assist responders, professionals, in new and innovative ways.

But the biggest problem is that the robot cannot be made smaller.

It does not increase heat resistance.

It doesn't add more sensors.

The biggest problem is data, informatics. Because these people need to get the right data at the right time.

So wouldn't it be great if the robot could be accessed instantly and used by anyone there via the internet, without the experts wasting time driving to the site?

Well, let's think about it.

Consider a chemical train derailment in a rural county.

What are the chances that an expert, a chemical engineer, a railroad transportation engineer is trained on a UAV that happens to be in that county?

Probably nothing.

So we use interfaces like this to let people use robots without knowing which robot they're using or if they're using a robot.

What robots give you, and experts, is data.

The question is who gets what data and when.

One thing to do is send all the information to everyone and have them sort it out.

Well, the problem is overwhelming the network, and worse, overwhelming the cognitive abilities of each person trying to get the information they need to make the decisions that make the difference.

Therefore, we need to think about such challenges.

So it's data.

Coming back to the World Trade Center, we tried to solve the problem by recording data from Bujold only when he was deep in the rubble. Because that was what the USAR team wanted.

What we didn't know at the time was that the civil engineers would have needed the data when recording box beams, serial numbers and positions as they entered the rubble.

I lost my precious data.

So the challenge is getting all the data and getting it to the right people.

Well, there's another reason.

Some buildings, such as schools, hospitals and city halls, were found to have been inspected four times by different agencies throughout the response phase.

Now, if we can get the data to share from the robot, we'll be able to do things like compress the sequence of phases to reduce response time, but also allow responses to run in parallel.

Anyone can see the data.

You can shorten it like this:

So, in fact, the term “disaster robot” is a misnomer.

It's not about robots.

It's about data.

(Applause) So here's my challenge to you. Next time you hear about disaster, look for robots.

They may be underground, they may be in the water, they may be in the air, but they must be there.

Robots are coming to help, so look for them.

(applause)

I was raised lesbian in the mountains and came to New York like a gnome in the woods not too long ago.

(Laughs) It was really confusing, but we'll get to that later.

Start when you are 8 years old.

In Colorado, I picked up a crate and filled it with dollar bills, pens, and forks.

And I thought 500 years from now some weird humanoid or alien would find this box and learn how our species communicated, perhaps how we ate spaghetti.

I really didn't know.

Anyway, this is kind of funny. After 30 years, I'm still making boxes.

Well, at one point I was in Hawaii and I liked doing weird things like hiking and surfing and I was making a collage for my mom.

And I took out a dictionary, tore it up, made something like Agnes Martin's grid, poured resin over it, and the bees got stuck.

Now she is afraid of bees and is allergic to them, so she thought of something to hide it and poured more resin on the canvas.

Instead, the opposite happened. In other words, a magnifying glass-like magnification was created for the text in the dictionary.

So what did I do? I made another box.

This time, I started putting electronics, frogs, weird bottles I found around town, whatever I could find. Because all my life I was always trying to find something to make a relationship between those objects and tell a story.

When I started drawing around objects, I realized that I could also draw in space.

You can draw free-floating lines like you would draw around a corpse at a crime scene.

So I took the object out and created my own taxonomy of invented specimens.

First, it is botanical. I think you can understand this somehow.

Then I made some strange insects and creatures.

It was really fun; I was just painting on a layer of resin.

that was cool. I started doing shows and things like that and I was making money so I could take my girlfriend out to dinner and go to Sizzler.

That was good shit, dude.

(Laughter) At some point, I got to the human form, a life-size resin sculpture of a human being in layers.

This was great, except for one thing: I was going to die.

The resin nearly killed me and I didn't know what to do.

And I fell asleep thinking about it every night.

I tried using glass.

I started painting on layers of glass. It was like painting a window, then putting another window, then another window, and all these windows together creating a three-dimensional composition.

And this really worked because we were able to stop using resin.

So I did this over the years, and it turned out to be a very large piece that I call a triptych.

The Triptych is primarily inspired by Hieronymus Bosch's painting The Garden of Earthly Delights in the Prado Museum in Spain.

Do you know this picture?

Nice, nice picture.

It's ahead of its time, they say.

Well, "Triple Altarpiece". I will explain this part.

It weighs 24,000 pounds.

It is 18 feet long.

It's double sided so it's a 36 foot configuration.

It's kind of weird.

That's the blood fountain.

(Laughter) On the left is Jesus and the locust.

There is a cave where animal-headed creatures travel between two worlds.

They go from the world of expression to this analogue mesh underworld where they hide.

Here, by the lighthouse, there are animal-headed creatures, and they're all heading out to sea to commit mass suicide.

The ocean is made up of thousands of elements.

This is a bird god tied to a battleship.

(Laughter) Billy Graham is in the ocean. Horizon due to oil spill. Waldo. Osama Bin Laden's Sanctuary -- In the ocean, you can find all sorts of strange things if you look hard enough.

Anyway, this is a female creature.

She comes out of the sea, vomits oil in one hand, and clouds in the other.

Her hands are like scales, balancing the mythical earth and the universe.

This is one side of the "triptych".

It's a little narrative story.

That's the hand she's spitting on.

And if you go to the other side, she's got something like a bird's beak-like trunk, and she's spitting clouds out of the trunk.

And she has an 18-foot-long snake tail that connects with the "triptych."

Anyway, her tail flares up from the back side of the volcano.

(Laughter) I don't know why that happened.

(Laughter) That kind of thing happens.

Her tail ends with a cyptic eyeball made from a 1986 terrorist card.

Have you seen them?

Made in the 1980s, it's like a terrorist baseball card.

Far ahead of its time.

(laughter) So let me introduce you to my latest project.

I'm in the middle of two projects. One is called "psychogeography".

It's a project that takes about six years to make 100 of these humans.

Whether encyclopedias, dictionaries, or magazines, each is an archive of our culture through the media and materials we carve out.

But each acts as a sort of archive in human form, traveling in groups of 20, 4, or 12 at a time.

They are like cells. Assemble or split up.

And you kind of walk through them. It takes years.

Each is essentially a 3,000-pound microscope slide with a human trapped inside.

This child has a small hole in his chest.

it's his head. The chest is there and you can see the beginning.

A waterfall flows from his chest, covering his penis—or no penis, or whatever it is—some kind of androgynous.

I can't describe them too long, so I'll briefly describe these works.

You can see that there are layers.

That is, the body splits in two.

It has two heads and communicates between them.

A pill is seen coming out of this strange statue and entering one of its heads.

There is a small forest scene in the chest cavity.

can you see it?

Anyway, this story is all about these boxes, like the boxes we're in.

This box we are in, the solar system is also a box.

This brings me to my latest box.

It's a brick box. It's called Pioneer Works.

(Cheers) Inside this box are physicists, neuroscientists, painters, musicians, writers, radio stations, museums, schools, and a publishing department to spread all the content we create there. garden.

Shake this box and all the people start hitting each other like particles.

I think that's the way to change the world.

Redefine yourself inside and the box you live in.

And we are all united to understand that we are all working together on this issue, that this delusion of difference, this idea of ​​nations, borders, religions, does not work.

We are all made up of the same things in the same box.

And if we don't start exchanging such things kindly and nicely, we're all going to die soon.

thank you very much.

(applause)

It was an incredible surprise for me to learn that there actually is an organization that cares about both parts of my life.

Because basically I work as a theoretical physicist.

I'm developing and testing a model of the Big Bang using observational data.

And I've been helping out on projects in Africa for the last five years.

And Cambridge has received a lot of criticism for this.

People will wonder, "How do you have time to do that?" and so on.

So it was simply a surprise to me to find an organization that actually evaluates both aspects of it.

So I thought I'd start by telling you a little bit about myself and why I live this schizophrenic life.

I was born in South Africa and my parents were imprisoned for resisting a racist regime.

When they were released we left there and went to Kenya and Tanzania as refugees.

At that time, both were very young countries and full of hope for the future.

We had a wonderful childhood. We had no money, but were outdoors most of the time.

We have been blessed with great friends and have seen wonders of the world such as Kilimanjaro, Serengeti and Olduvai Gorge.

So we moved to London for high school.

After that, I have nothing more to say about it.

It was pretty boring. But when I was 17, I returned to Africa as a volunteer teacher in Lesotho, a small country then surrounded by apartheid South Africa.

Eighty percent of Lesotho men worked in harsh conditions in cross-border mines.

Nevertheless, I was—certainly—received with incredible hospitality and warmth as a rather annoyed young white man who had come to their village.

But the best part was the children.

The children were wonderful, very enthusiastic and often very bright.

And I would like to tell you just one story that was passed down to me.

I took my kids outside as often as possible to connect school with the real world.

And they weren't used to it.

But one day, I took them outside and asked them to measure the height of the building.

And I expected them to put a ruler next to the wall, measure it with their fingers, and estimate the height.

But there was one boy there who was very small for his age.

He was the son of the poorest family in the village.

And he wasn't doing that. He was writing chalk on the pavement.

So I said--annoyed--"What are you doing?

I would like you to estimate the height of the building. ”

He said, "Okay, I measured the height of the bricks.

I counted the number of bricks and now I am increasing it. ”

Well -- (laughter) -- I didn't think of that.

And this kind of experience happened to me a lot.

Another thing is that I met a miner. He was returning home after a three-month vacation from the mines.

One day, as I sat next to him, he said, "There was only one thing I really loved at school.

do you know what it was? Shakespeare,” and he read a few to me.

And these and many similar experiences have convinced me that there are many bright children in Africa -- inventive children, intelligent children -- who are hungry for opportunity.

And if Africa is going to solve it, it will be solved by them, not us.

Well, then -- (applause) -- that's the truth.

Well, after Lesotho I traveled through Africa before returning to England and it was so gray and depressing by comparison.

and went to Cambridge. It was there that I fell in love with theoretical physics.

I'm not going to explain this equation, but theoretical physics is a really cool subject.

All the laws of physics we know can be written down in one line.

And yes, it's a very shorthand notation.

It contains 18 free parameters and should be fitted to your data.

So this is not the final story, but a very powerful summary of everything we know about nature at its most basic level.

And, apart from a few very important open questions that we've heard about here (like dark energy and dark matter), this equation seems to explain everything about the universe and what's in it.

But one big puzzle remains. This was most succinctly taught by a Tanzanian primary school mathematics teacher. She is a wonderful Scottish lady and we still keep in touch.

And she's in her eighties now.

And when I tried to explain her job to her, she ignored all the details and said, 'Neil, there's only one really important question.

what exploded? (laughs) "Everyone talks about the Big Bang. What happened?"

and she is right. That's the question we've all been avoiding.

The standard explanation is that the universe was somehow born full of a strange kind of energy, inflationary energy, which blew the universe away.

However, the mystery of why the universe emerged in such a peculiar state has not been fully resolved.

Well, I worked on that theory for a while with Dr. Stephen Hawking and others.

But then I started looking for other options.

Or that the Big Bang was not the beginning.

Perhaps the universe predates the explosion, and the explosion was simply a violent event in the existing universe.

This possibility is actually suggested by the most recent theory, the Unification Theory. A unified theory tries to explain all these 18 free parameters in one framework, and hopefully all of them can be predicted.

I share a cartoon of this idea here.

That's all I can tell. According to these theories, space has not only the three dimensions we are familiar with, but there are additional dimensions, and many more that exist throughout the room.

And in particular, among the most sophisticated unified theories we have, there is one that is rather strange.

What's weird is something like this: We live in a three dimensional world.

We live in one of these worlds, and although it can only be viewed as a sheet, it's really three-dimensional.

And a little further away, there is also a three-dimensional sheet, separated by gaps.

The gap is very small, so I zoomed in to see it.

But it's actually just a fraction of the size of an atomic nucleus.

I won't go into the details of why we think the universe is like this, but it comes from mathematics and attempts to explain the physics as we know them.

Well, I was intrigued by this because it seemed like a legitimate question.

So what if these two 3D worlds actually collided?

And when they collide, it will look a lot like the Big Bang.

But it's a little different from the traditional image.

The point is the image of the conventional Big Bang.

Everything comes from a point. you have infinite density. And all the equations fall apart.

I have no hope of explaining it.

In this photo, you can see that the bangs have grown. that's not the point.

Matter has a finite density, and a coherent set of equations can be obtained that can describe the entire process.

So, to make a long story short, we explored this alternative.

We show that it fits all the data we have on galaxy formation and microwave background fluctuations.

Moreover, apart from the inflationary explanation we talked about earlier, there is an experimental way of conveying this theory.

It involves gravitational waves.

And in this scenario, as you can see from the picture, the Big Bang isn't just the beginning, it could happen any number of times.

We may live in an infinite universe both spatially and temporally.

There have been big waves in the past, and there will be more waves in the future.

And perhaps we live in an infinite universe.

For me, building and testing a model of the universe is the best way to enjoy and appreciate it.

We need to create the best mathematical model possible, the most consistent mathematical model.

Then examine them logically and with data.

And we try to convince ourselves — we really try to convince ourselves that they are wrong.

When you prove things wrong, that's progress.

And gradually, I want to get closer and closer to understanding the world.

As I pursued my career, something was always eating into me.

what about africa?

What will happen to the children I leave behind?

Far from the development everyone had hoped for in the 60s, things got even worse.

Africa was plagued with poverty, disease and war.

This is very graphically illustrated by the Worldmapper website and project.

Therefore, the idea is to represent each country on the map and reduce the area according to a certain amount.

Here is a standard regional map of the world.

By the way, Africa is very big.

And the next map shows Africa's GDP in 1960, around the time many African countries became independent.

Well, this is 1990 and 2002. And here are the predictions for 2015.

Great changes are taking place in the world, but they are not helping Africa.

What about Africa's population? Although its population is not disproportionate to its area, Africa leads the world in deaths from preventable causes such as malnutrition, simple infections and complications of childbirth.

Next is HIV/AIDS. And there are deaths from war.

Currently, 45,000 people die every month in the Congo as a result of wars over coltan, diamonds, etc.

It's still going.

What is the capacity of Africa to do something about these problems?

Now, here are the numbers of doctors in Africa.

The number of people with higher education is:

And here, the most shocking thing for me is the number of scientific research papers coming out of Africa.

It just doesn't exist scientifically.

And this was very eloquently argued at TED Africa. All aid provided so far has failed utterly to make Africa self-reliant.

Well, the transition to democracy in South Africa in 1994 was literally a dream come true for many of us.

My parents were elected First Members of Parliament along with Nelson Mandela and Winnie Mandela. They were the only other couple.

In 2001, I took a research leave to visit them.

And during the day, while I was busy at work, I was grappling with these clashing worlds.

However, I have found that there is a desperate shortage of skills, especially mathematical skills, in industry, government and education.

The ability to create and test models has become essential not only in all areas of science today, but also in modern society itself.

And without mathematics, we cannot enter the modern age.

So I had an idea. And the idea was so simple.

The idea was to establish the African Institute of Mathematical Sciences (AIMS).

And we will gather students from all over Africa, gather lecturers from all over the world, and try to give them a good education.

As a Cambridge professor, I had many contacts.

And to my surprise, they supported me 100%.

They said, "Go and try, and we will come and teach you."

I also knew that it would be a lot of fun to bring together the best students from these countries who had no opportunity, along with some of the best lecturers in the world who I knew would come because of their interest in Africa, and spark them together.

So we bought an abandoned hotel near Cape Town.

80-room Art Deco hotel built in the 1920s.

The area was a bit shady, so I rented an 80-room hotel for $100,000.

It's a beautiful building. We refurbished it and declared in this hotel to start the best mathematics institute in Africa.

Well, the new South Africa is a very exciting country.

And if you've never been there, please do.

I am very, very interested in what is going on.

And we hired great, highly motivated staff.

Another thing that has happened, which has been good for us, is the Internet.

Internet is very expensive throughout Africa, but there are Internet cafes everywhere.

And bright young Africans are very ambitious, eager to participate and succeed in the international community.

They want to be the next Einstein.

So when rumors of an AIMS opening spread, they quickly spread through emails and websites.

And we received a lot of applications.

AIMS was designed as a 24-hour learning environment, but it was great to set up a university from the beginning.

We have to rethink what universities are for.

And it's really exciting.

Therefore, it was designed to enable interactive education.

Using a drone in front of a blackboard is prohibited.

Rather than chasing grades, we focus on problem solving, working in groups, and helping each student discover and reach their full potential.

Teachers and students all live together at this hotel, so it's no wonder there's an impromptu tutorial at 1am.

Students usually don't leave the computer lab until 2:00 or 3:00 am.

And they get up again at eight o'clock in the morning.

Lectures, problem solving, etc. It's a special place.

We place particular emphasis on areas that are highly relevant to Africa's development. Because in those areas, scientists working in Africa can gain a competitive advantage.

They may publish or be invited to conferences.

they will do well. They will build successful careers.

AIMS has done very well.

Here is a list of last year's alumni who graduated in June and their current activities - 48 of them.

And where they are is shown here.

and where did they go So these are all graduate students.

And they all have master's and doctoral degrees. A degree in an excellent location.

Five students can be educated at AIMS for the cost of educating one in the US or Europe.

But more importantly, Pan-African Student Organizations are a continuing source of strength, pride and dedication to Africa.

Color-coded AIMS progress in African countries.

You can see what's behind this list here.

If your county is yellow, we have received your application. Orange, application received. And green is the student graduated.

This is what we look like after our first graduation in 2004.

And we set a goal to turn the continent green.

So 2005, -6, -7, -8.

(Applause.) We're well on our way to our original goal.

Some students had their photos taken at home before coming to AIMS.

And I'll show you one.

Tendai Muguwagwa: My name is Tendai Muguwagwa.

I have a degree in Education and a Bachelor of Science degree.

Join AIMS.

My understanding of this course is that it covers quite a lot.

You know, from physics to medicine, especially epidemiology, and even mathematical modeling.

Neil Turok: So Tendai came to AIMS and it went very well.

And let her take you from there.

TM: My name is Tendai Muguwagwa. Was a student at AIMS in 2003 and 2004.

After leaving AIMS, I completed my Master's Degree in Applied Mathematics from the University of Cape Town, South Africa.

Then I came to Holland and am currently doing my Ph.D. in theoretical immunology.

Professor: Tendai is very independent.

She communicates well with the hospital's immunologist.

So, overall, I have a very good PhD. A student from South Africa.

So I am happy that she is here.

NT: Another AIMS freshman student was a chef.

And here he is with his favorite high school teacher.

And enrolled in a university in northern Nigeria.

After AIMS, Chef wanted to do high energy physics and came to Cambridge.

He's in the process of completing his PhD and was recently photographed with someone you know.

Chef: From there, hopefully we'll be able to make better predictions, and we can compare that to the graph and make some predictions as well.

Dr. Stephen Hawking: Good.

NT: Here are the current AIMS students. 53 of them are from 20 countries and 20 of them are women.

Well, I'm about to start working on TED.

Well, we threw a party. This is Africa. Africa has a good party. And last month they threw a surprise party for me.

You've already seen someone here.

(Applause.) I want to point out that there are some other good people in this picture.

So we were having a party and as you can see, at this point they have me completely under wraps.

I'm Ezra. She is from Darfur.

She's a physicist who somehow keeps a smile on her face even though there's a lot going on at home.

However, she wants to continue in the field of physics and is doing very well.

I'm Lydia. Lydia is the first woman in the Central African Republic to graduate in mathematics.

And she is now at AIMS. (Applause) So let me tell you what TED wants.

Well, that's not my TED wish. As you have already gathered, that is our wish.

And our wish has two parts. One is a dream and the other is a plan. OK.

Our TED dream is for the next Einstein to be African. (Applause.) To the heights of creative genius, we want to motivate, encourage, and inspire thousands of people to acquire the advanced skills they need to help Africa.

Among them are not only brilliant scientists, but I am sure from what I have seen at AIMS, they will also be the Gates, Brin and Pages of the future Africa.

Well, I said we have plans too. And our plan is very simple.

AIMS is now a proven model.

And all we have to do is reproduce it.

We hope to have 15 AIMS centers across Africa in the next five years.

Each student is pan-African, but they specialize in different scientific fields.

Like AIMS, we want to use science to overcome national and cultural barriers.

And we want to add elements to the curriculum.

We want to add entrepreneurship and policy skills.

The expanded AIMS will become a coherent pan-African institution and its alumni will form a powerful network, working together for peace and progress across the continent.

Last year, we visited our bases in Africa to find potential sites for new AIMS centers.

And here is what we chose.

And each of these centers has strong local teams, each center is in a beautiful location, an interesting location, and an international lecturer would be happy to visit.

And our partners across Africa are very enthusiastic about this.

Everyone wants an AIMS center in their country.

And last November, the All-African Science and Technology Ministers' Meeting in Mombasa called for a comprehensive plan to deploy AIMS.

So we have political support across the continent.

It's not easy.

Every field will have big challenges.

Local scientists must play a leading role, and governments must be persuaded to agree.

The situation is very difficult, but the principles that make AIMS work cannot be compromised.

We summarize these as follows: Research institutes must be relevant, innovative, cost-effective and of high quality. why?

Because we want Africa to prosper.

You can easily remember the basic rules you need.

So, in the end, only talented young Africans can solve Africa.

By unlocking and nurturing their creative potential, we can make a big difference in Africa's future.

Over time, they will contribute to Africa's development and science in ways we can only imagine.

thank you.

(applause)

At 14, I became interested in science, fascinated by science, and excited to learn about it.

And there was a high school science teacher in the class who said, "Girls don't have to hear this."

Inspiring, yes.

(Laughter) I decided not to listen, just the words.

Let us guide you to the Chilean Andes Mountains, 300 miles, or 500 kilometers, northeast of Santiago.

So remote, so dry, so beautiful.

And there are not so many.

There are condors and tarantulas, and at night, when the light dims, reveal one of the darkest skies on earth.

It's a kind of magical place, the mountains.

It's a wonderful combination of remote peaks and exquisitely sophisticated technology.

And since recorded history, our ancestors have gazed at the night sky and pondered the nature of our existence.

And our generation is no exception.

The only problem is that the night sky is obscured by the glare of the city lights.

That's why astronomers go to these very remote peaks to observe and study the universe.

In other words, a telescope is a window to the universe.

It's no exaggeration to say that the Southern Hemisphere is the future of astronomy in the 21st century.

There are already a number of existing telescopes in the Chilean Andes and will soon be joined by a highly sensational set of new features.

There will be two international groups trying to build giant telescopes that are sensitive to optical radiation, similar to our eyes.

A survey telescope will be installed to scan the sky every few nights.

A radio telescope, sensitive to long-wave radio radiation, will also be installed.

And there will be telescopes in space.

A successor to the Hubble Space Telescope will appear. It's called the James Webb Telescope and is scheduled to launch in 2018.

A satellite called TESS that will discover planets outside the solar system will appear.

For the past ten years, I have led an international group, a consortium, to build what, when completed, will be the largest optical telescope in existence.

It is called the Giant Magellan Telescope, or GMT.

This telescope has a diameter of each mirror of 8.4 meters.

It's about 27 feet.

That's why this stage looks small. Probably about the 4th row in this audience.

Each of the telescope's seven mirrors will be nearly 27 feet in diameter.

Together, the telescope's seven mirrors are 80 feet in diameter.

So essentially the size of this entire auditorium.

The total height of the telescope will be about 43 meters. Since you are in Rio, some of you may have gone to see the giant statue of Christ.

The scale heights are the same. In fact, it's smaller than this telescope.

Its size is comparable to the Statue of Liberty.

And it will be housed in a 22-storey, 60-metre-high enclosure.

However, it is an unusual building to protect this telescope.

It has windows that open to the sky so you can point your finger at the sky and it actually spins on the base of a 2,000-ton spinning building.

The Giant Magellan Telescope will have ten times the resolution of the Hubble Space Telescope.

It is 20 million times more sensitive than the human eye.

And for the first time in history, we may find life on a planet outside our solar system.

This will allow us to look back at the first light of the universe, literally the dawn of the universe.

cosmic dawn.

This is a telescope that allows you to look back and see what galaxies looked like when they really were together, the first black holes in the universe, the first galaxies.

Now, for thousands of years we have studied the universe and questioned our place in it.

The ancient Greeks said the earth was the center of the universe.

500 years ago Copernicus replaced the earth and put the sun at the center of the universe.

Every time we build a larger telescope, we've learned something about the universe, just as we've learned for centuries since the Italian scientist Galileo Galilei first pointed a very small two-inch telescope into the sky. We have made discoveries without exception.

In the 20th century, we learned that the universe is expanding, and that our solar system is not at the center of that expansion.

The universe now consists of about 100 billion visible galaxies, and we know that there are 100 billion stars within each of those galaxies.

So we are now looking at the deepest images of the universe ever taken.

This picture was taken using the Hubble Space Telescope by pointing the telescope into a previously empty region of the sky before Hubble's launch.

Imagine this tiny region, which is only 1/50th the size of the full moon.

So imagine a full moon.

And now there are 10,000 galaxies visible in that image.

And the faintness and diminutive size of those images are only a result of the fact that these galaxies are so distant and vast in distance.

And each of those galaxies could contain billions, even hundreds of billions of individual stars.

A telescope is like a time machine.

Therefore, the farther back in space you go, the farther back you go in time.

And they are like buckets of light - they literally collect light.

The bigger the bucket, the bigger the mirror, allowing you to see more light and see farther.

That is, we learned in the last century that there are exotic objects in the universe - black holes.

We have even learned that there is an invisible dark matter or dark energy.

So you are now looking at a real image of dark matter.

(Laughter) I understand. Not all viewers get it.

(Laughter) There's an undeniable gravitational pull that we can't see how we'd guess the existence of dark matter.

We can now look out and see the Galactic Ocean in the expanding universe.

I myself am going to measure the expansion of the universe. One of my projects in the 1990s used the Hubble Space Telescope to measure how fast the universe was expanding.

Now it can be traced back to 14 billion years.

We've learned over time that stars have individual histories. So they have a birth, they have a middle age, and some even die a dramatic death.

So the embers from those stars actually form the new stars we see, most of which turn out to have planets orbiting them.

One of the truly amazing results of the last two decades has been the discovery of other planets orbiting other stars.

These are called exoplanets.

And until 1995, we didn't even know there were other planets other than the ones that orbited the Sun.

But now there are about 2,000 planets orbiting other stars, and we can detect them and measure their mass.

Of those, 500 are multiple planetary systems.

And there are 4,000 other candidate planets orbiting other stars, and counting.

They come in an astonishing variety.

There are hot planets like Jupiter, ice planets, water worlds, rocky planets like Earth, the so-called "super-Earths", and even planets speculated to be diamond worlds.

Therefore, we know that there is at least one planet, our Earth, and that life exists within it.

Planets orbiting two stars have also been discovered.

It is no longer the realm of science fiction.

Therefore, we know that life exists and has developed complex life around our planet, and we can now question our own origins.

And considering everything we've found, the overwhelming numbers suggest that there may be millions, perhaps - perhaps even hundreds of millions, of other [planets] close enough, or just the right distance, from an orbiting star to potentially have liquid water and possibly sustain life.

So we marvel at the odds now, the overwhelming odds. And the amazing thing is that within the next decade, GMT may be able to capture spectra of these planets' atmospheres and determine whether they might harbor life.

So what is the GMT project?

It's an international project.

Among them are Australia and South Korea, but I am happy to say that a new partner for our telescopes is Brazil here in Rio.

(Applause.) This includes Harvard University, the Smithsonian Institution, the Carnegie Museums, the University of Arizona, the University of Chicago, the University of Texas at Austin, Texas A&M University, and many others across the country.

Chile is also involved.

So the way the telescope mirrors are made is interesting in itself.

A piece of glass is taken and melted in a furnace that rotates itself.

This takes place under the University of Arizona football stadium.

Tucked away among 52,000 seats.

No one knows it's happening.

And then there's essentially a spinning cauldron.

The mirror is cast, cooled very slowly, and then polished to exquisite precision.

So if you think about the precision of these mirrors, the irregularities on the mirrors are less than one millionth of an inch over the total length of 27 feet.

So can you imagine it?

Wow!

(Laughter) That's 1/5,000th the width of a single hair of mine over these 27 feet.

That's a great achievement.

This allows us to obtain high accuracy.

So what does that accuracy do for us?

So, GMT, as you can imagine, if I hold up a coin that I happen to have and look at the face of the coin, I can see the writing on the coin from here. You can see the face of the coin.

I don't think you can see it even if you're in the front row.

But if I were to stand in São Paulo, I would be able to figure out the surface of this coin if I were to point the Giant Magellan Telescope in this auditorium, 80 feet in diameter, 320 miles away.

That's the amazing resolution and power of this telescope.

If we were -- (Applause) If an astronaut went to the moon 250,000 miles away and lit a candle, it was a candle. Then we will be able to detect it using GMT.

Quite unusual.

This is a simulated image of a galaxy cluster in a nearby galaxy.

"Near" is astronomical and all relative.

It is tens of millions of light years away.

This cluster looks like this:

Let's take a look at these four bright objects and compare them with the Hubble Space Telescope camera.

You can see that faint details are starting to show.

And finally see how dramatic this is. This is what you see in GMT.

Now, take another look at that bright image.

This is what we see in one of the most powerful existing telescopes on Earth, and what we will also see at GMT.

Incredible precision.

So where are we?

We have now flattened the top of Chile's peak.

we blew it.

Tested and polished the first mirror.

Cast the second and third mirrors.

And I'm about to cast a fourth mirror.

We had a series of reviews this year, and an international committee came and reviewed us and said, 'We are ready to go into construction.

So I plan to build this telescope using the first four mirrors.

We hope to start broadcasting soon and have scientific data, or what astronomers call “first light,” in 2021.

And a complete telescope with all seven mirrors will be completed in the middle of the next decade.

Therefore, we are now ready to look back into distant space, the cosmic dawn.

We will be able to study other planets in detail.

But for me, one of the most exciting things about building GMT is the opportunity to really discover things that we don't know, that we can't even imagine right now, that are completely new.

And my hope is that the construction of this facility and others will inspire many young women and men to aim for stars.

thank you very much.

thank you.

(Applause) Bruno Giussani: Thank you, Wendy.

I have a question, please contact me.

You mentioned various facilities.

That means not only the Magellan Telescope will rise, but also ALMA and other telescopes in Chile and Hawaii elsewhere.

Is it about cooperation and complementarity, or about competition?

I know there is competition for funding, but what about science?

Wendy Friedman: In terms of science, they are very complementary.

Telescopes in space, telescopes on the ground, telescopes with different wavelength capabilities, telescopes with similar but different instruments, all focus on different parts of the question we are asking.

Therefore, discovering other planets will allow us to test their observations, measure their atmospheres, and observe the universe at very high resolution.

So they are very complementary.

You're right about funding. we are competing But scientifically they are very complementary.

BG: Wendy, thank you for coming to TEDGlobal.

WF: Thank you.

(applause)

Nobel Prize in Economics [winner] Paul Krugman once wrote, "Productivity isn't everything, but in the long run it's pretty much everything."

This is serious.

There aren't many "almost everything" on the planet.

Productivity is the main driver of social prosperity.

That's where the problem occurred.

Europe's largest economy experienced a 5% annual increase in productivity in the 50's, 60's and early 70's.

From 73 to 83: 3% per annum.

From 83 to 95: 2% per annum.

Since 1995: <1% per annum.

Same profile in Japan.

The same situation continues in the United States, despite a temporary recovery 15 years ago, and despite all the technological innovations around us: the Internet, information, new information and communication technologies.

A 3% annual increase in productivity doubles the standard of living for each generation.

Every generation is twice as wealthy as their parents.

At 1% annual growth, it would take three generations to double the standard of living.

And in the process, many will become less wealthy than their parents.

They will have a smaller roof, or no roof at all, and less access to education, vitamins, antibiotics, vaccinations, everything.

Think about all the problems we face today.

all.

Perhaps the cause lies in the crisis of productivity.

Why did this crisis occur?

This is because the basic principle of efficiency—effectiveness in organization and management—is counterproductive to human effort.

Everywhere in public service – in companies, the way we work, the way we innovate and invest – we are learning better ways to work.

Consider the trinity of efficiency, clarity, measurement and accountability.

They derail human efforts.

There are two ways to observe and prove it.

One, I prefer rigorous, elegant and wonderful mathematics.

However, the full math version takes a little longer, so here's another version.

Watching the Ekiden.

I will do this today.

It's a little more animated, more visual, and even faster - it's a race.

Hopefully it will be faster.

(Laughter) World Championship Finals - Women.

8 teams advance to the final.

The fastest team is the USA team.

They have the fastest women on the planet.

They are the favorite team to win.

It's worth noting that if you compare them to the average team, say the French team (laughs), based on their best performance in the 100m race, and adding the personal times of the American runners, they reach the finish line 3.2m faster than the French team.

And this year, the US team is doing great.

According to the data, they will arrive 6.4 meters ahead of the French team, based on their best performance of the year.

We will look at the races.

At some point in the closing stages, we find the fourth runner from the United States, Tori Edwards, in the lead.

Not surprisingly, this year she won the gold medal in the 100m race.

By the way, Team USA runner-up Kriste Gaines is the fastest woman on the planet.

That means there are 3.5 billion women on earth.

Which of the two is faster? Belongs to Team USA.

And the other two runners on the US team aren't bad either.

(Laughter) Clearly, the US team won the talent war.

But behind the scenes, average teams are catching up.

Let's see the race.

(Video: Race Narration by French Sportscaster) (Video: End of Race Narration) Yves Moreieu: So what happened?

The fastest team didn't win. The late one did it.

By the way, I hope you will appreciate the historical research I have done to make the French look good.

(Laughter) But let's not exaggerate. This is not even archeology.

(Laughter.) But why?

Thanks for your cooperation.

"Because of cooperation, the whole is more valuable than the sum of the parts." When you hear this sentence.

this is not poetry. This is not a philosophy;

This is mathematics.

The baton bearer is slow, but the baton is fast.

The Miracle of Cooperation: It multiplies the energy and intelligence of human endeavours.

It is the essence of human endeavour. It's how we work together and how each of our efforts contributes to the efforts of others.

Together, we can achieve more with less.

Now, what will happen to cooperation when the Holy Grail of clarity, measurement, accountability, and even the Holy Trinity emerge?

Clarity.

There are many complaints about the lack of clarity in management reports.

Compliance audits, diagnostics by consultants.

There needs to be more clarity, roles and processes need to be clarified.

It's as if the runners on the team are saying, "Let me be clear, where does my role really start and end?"

Should I run 95m, 96m, 97m? ”

It's important, so let's be clear.

If you say 97, after 97 meters there will be someone dropping the baton regardless of whether or not there is someone taking it.

Accountability.

We always try to put responsibility in someone else's hands.

Who is responsible for this process?

We need someone responsible for this process.

Passing the baton is very important in the ekiden, so we need someone with clear responsibility for passing the baton.

So between each runner there will be a new dedicated athlete who is clearly dedicated to taking the baton from one runner and passing it to the next.

And there will be at least two such.

Well, in that case, can we win the race?

I don't know, but it certainly has a clear interface and clear areas of responsibility.

I know who to blame.

But we can never win races.

Come to think of it, we are less concerned with setting the conditions for success than with knowing who is to blame if we fail.

What is the real goal of all the human intelligence put into organizational design, urban structures, processing systems, etc.?

to blame someone in case of failure.

We're building an organization that can fail, in a compliant way, and clearly accountable when it fails.

And while we are very effective at that, we are failing.

measurement.

What is measured is performed.

Passing the baton has to be done at the right time, with the right hand, and at the right speed.

But for that you need to put energy into your arms.

This energy that is in your arms is not in your legs.

Measurable speed is sacrificed.

When handing over the baton to the next runner, it should be yelled out early enough to signal its arrival so that the next runner is prepared and anticipates.

And you have to shout out.

But the blood and energy that is in the throat is not in the legs.

Because 8 people are screaming at the same time.

Therefore, you should recognize the voice of your colleagues.

I can't say, "Is it you?"

too late!

(Laughter) Now let's watch the race in slow motion and focus on the third horse.

See where she spends her effort, energy and attention.

That would be great for her own speed, not just her legs, but her throat, arms, eyes and brain as well.

Whose leg will it make a difference?

on the feet of the next runner.

But when the next runner runs super fast, is it because she's trying too hard, or is it because of how the third runner passes the baton?

There is no index on earth that gives the answer.

And if we reward people based on measurable performance, they will pour energy, attention and blood into something measurable: their legs.

And the baton drops and slows down.

Working together is not a trivial effort, it depends on how you distribute your efforts.

You're taking risks because you're sacrificing the ultimate protection afforded by objectively measurable individual performance.

It makes a huge difference in the performance of others to whom we are compared.

You have to be stupid to cooperate.

And people are not stupid. they don't cooperate.

You see, when the world was simpler, clarity, accountability and measurement were fine.

But business has become much more complicated.

My team and I have been measuring the evolution of complexity in our business.

Today, attracting and retaining customers, building a global edge and creating value are more demanding.

And the more complex a business becomes, the more structures, processes and systems grow in the name of clarity, accountability and measurement.

As you know, this commitment to clarity and accountability leads to a counterproductive proliferation of interfaces, middle offices and coordinators that not only mobilize people and resources, but add obstacles.

And the more complex the organization, the harder it is to understand what's really going on.

So we need summaries, proxies, reports, key performance indicators and metrics.

So people sacrifice cooperation to put their energy into what they can measure.

And as performance degrades, more structures, processes, and systems are added.

People spend time in meetings, writing reports that need to be done, undoing and redoing.

Our analysis shows that teams in these organizations waste between 40% and 80% of their time, but are working harder and longer on increasingly low-value activities.

This is what slows down productivity and makes people suffer at work.

Our organization is wasting human intelligence.

They have turned their backs on human efforts.

When people don't cooperate, look at the situation at work instead of blaming them for their way of thinking, mindset, or personality.

If doing so would worsen their personal situation, would it really be in their personal interest to cooperate?

why would they work together?

Blaming character instead of clarity, accountability, and recognition adds injustice to inefficiency.

We need to create an organization where individuals benefit from working together.

Get rid of all the complex coordination structures such as interfaces and middle offices.

Please don't ask for clarity. Pursue ambiguity.

Ambiguity abounds.

To assess performance, remove most of the quantitative metrics.

Speed ​​up "what".

Cooperation, pay attention to the "how".

How did you pass the baton?

Did you throw or did you pass effectively?

Am I putting my energy into something that can be measured, like my legs or my speed, or am I more focused on passing the baton?

As a leader or manager, do you find it personally beneficial for people to work together?

The future of our organization, company and society depends on your answers to these questions.

thank you.

(applause)

If you want to buy high quality, low cost cocaine, there really is only one place to go. It's a darknet anonymous marketplace.

Currently, these sites cannot be accessed with a regular browser (Chrome or Firefox). This is because these sites are located in a hidden part of the Internet known as Tor Hidden Services. A URL is a nonsensical string of numbers and letters ending in .onion and accessed with a special browser called the Tor browser.

Well, the Tor browser was originally an intelligence project for the US Navy.

After that, it became open source, allowing anyone to browse the net without revealing their location.

And it does this by encrypting your IP address and routing it through several other computers around the world that use the same software.

It works on the regular internet, but it's also the key to the darknet.

And thanks to this terrifyingly clever encryption system, it's incredibly difficult to shut down thousands of sites, I don't know if there are 20 or 30 or 30 that operate there.

A censorship-free world visited by anonymous users.

So it's a natural place for people with something to hide, and of course it's no wonder something doesn't have to be illegal.

On the darknet is the whistleblowing site "The New Yorker".

You'll find blogs about political activism.

You will find a library of pirated books.

But you'll also find drug markets, illegal pornography, and commercial hacking services.

The Darknet is currently one of the most interesting and exciting places on the Net.

The reason is that innovation, of course, happens in big companies and world-class universities, but it also happens on the fringes. Because people on the fringes – the outcasts and outcasts – are often the most creative, and they have to be.

You won't find a single lolcat or pop-up ad in this part of the internet.

And that's one of the reasons why I think many of you here will be going to the darknet soon.

(Laughter) I'm not suggesting that anyone in this audience uses it to source quality drugs.

But let's say you were for a moment.

(laughter) Please be patient.

The first thing you notice when you sign up for one of these sites is how familiar the site looks.

All products (thousands of products) include glossy high resolution images, detailed product descriptions and pricing.

There is a "Proceed to checkout" icon.

Best of all, it even has a "report this item" button.

(Laughter) It's unbelievable.

You browse the site, make a selection, pay with the cryptocurrency bitcoin, enter an address (preferably not your home address), wait for the item to arrive in the post, and this almost always happens.

The reason is not because of clever encryption.

It's important.

It's much simpler than that.

User review.

(Laughter) You know, all the vendors on these sites are using pseudonyms for granted, but they're using the same pseudonyms to boost their reputation.

And since it's easy for buyers to change their loyalty whenever they want, the only way to trust a vendor is if they have a good history of positive feedback from other users of the site.

And this introduction of competition and choice does exactly what economists expect.

Prices tend to go down, product quality tends to go up, and vendors are attentive, courteous, and consumer-centric, offering all kinds of special deals, one-offs, buy-one-free, free shipping, and more to keep customers happy.

I spoke with Drag Heaven.

Drugsheaven provided good, stable marijuana at an affordable price.

He had a very generous refund policy, detailed T's and C's, and good shipping times.

"Dear Drugheaven," I wrote via our internal email system, also encrypted of course.

"This is my first time here. May I buy you a gram of marijuana?"

A few hours later I got a reply.

they always reply.

"Hello, thanks for your email.

It's wise to start small. If I were you, I would too. ”

(Laughs) "So it's no problem to start with 1 gram.

Hope we can do business together.

Best of luck, drug heaven. ”

(Laughter) I don't know why he had a nice English accent, but I think he probably did.

Now, this kind of consumer-centricity is why, over a three-month period, 95 percent of the 120,000 feedback left on one of these sites were 5 out of 5.

Customers are king.

But what does that mean?

On the one hand, it means that there are more drugs and more readily available to more people.

In my opinion it's not a good thing.

But on the other hand, when taking drugs, there are appropriate methods to ensure a certain level of purity and quality, which is very important when taking drugs.

You can also buy from the comfort of your own home without the risks associated with buying on the street.

Now, as I said earlier, you have to be creative and innovative to survive in this market.

And the 20 or so sites currently in operation don't always work and aren't always perfect. The site I referred to was shut down 18 months ago, but prior to that it had traded $1 billion worth.

However, these markets are constantly innovating due to the difficult conditions and harsh environments in which they operate, always thinking of ways to become smarter, more decentralized, harder to censor, and more customer-friendly.

Let's take a look at the payment system.

Of course, you don't pay with a credit card. You will then be refunded directly to yourself.

That's where we use the cryptocurrency Bitcoin, which can be easily exchanged for real-world currencies and gives users a very high degree of anonymity.

However, in the early days of these sites, people noticed their flaws.

Some unscrupulous dealers ran off with people's bitcoins before mailing the drugs.

The community has come up with a solution called multi-signature escrow payments.

So when you buy something, you send bitcoin to a neutral and secure 3rd digital wallet.

A vendor who sees that I have sent an item can confidently send it to me and when I receive it, at least two of the three people involved in the transaction (vendor, buyer, site administrator) must sign the transaction with their own digital signatures before the money will be transferred.

wonderful!

elegant.

can.

But then I realized there was a problem with Bitcoin. Because all Bitcoin transactions are actually publicly recorded on a public ledger.

So if you're smart, you can figure out who's behind it.

So they came up with the tumbling service.

Hundreds of people send bitcoins to one address, they get jumbled up, the right amount goes to the right recipients, but they are different bitcoins, a micro-laundering system.

(Laughs) That's amazing.

Curious about what drugs are currently prevalent on the darknet market?

Check out the search engine Gram.

You can also purchase advertising space.

(Laughter) Are you an ethical consumer and worried about what the pharmaceutical industry is doing?

yes.

One vendor offers fair trade organic cocaine.

(Laughter.) It's not funded by Colombian drug lords, it's farmers in Guatemala.

They even promised to reinvest 20 percent of their profits in local education programs.

(Laughs) There is also a mystery shopper.

Now, no matter what you think about the morality of these sites - which I don't think is actually a trivial matter - to create a functioning, competitive anonymous marketplace where no one knows who is who and is always in danger of being shut down by the authorities is an amazing achievement, a phenomenal achievement.

And it is such innovations that are why those on the fringes are often the forerunners of what is to come.

Because of the short lifespan of the Internet, it's easy to forget that it has actually changed many times over the last 30 years or so.

It started as a military project in the 70s, morphed into an academic network in the 1980s, was adopted by commercial enterprises in the 90s, and infiltrated all of us through social media in the 1990s, but I think it will change again.

And things like darknet markets are creative, safe, hard to censor, and I think that's the future.

The reason it's the future is because we're all concerned about privacy.

Surveys consistently show privacy concerns.

The more time we spend online, the more anxiety we have online, and these studies show that our anxiety is growing.

We worry about what happens to our data.

We are worried about who is watching us.

Since the Edward Snowden revelations, there has been a significant increase in the number of people using various privacy-enhancing tools.

There are currently between 2 and 3 million daily users of the Tor Browser, most of which are completely legal and sometimes even routine uses.

And hundreds of activists around the world are working to develop technologies and tools to protect your privacy online: the default encrypted messaging service.

Ethereum is a project that attempts to link the connected but unused hard drives of millions of computers around the world to create a kind of decentralized internet that no one can really control.

Of course, we've had distributed computing before.

We use it for everything from Skype to searching for extraterrestrial life.

But adding distributed computing and strong encryption makes censorship and control very difficult.

Another service called MaidSafe works on a similar principle.

Others, such as what is called Twister.

The point here is that the more we participate, the more interesting those sites become, and the more people participate.

And I think that's what happens.

In fact it has already happened.

The Darknet is no longer a dealer's den or a whistleblower's lair.

It's already becoming mainstream.

Just recently, musician Aphex Twin released an album as a darknet site.

Facebook has launched a darknet site.

A group of London architects have set up a darknet site for those concerned about their restoration projects.

Yes, the darknet is going mainstream and I predict that soon all social media companies, all major news outlets, and therefore most of this audience will be using the darknet as well.

In short, the Internet is about to become more interesting, more exciting, more innovative, more frightening, and more disruptive.

Good news for those who value freedom.

Good news for those who value freedom.

Good news for those who value democracy.

Whether you want to browse illegal porn or buy and sell drugs with impunity, this is good news.

It's neither completely dark nor completely bright.

It's not one that wins, it's that they both win.

thank you very much.

(applause)

Chris Anderson: You were something of a math genius.

When you were younger, you already taught at Harvard and MIT.

Then I got a call from the NSA.

what was it about?

Jim Simmons: Well, the NSA -- the National Security Agency -- they didn't call exactly.

They hired mathematicians at Princeton to attack secret codes and other things.

And I found out that it exists.

And they had a very good policy. Because I can spend half my time doing my math and at least half my time working on their work.

And they paid a lot of money.

It was an irresistible pull.

So I went there.

CA: You were a code breaker.

JS: Yes.

CA: Until you got fired.

JS: Well, yes, I was fired. yes.

K: why?

JS: Eh, why?

I was fired because the Vietnam War had just started and one of my bosses in my organization was a big fan of the war and wrote a cover story for the New York Times article on how to win in Vietnam.

And I didn't like that war, I thought it was stupid.

And I wrote to The Times saying that even if some people remember Mr. Maxwell Taylor's name, not everyone who works for the company agrees with his view.

And I gave my opinion...

CA: Oh, okay. You'll see -- JS: ...that's different than General Taylor's.

But in the end no one said anything.

But then I was 29 and a kid came up and said he was a stringer for Newsweek magazine and wanted to interview me and ask me what I was doing about my opinion.

And I said to him, "I'm mainly doing mathematics now. When the war is over, I'm going to mainly do their work."

Then I did the only wise thing I did that day. I told my local boss that I accepted the interview.

And he said, "What did you say?"

And I told him what I said.

Then he said, "I have to call Taylor."

he called Taylor. It took 10 minutes.

Five minutes later I was fired.

CA: Okay.

JS: But it wasn't bad.

CA: It wasn't bad. Because you went to Stony Brook and stepped up your math career.

You started working with this guy here.

who is this?

JS: Ah, [Shine Shen] Churn.

Chern was one of the great mathematicians of this century.

I knew him when I was a graduate student at Berkeley.

And I had some ideas, so I brought them up to him and he liked them.

we did this work together. This work is easy to see.

there it is.

CA: That's how you ended up publishing a well-known paper together.

Can you explain a bit what the job was?

JS: No.

(laughs) JS: I mean, I can explain it to someone.

(laughs) CA: How about explaining this?

JS: But not that many. Not so many people.

CA: I think you said it had something to do with spheres, so let's start here.

JS: Well, but let me tell you about the work -- it certainly had something to do with it, but before I get into that -- the work was good mathematics.

i was very satisfied. So was Churn.

It even started a small subfield that is now thriving.

But more interestingly, it happened to be in physics that we knew nothing about -- at least I knew nothing about physics, and I don't think Chern knew much.

And about ten years after this paper was published, a guy named Ed Witten from Princeton started applying it to string theory, and people in Russia started applying it to so-called "condensed matter."

Today there is what is called the Chern-Simons invariant that is pervasive in much of physics.

And it was amazing.

We knew nothing of physics.

I never thought it would apply to physics.

But that's the nature of mathematics, and you never know where it's going.

CA: This is really unbelievable.

Now, we've talked about how evolution shapes the human mind whether it recognizes the truth or not.

Despite his lack of knowledge in physics, he somehow came up with a mathematical theory, and twenty years later discovers it has been applied to deeply describe the real physical world.

How could that happen?

JS: God only knows.

(Laughter) But there was a famous physicist named [Eugene] Wigner who wrote an essay on the irrational validity of mathematics.

Somehow this mathematics, in a way, is rooted in the real world, we learn to count and measure, everyone will do it, but then it thrives on its own.

But it often comes back to save the day.

General relativity is an example.

[Hermann] Minkowski had this geometry, and Einstein realized, "Hey! This is where general relativity applies."

So you never know. It's a mystery.

It's a mystery.

CA: So here's the mathematical ingenuity.

Please tell me about this.

JS: Well, it's a ball -- a sphere with a grid around it -- you know, those squares.

What we present here was originally observed by the great mathematician [Leonhard] Euler in the 1700s.

And it gradually grew into a very important branch of mathematics, algebraic topology, geometry.

The roots of that paper there were in this.

It has 8 vertices, 12 edges and 6 faces.

And when you look at the difference (vertices minus edges and faces), you can see two things.

Okay, so two. That's a good number.

This is another method. These are covered with triangles. It has 12 vertices, 30 edges, 20 faces and 20 tiles.

And the value of edges plus faces minus vertices is still equal to 2.

In fact, you can do this any way you want. Cover this with all sorts of polygons and triangles and mix them up.

And if you take the vertices minus the edges and faces, you get two.

Here is a different shape.

This is the torus, or donut surface. There are 16 vertices, 32 edges and 16 faces covered by these rectangles.

A vertex minus an edge is zero.

It will always be zero.

Every time you cover the torus with squares, triangles, etc., you get zero.

Hence, it is called the Euler characteristic.

And it's called a topological invariant.

Pretty amazing, isn't it?

No matter how I do it, I always get the same answer.

This was the first push into what is now called algebraic topology, from the mid-1700s.

CA: And your own research has taken these ideas and transferred them to higher dimensional theories, higher dimensional objects, and discovered new invariants?

JS: Yes. Well, there were already high-dimensional invariants. There was a Pontryagin class, actually a Churn class.

There were a lot of invariants of this kind.

I worked on one of them and was struggling to model it in some combination rather than the way it's usually done. That led to this work, and there were some new discoveries.

But without Mr. Euler -- who wrote nearly 70 math books, had 13 children, and apparently let them hang in his lap while writing -- these invariants probably wouldn't have existed.

CA: Okay. So at least I got a taste of the great spirit there.

Let's talk about the Renaissance.

You were a code breaker for the NSA, so you started being a code breaker in the financial world.

I think you probably haven't bought efficient market theory.

Somehow you found a way to generate amazing profits over the next 20 years.

What's remarkable about what you've done, as explained to me, is not just the size of the return, but the profit you've made with surprisingly low volatility and risk compared to other hedge funds.

So how the hell did you do this, Jim?

JS: We brought together an amazing group of people to make it happen.

When I started trading, I was a little bored with math.

I was in my late 30s and had a little money.

I started trading and it went very well.

I made a lot of money out of sheer luck.

I mean, I think it was pure luck.

It certainly wasn't mathematical modeling.

But looking at the data, after a while I realized that there seems to be some structure here.

And so I hired a few mathematicians and started building some models. Just like we did at the IDA [Defense Analytical Institute].

Design your algorithm and test it on your computer.

Is it effective? Does it not work? and so on.

CA: Can you take a look at this?

Because this is a typical graph for a product.

I looked at it and said, "This is just random ups and downs. Maybe a slight uptrend for the whole period."

How on earth can you trade while looking at it and making sure it's not just random?

JS: Back in the day, it's kind of like the old charts, but there were trends in commodities and currencies.

We don't always have very light trends like what we see here, but we do see trends over a period of time.

And if you decide, 'Okay, let's try to predict today from the average movement of the last 20 days,' maybe that's a good prediction, and I'll make some money.

And indeed, many years ago, such a system worked. Not pretty, but it worked.

You will make money, you will lose money, and you will make money.

But that's a year's worth of days, during which you'll make a little money.

It's a very nostalgic system.

CA: So you're testing a set of trends over a period of time to see if the 10-day trend and the 15-day trend can predict what happens next.

JS: Sure, I'll try them all and see what works best.

Following trends would have been great in the 60's and somewhat OK in the 70's.

In the 80's, it wasn't.

CA: Because everyone could see it.

So how did you stay ahead of the competition?

JS: We stayed ahead of the competition by finding other approaches, some short-term approaches.

The real thing is collecting vast amounts of data, which in the early days had to be obtained manually.

We went to the Federal Reserve and copied the interest rate history, etc. Because it didn't exist on the computer.

We got a lot of data.

And very smart people, that was the key.

I had no idea how to hire people to do fundamental trading.

I hired some people, some made money, some didn't.

I couldn't turn it into a business.

But I knew how to hire scientists. Because I had some interest in that field.

So that's what we did.

And these models were gradually improved and improved further.

CA: You're not just lured into the money to hire a gun, you're being credited with doing something remarkable in the Renaissance that's building this culture, this group.

Their motivation was to do exciting math and science.

JS: Well, I was hoping that might be true.

But part of it was money.

CA: They made a lot of money.

JS: I can't say nobody came for the money.

I think many people came for the money.

But they also came because it was fun.

CA: What role has machine learning played in all of this?

JS: In a way, what we did was machine learning.

Go through large amounts of data and try to simulate different forecasting schemes until you get better and better.

The way we do things doesn't necessarily feed back on itself.

But it worked.

CA: So these different forecasting schemes can actually be very wild and unexpected.

I mean, you've seen it all, right?

We looked at the weather, dress lengths, and political opinions.

JS: No, I didn't try the length of the dress.

CA: What do you mean?

JS: Well, everything.

Everything is important, except the hem length.

Weather, annual reports, quarterly reports, historical data itself, volume, whatever.

anything.

We ingest terabytes of data per day.

Then store it, massage it, and get it ready for analysis.

You are looking for anomalies.

What you are looking for is, as you said, the efficient market hypothesis is incorrect.

CA: But any anomaly could just be a coincidence.

So the trick here is to watch multiple strange anomalies and see when they match up?

JS: Any anomaly can be random. However, with enough data, we know that's not the case.

You can see anomalies that persist long enough. It's not likely that it's random.

But these things go away after a while. Anomalies can be washed away.

Therefore, you need to stay on top of your business.

CA: A lot of people look at the hedge fund industry right now and are kind of shocked by how much wealth is being created there and how much talent is flowing into it.

Do you have any concerns about the industry, and perhaps the financial industry in general?

Is it like being on a runaway train that contributes to -- I don't understand -- increasing inequality?

How do you defend what is happening in the hedge fund industry?

JS: I don't think hedge funds have performed particularly well in the last three or four years.

We've had a dandy performance, but the hedge fund industry as a whole hasn't done very well.

As we all know, the stock market is doing well and so is the price/earnings ratio.

So a significant portion of the wealth created in the past, the last five to six years, was not created by hedge funds.

People ask me, "What is a hedge fund?"

And I would say "1 and 20".

So now it's 2 and 20. 2 percent fixed commission and 20 percent profit.

Hedge funds are all different kinds of creatures.

CA: Rumor has it that they charge a little more than that.

JS: We used to charge the highest fees in the world.

5 and 44, that's the price.

CA: 5 and 44.

So 5% flat and 44% up.

Yet you have brought in an incredible amount of money for investors.

JS: Yes, good profit.

People were very angry, "How can you charge such a high price?"

I said, "Okay, you can withdraw."

But, 'How can I get more?' That's what people were -- (Laughter) But I think I said earlier, the fund has excess capacity, so at some point it bought all the investors.

CA: But should we worry that the hedge fund industry is bringing together too much of the world's greatest mathematical and other talent to tackle that problem, as opposed to many other problems in the world?

JS: Well, it's not just math.

We employ astronomers, physicists, etc.

I don't think you should worry too much.

It's still a fairly small industry.

And indeed, bringing science into the investment world has improved the investment world.

Volatility goes down. Liquidity improvement.

Spreads are tight because people are trading such things.

So I'm not too worried about Einstein quitting and starting a hedge fund.

CA: But you're at a stage in your life where you're really investing on the other side of the supply chain. In fact, it is promoting mathematics all over America.

This is your wife, Marilyn.

You are working together on philanthropic issues.

Please tell me about it.

JS: Well, Marilyn started -- there she is, my beautiful wife -- she started the foundation about 20 years ago.

I think it was 94.

I insisted it was 93 and she said it was 94 but that was one of those two years.

(Laughter) We set up the foundation as a convenient way to do philanthropic work.

She kept books and such.

We didn't have a vision at the time, but gradually a vision emerged that focused on mathematics and science and focused on basic research.

And that's what we did.

About six years ago, I left Renaissance to work for the Foundation.

that's what we do.

CA: So Math for America is basically investing in math teachers across the country, giving them extra income, providing support and coaching.

And we are serious about making it more effective and making it a mission that teachers can aspire to.

JS: Well -- instead of bashing bad teachers for causing morale problems in education as a whole, especially math and science, we're focused on honoring good teachers and giving them status.

Yeah, we give them $15,000 extra money a year.

New York City public schools now have 800 math and science teachers as part of their core.

There is great morale between them.

They are left in the fields.

Next year that number will be 1,000, or 10 percent of math and science teachers in New York City's public schools.

(Applause) CA: Jim, there's another project that you've been charitably supporting. Is it a study on the origin of life?

what are we looking at here?

JS: Well, I'll save that for a moment.

And I'll tell you what you're looking at

The origin of life is an interesting question.

how did we get here

Well, I have two questions. One, what is the path from geology to biology? How did you get here?

And another question is, where did you start?

What materials did you have to use for this route?

These are two very interesting questions.

The first question is the winding road from geology to RNA and more, but how did that happen?

The other is what we need to work on.

Well, more than we think.

So what you see there is a star in the process of forming.

Currently, the Milky Way galaxy, which has 100 billion stars, is forming about two new stars every year.

Please don't ask how I made it. But they are made.

And it would take about a million years for them to settle.

Therefore, at steady state, about 2 million stars are forming at any given time.

It's somewhere in this plateau.

And there is garbage and other garbage flying around it.

And it will likely form the solar system or whatever it forms.

But here's the problem. Important organic molecules have been discovered in this dust that surrounds forming stars.

Molecules such as formaldehyde and cyanide, as well as methane, are the building blocks of life, kind of like seeds.

So maybe that's typical.

And it may be typical for planets around the universe to start with some of these basic building blocks.

Now, does that mean there is life around?

perhaps.

But the question is, from its fragile beginnings, seed to life, how winding this road is.

And most of those seeds will fall on fallow planets.

CA: So, for you personally, I would love to see an answer to this question of where did we come from and why did this happen?

JS: I would love to see it.

And I want to know—whether that road is winding enough, impossibly winding, that we can become singular no matter what we do.

But on the other hand, given this organic dust in the air, we may have many friends.

It would be nice to know.

CA: Jim, a few years ago, I had the opportunity to speak with Elon Musk, and I asked him the secret of his success, and he said that he took physics seriously.

I heard from you that you take math seriously and that it permeates your entire life.

You've made an absolute fortune that you can now invest in the future of thousands of children across America and beyond.

Does science really work?

Does that calculation actually work?

JS: Well, math certainly works. Mathematics certainly works.

But this was fun.

It was a lot of fun working with and gifting Marilyn.

CA: That's exactly what I found. It's an inspirational thought to me that by taking knowledge seriously, you can get more out of it.

Thank you for your wonderful life and for coming to TED.

thank you.

Jim Simmons!

(applause)

Today we will talk about work.

And the question I want to ask and answer is, "Why do we work?"

Why are we dragging ourselves out of bed every morning instead of living a life filled with just hopping from one TED-like adventure to the next?

(Laughter.) You may be asking yourself that very question.

Of course, we know we have to make a living, but no one in this room thinks that's the answer to the question, "Why do we work?"

Our work is challenging, engaging, exciting, and meaningful to the people in this room.

With any luck, it might turn out to be important.

I mean, if we don't get paid, we won't work, but that's not why we work.

And in general, I think we think material rewards are pretty bad reasons to do what we do.

When we say someone is "doing it for money," it's not just descriptive.

(Laughter) Now, I think this is quite obvious, but the obviousness raises a very deep question for me.

If this is so obvious, why is it that for the vast majority of people on the planet the work they do has none of the features that make us get out of bed every morning and go to the office?

What causes the majority of people on earth to do monotonous, meaningless, soul-dead work?

Why did capitalism develop a mode of production of goods and services that eliminated all immaterial gratification from work?

Workers in this type of work, whether in factories, call centers, or fulfillment warehouses, are paid jobs.

Indeed, there is no other earthly reason to do what they do other than the salary.

So the question is "why?"

The answer is: The answer is technology.

Well, I know, I know -- yes, yes, technology, automation messes people up, somehow -- that's not what I mean.

I'm not talking about the technology that wraps around our lives that people come to TED to hear.

I'm not talking about the technology of things, it's the depth.

We are talking about another technology.

I'm talking about idea technology.

I call it "idea technology". How clever I am

(Laughter) Science doesn't just produce things, it also produces ideas.

Science creates ways of understanding.

And in the social sciences, the ways of understanding that are produced are the ways of understanding ourselves.

They influence how we think, what we aim for, and how we act.

If you think your poverty is God's will, you pray.

When you see your poverty as the result of your own inadequacy, you shrink into despair.

And if they think their poverty is the result of oppression and domination, they will revolt.

Whether your reaction to poverty is resignation or revolution depends on how you understand the causes of your poverty.

This is the role that ideas play in shaping who we are, and why idea technology is the most important technology science has to offer us.

And there is something special about idea technology that is different from thing technology.

Things will disappear if technology fails.

Bad technology fades away.

As far as ideas are concerned, false ideas about man will not disappear as long as people believe it to be true.

Because when people believe their ideas to be true, they create a way of life and an institution that conforms to these very false ideas.

The Industrial Revolution thus created a factory system in which there was nothing to be gained from a day's work except a paycheck at the end of the day.

Because my father--Adam Smith, one of the fathers of the Industrial Revolution--was convinced that humans were inherently lazy and would do nothing unless they made it worth their time, and the way to make it worth their time was to encourage and reward them.

That was the only reason anyone did anything.

So we created a factory system that fits with our fallacy of human nature.

But once that production system was in place, there really was no way for people to operate other than in a way that was consistent with Adam Smith's vision.

So the example in this work is just one example of how a false idea can create a situation that ends up making it true.

It's not true that "I can't get good help anymore".

Indeed, if you give a person a humiliating and soulless job, "there will be no more good help."

And, interestingly enough, Adam Smith, the same man who gave us the marvelous invention of mass production and the division of labor, understood this.

He said of people who worked on an assembly line, men who worked on an assembly line, "He generally becomes as stupid as a human being can be."

Now notice that the word here is "become".

"He usually gets as stupid as humanly possible."

What Adam Smith was telling us there, whether he meant it or not, is that the very forms of organizations in which people work produce people who fit the needs of those organizations, robbing us of the opportunity to find satisfaction in the work we take for granted.

What I can say about science, the natural sciences, is that we have the complete confidence that we can weave wonderful theories about the universe, and that the universe is completely indifferent to our theories.

Whatever theory we have about the universe, it will work the same way.

But we should worry about the theories we have about human nature. Because human nature is changed by the theories we have to explain and help us understand human beings.

Renowned anthropologist Clifford Geerts said several years ago that humans are "unfinished animals."

And what he meant by that is that human nature is precisely the product of the society in which we live.

That humanity, our humanity, is far more created than discovered.

We design humanity by designing the institutions in which people live and work.

Therefore, you, the closest I have ever been with the Masters of the Universe, should ask yourself when you go home and run your organization.

What kind of humanity do you want to design?

thank you.

(Applause.) Thank you.

You oversee the delivery of vital supplies to a rebel base in the heart of enemy territory.

All packages must follow strict protocols to pass through Imperial Customs. If the bottom of the box is marked with an even number, the top must be sealed in red.

By the time you receive the emergency message, the boxes have already been loaded into the transport vehicle.

One of the four boxes was mis-sealed and I lost track of which was which.

All the boxes are still on the conveyor belt.

Two are facing down, one marked 4 and one marked 7.

The other two are facing up, one with a black top and one with a red top.

You know that violating protocol will result in the confiscation of the entire shipment, putting your allies in grave danger.

However, the box pulled for inspection does not reach the delivery this time, and the rebels are robbed of essential supplies.

The transport departs immediately with or without cargo.

Which box should I grab from the conveyor belt?

Pause the video now if you want to figure it out for yourself.

Answers: 3 Answers: 2 Answers: 1 It may seem like you need to inspect all four boxes to see what's on the other side of each.

But in reality, only two of them are important.

Let's look at the protocol again.

All it says is that the tops of even-numbered boxes must be red.

You can ignore the boxes marked with a 7 as nothing is written about the odd numbered boxes.

What about the red box above?

Don't you need to check that the numbers below are even?

As it turns out, it's not.

The protocol stipulates that if the box is even numbered, its top must be red.

It's not that only boxes with even numbers can have red tops, or red top boxes must be even.

The requirement applies only in one direction.

Therefore, there is no need to tick the red lidded box.

However, you should check the ones with black lids to make sure they aren't misplaced in the even-numbered boxes.

First off, if you thought the rule implied a symmetrical match between box number and lid type, you aren't the only one.

This mistake is so common that it has even been named the Fallacy of Affirming Consequences or vice versa.

This fallacy erroneously assumes that certain conditions should be sufficient simply because they are necessary for certain results.

For example, having an atmosphere is a prerequisite for being a habitable planet.

However, this does not mean that it is a sufficient condition. Planets like Venus have atmospheres but lack other criteria for habitability.

If you still find it difficult to understand, let's consider a slightly different problem.

Imagine a box filled with groceries.

One marked to ship to a steakhouse and one to a vegetarian restaurant.

Then you'll see two more boxes upside down. One is labeled as containing meat and the other is labeled as containing onions.

Which should I check?

Well, it's easy. Just make sure the meat isn't being shipped to a vegetarian restaurant, and that the box sent to the vegetarian restaurant doesn't contain meat.

Onions can go either way, and steakhouse boxes have both products.

Why does this scenario look easy?

Formally, this is the same problem. There are two possible conditions on the top of the box and two conditions on the bottom.

In this case, however, they are based on well-known real-world needs, and it is easy to see that vegetarians only eat vegetables, but they are not the only ones to do so.

In the original problem, the rules seemed more arbitrary, but abstracted like that, the logical connections are less visible.

In your case, you managed to raise enough supplies for the Resistance to fight another day.

And you thought outside the box and thought of both sides and did it.

Yes, we all need a reason to wake up.

In my case, I needed 11,000 volts.

I know you're too polite to ask, so I'll tell you.

One night in my sophomore year, just returning from Thanksgiving vacation, a few friends and I were having a blast and decided to climb onto a stopped commuter train.

It just sat there with wires strung over its head.

For some reason it seemed like a great idea at the time.

We were certainly doing more stupid things.

I rushed up the ladder behind me and when I stood up, an electric current entered my arms and blew me off my legs, and that was it.

Do you believe the clock still works?

lick!

(Laughter) My father wears it now in a sense of unity.

That night was the beginning of my formal relationship with death, my death, and the beginning of my long life as a patient.

That's a good word.

It means someone who is suffering.

I think we are all patients.

Today, America's healthcare system is certainly as dysfunctional as it is great.

I am now an internist and also a hospice and palliative medicine physician, so I have seen care from both sides.

And believe me. Most people in healthcare have really good intentions. I mean, I really think so.

But those of us who work there are also unwitting agents of a system that too often fails.

why?

Actually, this question has a very simple answer, which explains a lot. Medicine is designed around the disease, not the person.

So of course it was badly designed.

And nowhere is the impact of bad design more heartbreaking and the opportunity for good design more compelling than at the end of life, when things are so distilled and concentrated.

No redo.

My purpose today is to reach out across disciplines and bring design thinking into this big conversation.

It is about bringing intention and creativity to the experience of death.

Faced with one of the few universal problems, both as individuals and as civil society, we have a monumental opportunity before us to rethink and redesign how we die.

So let's start at the end.

For most people, the scariest thing about death is not dying, but dying and suffering.

That's an important difference.

To solve this problem, it is very helpful to remove the suffering that is necessary in the present from the suffering that we can change.

The former is natural, an essential part of life, part of the contract, against which we are called to create space, adjust, and grow.

It is really good to realize that there is a power greater than ourselves.

They bring about proportionality like the proper size of the universe.

For example, after I lost my limb, that loss became a fact, a permanent part of my life, and inevitably a part of my life, and I learned that I cannot reject this fact any more than I reject myself.

It took me some time, but I eventually mastered it.

Now, another great thing about necessary suffering is that it's what connects the caregiver and the care recipient, the human being.

We finally realized that this is where healing happens.

Yes, as we learned yesterday, compassion literally suffers together.

On the system side, much of the suffering is unnecessary and invented.

It serves no good purpose.

But the good news is that this brand of suffering is manufactured and can be changed.

How we die is certainly something we can influence.

Sensing your system to this fundamental distinction between necessary and unnecessary suffering gives you the first of three design cues of the day.

Ultimately, our role as caregivers and caregivers is to alleviate suffering, not add to it.

True to the tenets of palliative care, I am both a prescribing physician and a thoughtful advocate.

As an aside, palliative care is a very important and poorly understood area. Palliative care includes, but is not limited to, end-of-life care.

It's not limited to hospice.

It's simply about comfort and living comfortably at every stage.

So know that you don't have to die right away to benefit from palliative care.

Now let me introduce you to Frank.

This is certainly true.

I have seen Frank for many years now.

He lives with advanced prostate cancer in addition to years of HIV infection.

We are working on treating his bone pain and fatigue, but we spend most of our time thinking out loud about his life, and indeed ours, together.

Frank is so sad.

In this way, he catches up with each loss that comes his way, ready to embrace the next moment.

Loss and regret are two very different things.

Frank has always been an adventurer, looked like something out of a Norman Rockwell painting, and never regretted it.

So it was no surprise when he came to the clinic one day and said he wanted to raft the Colorado River.

Was this a good idea?

Some would say no, given all the risks to his safety and health.

Many have done so, but he still tried while he could.

It was a glorious and wonderful trip. Freezing water, blistering dry heat, scorpions, snakes, wildlife howling from the burning walls of the Grand Canyon, all of the glorious aspects of a world beyond our control.

Frank's decision may be dramatic, but it's exactly the kind of decision most of us would make if we had the support to take the time to figure out what was best for us.

A lot of what we are talking about today is a shift in perspective.

After my accident, when I returned to college, I changed my major to art history.

Studying visual arts, I wanted to learn something about how I see things. This is a very powerful lesson for children who can't change much about what they see.

As a point of view, it is like alchemy that we human beings turn suffering into flowers.

Flashforward: Right now I'm working at a wonderful place called the Zen Hospice Project in San Francisco. There is a little ritual going on that helps with this shift in perspective.

When one of our residents died, we stopped as the undertaker came and carried the body out through the garden to the gate.

Anyone who wants to -- fellow residents, families, nurses, volunteers and hearse drivers -- now sprinkles themselves with petals and shares stories, songs and silence.

It will take a few minutes. It's a sweet, simple image of a breakup that greets you with grief, not with disgust, but with warmth.

Contrast this with a typical experience in a similar hospital setting. The floodlit room is lined with tubes, beeping machines, and flashing lights that continue until the patient's life is over.

Cleaners storm in and the bodies are carried away, making the person feel as if they never existed.

Well-intentioned, of course, in the name of sterility, hospitals tend to attack our senses, and within their walls the most we can expect is anesthesia, the literal opposite of aesthetics.

I admire what hospitals can do. I am alive because of them.

But we ask too much of hospitals.

These are sites of acute trauma and treatable illness.

They are not a place to live and die. It wasn't designed for that.

Let me tell you, I haven't abandoned the idea that our organization can be more humane.

Beauty is found everywhere.

I spent several months in the burn ward of St. Barnabas Hospital in Livingston, New Jersey. There, I received really good care in every aspect, including appropriate palliative care for my pain.

Then one night it started to snow outside.

I remember the nurses complaining about driving through there.

My room didn't have a window, but just imagining it falling down on me made me so happy.

The next day, one of the nurses smuggled in a snowman for me.

She brought it into the unit.

Words cannot describe the joy I felt when I held it in my hand and the chill it felt on my burning skin. The miracle of it all, the fascination of seeing it melt into water.

In that moment, being part of this planet in this universe was more important to me than living or dying.

That little snowman had all the inspiration I needed to try and not live.

In the hospital, it's a stolen moment.

Over the years of my work, I have known many people who are ready to die, ready to die.

Not because they had found final peace or transcendence, but because they were so disgusted that their lives had, in a word, been truncated or ugly.

A record number of people are already living into old age with chronic and terminal illnesses.

And we are not ready or unprepared for this silver tsunami.

We need a dynamic infrastructure that can handle this demographic upheaval.

Now is the time to create something new, something important.

I know I can because I have to.

Alternatives are totally unacceptable.

And we know the key elements: policies, education and training, systems, and examples.

We have tons of opinions so designers of all stripes can work together.

For example, we know from research what is most important to people near death. You feel less burdened and less burdened on your loved ones. existential peace. and a sense of wonder and spirituality.

Over the nearly 30 years of Zen Hospice, we have learned more and more details from our residents.

Small things are not so small.

Please take Janet.

With ALS, she noticed that she was having trouble breathing with each passing day.

Well, what do you think?

She wants to start smoking again. If you don't mind, I'd also like to smoke French cigarettes.

Not out of self-defeating tendencies, but because she feels her lungs filling while they fill.

Priority changes.

Or Kate--she just wanted to know her dog Austin was lying at the foot of her bed with a cold muzzle on her dry skin, instead of more chemo running down her veins--that's what she did.

An instant, sensual and aesthetic satisfaction that is rewarded for mere presence.

Much of it comes down to loving our time through our senses, through our bodies, through the very act of the living and the dying.

Perhaps the most inspiring room in the Zen Hospice Guest House is our kitchen. It's a bit strange considering so many residents have no or very little to eat.

However, we are aware that they provide nourishment on several levels, such as odor and symbolic aspects.

Seriously, with so much going on under the roof, one of the most proven interventions we know of is baking cookies.

As long as we have a sense, even if it's just one, we at least have a chance of accessing something that makes us feel human and connected.

Imagine the repercussions this concept will have for the millions of people living and dying with dementia.

We don't need the joy of primitive sensations to express what we can't put into words, the urge to keep us in the present: the past or the future.

So if removing unnecessary suffering from a system is our first design cue, the tendency to preserve dignity through the senses and the body, the aesthetic realm, is our second cue.

Now let's jump right into the third and final part of today. That means we need to lift our eyes and look to happiness. Then life, health and healthcare can be made not just less horrible, but more wonderful.

charitable.

Here, this pinpoints the distinction between disease-centered models of care and patient- or person-centered models of care, where care becomes a creative, generative, even playful act.

"Playing" may sound like a funny word.

But it is also one of our most advanced forms of adaptation.

Consider every major compulsory effort necessary to be human.

The need for food gave birth to cooking.

The need for shelter gave rise to architecture.

Need for cover or fashion.

And to follow the clock, we invented music.

So what can we derive from this fact, since dying is a necessary part of life?

By "playing", I am in no way suggesting that we take a light-hearted approach to death, or that we are forced to die in a particular way.

There is an unmovable mountain of grief, and one way or another we will kneel there.

Rather, what we seek is to create a space, a physical and mental room, in which life can continue to play naturally. That way, old age and death can become a process that crescendos to the end, rather than just letting it get out of the way.

Death cannot be the solution.

I'm sure some of you are working on this.

(Laughter) In the meantime, we can -- (Laughter) design for it.

Part of me died early, and that's what everyone can say in one way or another.

I had to redesign my life around this fact. And, like a snowball that lasts for just one perfect moment and melts all the while, let me tell you that I am liberated by the realization that I can always find the beauty and the impact of meaning in the rest of my life.

If we madly love such moments, perhaps we can learn to live well because of death, not in spite of it.

Let death be what takes us, not lack of imagination.

thank you.

(applause)

What I want to do is talk a little bit about fear and the price of fear and the times of fear we are now emerging from.

I want you to feel comfortable doing such things knowing that I know something about fear and anxiety.

I am Jewish from New Jersey.

(Laughs) I was worried even before I started walking.

(Laughter) Please give me a round of applause.

(Applause.) Thank you.

But I also grew up in a time when there was something to fear.

When I was little, we were brought out into the halls and taught how to pull a coat over our heads to protect ourselves from global thermonuclear warfare.

By now, even my 7-year-old brain knew it wouldn't work.

But I also knew that a global thermonuclear war was something to worry about.

But despite the fact that we have been living with the threat of such wars for 50 years, the response of our governments and societies has been to do great things.

We created the space program in response.

We built the highway system in response.

We created the Internet in response.

Therefore, fear can also generate constructive reactions.

However, in some cases it can lead to non-constructive reactions.

On September 11, 2001, 19 men hijacked four planes and crashed them into several buildings.

They made terrible sacrifices.

We cannot minimize that sacrifice.

But the response we got was clearly disproportionate, almost to the point of instability.

We have reorganized the national security apparatus of the United States and many governments to deal with threats that were very limited at the time these attacks took place.

In fact, according to our intelligence agencies, on September 11, 2001, there were 100 core al-Qaeda members.

The number of terrorists was only a few thousand.

They were no existential threat to anyone.

But we have reorganized the entire national security apparatus in the most radical way since the end of World War II.

We started two wars.

We have spent trillions of dollars.

We suspended our values.

We violated international law.

We accepted torture.

We embraced the idea that if these 19 people can do this, so can anyone else.

So for the first time in history we saw everyone as a threat.

And what were the results?

Surveillance programs tapped emails and phone calls of hundreds of millions of people across nations, regardless of whether those countries were our allies or not, regardless of what our interests were.

Now, 15 years later, the number of terrorists, the number of terrorist attacks, and the number of victims of terrorism are still higher, according to the U.S. State Department tally, and I would argue that today the areas where those attacks occur are more unstable than at any time in history, perhaps since the floods, and we are probably not responding successfully.

Now I have to ask where did I go wrong.

what did we do What was wrong?

And you might say Washington is a dysfunctional place.

There are also political food fights.

We turned the discussion into a cage match.

That's true.

But believe it or not, there's a bigger problem than that malfunction. The dysfunction that makes it impossible to accomplish anything in the richest and most powerful country in the world, I would argue, is far more dangerous than what groups like ISIS can do, because it stops us in our steps and hinders our progress.

But there are other problems as well.

And other problems stem from the fact that Washington and many other capitals are currently experiencing a crisis of creativity.

In Washington think tanks, people are supposed to come up with new ideas, but they don't get bold new ideas. Because if you propose a bold new idea, you will not only be attacked on Twitter, but you will not be allowed to work in the government.

We are reacting to the growing poison of political debate, so governments have an us vs. them mindset, and fewer people make decisions.

What do you get when you sit in a room with a small group of people making decisions?

It becomes groupthink.

Everyone has the same worldview, and views from outside the group are seen as a threat.

It's dangerous.

There is also a process that reacts to the news cycle.

So the forward-thinking, forward-looking, strategizing parts of the US government that do this in other governments just can't. Because they are reacting to the news cycle.

So we are not thinking ahead.

On 9/11 we were in trouble because we were looking in the wrong direction.

Today, we are in danger because 9/11 has us still looking in the wrong direction, and because we know there are far more significant transformative trends on the horizon than what we saw on 9/11. Much more important than the threat posed by these terrorists. That is far more important than the instability in some parts of the world that are in a state of instability today.

In fact, what we are seeing in these parts of the world can be symptoms.

They can be reactions to larger trends.

And if we treat the symptoms and ignore the bigger trends, we have a much bigger problem to deal with.

So what are these trends?

Well, for groups like yours, the trend is clear.

We are living in a moment when the very fabric of human society is being rewoven.

I saw the cover of The Economist a few days ago and it said that by 2020, 80% of the people on earth will own a smartphone.

They had small computers in their pockets that were connected to the Internet.

Mobile phone penetration is 80 percent in most parts of Africa.

We passed the point last October when there were more mobile phone devices (SIM cards) than people in the world.

We are approaching a pivotal moment in history within a few years when virtually every human being on Earth will be part of an artificial system for the first time and will be touchable by anyone else, for better or for worse.

And the changes associated with it are changing the very nature of every aspect of governance and life on Earth in ways our leaders should think about these imminent threats.

On the security side, we got out of the Cold War when it was too costly to fight a nuclear war, and we didn't get to what I call the Cold War, the Cyber ​​War, where the cost of conflict is actually so low that we may never be able to stop it.

We may enter an age of constant warfare, and we know it because we have been in it for several years.

But we have no underlying doctrine to guide us in this regard.

No basic concept has been formulated.

If someone attacks us with a cyberattack, do we have the ability to respond with a dynamic attack?

I do not understand.

If someone launches a cyberattack, how do you stop it?

What did the US government do when China launched a series of cyberattacks?

It said they were going to prosecute several Chinese who never came to America.

They will never go near the law enforcement officers who detain them.

It's a gesture, not a deterrent.

Today, Special Forces operators out in the field have discovered that a handful of rebels with cell phones have access to satellite imagery once only possessed by superpowers.

In fact, having a mobile phone gives you access to powers that superpowers lacked, and ten years ago would have been top secret.

I have an app on my phone that tells me where all the planes in the world are, their altitude, speed, type of plane, where they're heading and where they're landing.

They have an app that lets them know what their enemies are trying to do.

They are using these tools in new ways.

When a cafe in Sydney was occupied by terrorists, he broke in with a rifle...

And an iPad.

And the murder weapon was an iPad.

Because he grabbed people, scare people, pointed iPads at people, took videos and put them on the Internet, and controlled the world's media.

But it doesn't just affect security aspects.

Great Power Relations -- We thought the bipolar era was over.

We thought we were in a unipolar world where all the big problems were solved.

Remember? It was the end of history.

But we are not.

We are now realizing that our basic assumption about the Internet, that it is what brings us together and brings society together, is not necessarily true.

Countries like China have the Great Firewall of China.

Some countries say no. If the Internet originates within our borders, we manage it within our borders.

We control content. We will manage security.

We are going to manage that internet.

I will tell you what you can do there.

I'm going to set another rule.

Now, you might think, it's just China.

But it's not just China.

China, India, Russia.

Saudi Arabia, Singapore, Brazil.

After the NSA scandal, Russians, Chinese, Indians and Brazilians said let's build a new internet backbone because we can't rely on another internet backbone.

So suddenly what do you have?

We are entering a new bipolar world where our belief in cyber internationalism is being challenged by another belief, cyber nationalism.

We see these changes everywhere we look.

We are witnessing the arrival of mobile money.

It's happening in unexpected places.

This is also happening in Kenya and Tanzania, where millions of people who previously had no access to financial services now do it all on their mobile phones.

There are 2.5 million people without access to financial services that will soon be available.

1 billion of them will soon have mobile access.

It doesn't just give them the ability to bank.

It will change the way monetary policy is conducted.

Money will change.

Education is changing as well.

Medicine is changing as well.

The way government services are delivered is changing as well.

Nonetheless, Washington debates whether the terrorist group that has occupied Syria and Iraq should be called ISIS, ISIL, or the Islamic State.

We are trying to decide how much to compromise in negotiating a nuclear deal with Iran that deals with 50-year-old technology, but in fact we know that Iran is currently waging a cyberwar with us, but partly because companies are reluctant to talk about attacks being waged against Iran, we ignore it.

And that leads us to another collapse that is decisive for groups like this, and another that is even more important. Because everything that drove America's growth and indeed America's national security, and progress even during the Cold War, was a public-private partnership between science, technology, and government that began when Thomas Jefferson was sitting alone in his lab inventing new things.

But it was canals and railroads and telegraphs. It was radar and the internet.

It was the breakfast drink, Tan. It was perhaps the least significant of these developments.

But what you had was partnership and dialogue, and that dialogue fell apart.

The issue is bankrupt in Washington because less government is considered more important.

Believe it or not, there is a war on science in Washington that is collapsing. Despite the fact that throughout human history, science has won every time someone has waged war against it.

(Applause.) But our government won't listen and we don't have people at the highest level who understand this.

In the nuclear age, there were people in senior national security positions who were expected to speak out.

They were expected to know technical terms and vocabulary.

If you go to the highest levels of the U.S. government now and say, "Talk about cyber, talk about neuroscience, talk about changing the world tomorrow," you'll get a blank stare.

I understand that. Because when I wrote this book, I spoke with 150 people, many of whom were tech people, and they felt like they were being relegated to their children's table.

On the other hand, on the technology side, there are a lot of great people building great things, but they started in garages and didn't need or want a government.

Many of them hold political views somewhere between libertarian and anarchic. "Leave me alone".

But the world is crumbling.

Suddenly, there will be massive regulatory changes that will create massive conflict-related issues and massive security and privacy issues.

And we have not even reached the next set of questions - philosophical ones.

If you can't vote, if you can't get a job, if you can't bank, if you can't get health care without Internet access, if you can't get an education without Internet access, is Internet access a fundamental right that should be enshrined in the Constitution?

If access to the Internet is a fundamental right, is access to electricity for the 1.2 billion people without electricity also a fundamental right?

These are basic issues. where are the philosophers?

where is the dialogue?

And that leads me to why I am here.

i live in washington what a shame.

(Laughter) There is no dialogue going on there.

These big problems that change the world, change national security, change the economy, create hope, and create threats can only be solved by reuniting groups of people who understand science and technology with governments.

Both sides need each other.

And until we rebuild that connection, we will be even more vulnerable unless we do things that help America grow and help other countries grow.

The risks associated with 9/11 may not be measured in terms of lives lost, buildings destroyed, or trillions of dollars spent in terrorist attacks.

They will be assessed in terms of the cost of our inability to distract ourselves from important issues, to bring scientists, engineers, and government leaders together at a moment of change akin to the beginning of the Renaissance, the beginning of a period of great change that has taken place on Earth, to at least come up with the right questions, if not the right answers.

We're not quite there yet, but discussions like this and groups like yours are places where these questions can be formulated and raised.

That's why I believe groups like TED, discussions like this on Earth, are where the future of foreign policy, economic policy, social policy, and philosophy will ultimately take place.

That's why I really enjoyed talking with you.

thanks so much.

(applause)

Billie Jean King: Hello everyone!

(Applause.) Thank you, Pat.

thank you!

Now it's over!

(laughs) Pat Mitchell: Good!

When you watched the match video again, you must have felt that the fate of the women of the world depended on every stroke you hit.

Did you feel that way?

BJK: First of all, Bobby Riggs. By the way, he was a former number one player and not just a hacker.

He was one of my heroes and I looked up to him.

That's why I beat him, in fact, because I respected him.

(Laughter) It's true. My mother, especially my father, always said this. "Respect others, never underestimate them."

And he was right. he was completely right.

But I knew it was about social change.

And every time I put it out I was really nervous and it felt like the whole world was on my shoulders.

And I thought, 'If I lose, women will at least go back 50 years.

Title IX had just passed the previous year, June 23, 1972.

And women's professional tennis -- there were nine players who signed $1 deals in 1970 -- remember, the game was in '73.

So it was only three years into a tour where I could actually play, compete and make a living.

So there were nine people who signed that $1 deal.

And our dream was that no matter where in the world a girl was born, if she was good enough, she would have a place to compete and for us to make a living.

Because before 1968, we were making $14 a day and we were under organizational control.

So we really wanted to get out of there.

But we knew it wasn't really about our generation. I knew it was about future generations.

There is no question that we stand on the shoulders of our predecessors.

But every generation has a chance to improve it.

That really bothered me.

I really wanted to start putting my heart and soul into Title IX.

Title IX, which many of you probably don't know, but for those who don't, says that federal funds given to high schools, colleges and universities, public or private, must ultimately be distributed equally to boys and girls.

And that changed everything.

(Applause.) There may be laws, but that means changing people's minds to fit them.

It's a really great time, totally.

So that was on my mind.

I wanted to initiate that change in my heart and spirit.

But I learned two things from that match.

For women: confidence, empowerment.

In fact, they were brave enough to ask for a raise.

Some women have waited 10, 15 years before asking.

I said, "What's more important, do you understand?"

(Laughter) And they did!

And for men?

Many men today don't realize it, but if you're in your 50s, 60s, etc., or in your late 40s, you're the first generation of men in the women's movement, whether you like it or not.

(Laughter) (Applause) And for the men, what happened to the men, they came to me. And most of the time it was men with tears in their eyes. This is very interesting.

They said, 'Billy, I was so young when I saw that game, and now I have a daughter.

And I'm so glad I got to see it at a young age. ”

And one of those young people was 12 and was President Obama.

And in fact, he said when he met me, "You may not realize it, but I saw the game at 12.

And now that I have two daughters, it has changed the way I raise them. ”

That is, both men and women could get a lot out of it, but in different ways.

PM: And now there is at least one or two generations who have experienced the equality made possible by Title IX and other battles.

And in the case of women, there is a generation that has experienced teamwork.

They can now play team sports like never before.

So you already had a built-up legacy in terms of being an athlete, a legacy of lobbying efforts for equal pay for female athletes and women's sports foundations.

What are you currently hoping to achieve with the Billie Jean King Leadership Initiative?

BJK: I think it goes back to an epiphany I had when I was 12 years old.

At 11, I wanted to be the number one tennis player in the world, and a friend invited me to play tennis, and I said, "What's that?"

There was no tennis in my family. Basketball was another sport.

Fast forward to being 12 years old (laughs), and I'm finally starting to participate in tournaments where I can get a ranking at the end of the year.

So I was daydreaming at the Los Angeles Tennis Club and I started thinking about my sport and how small it was, but I also started thinking about everyone playing with white shoes, wearing white clothes and playing with a white ball, meaning everyone playing was white.

And I said to my 12-year-old self, "Where is everyone?"

And it stuck in my mind.

And in that moment, I made a vow to spend the rest of my life fighting for equal rights and opportunities for boys and girls, men and women.

And in that tennis, if I'm lucky enough to be number one, and I'm a woman, and I knew it would be hard to be an influence already at that age, I have this platform.

And tennis is global.

And so I thought.

I was given opportunities that most people didn't get. ”

I didn't know if I would pass. I was only 12 years old.

I certainly wanted one, but making it is another story.

I only remember the promises I made to myself, and I always try to keep my promises.

That's who I really am, just fighting for the people.

And unfortunately, women don't get that much.

And we are considered inferior.

So where did my attention need to go?

It just... has to be.

And learn to protect yourself and listen to yourself.

I keep hearing the same words coming out all the time, but I've been really lucky because I've been educated.

And if you can see it, I think you can be it too, you know?

If you can see it, you can be it too.

Look at Pat, look at other leaders, look at speakers, look at yourself. Because anyone, everyone can achieve something extraordinary.

One person one person.

PM: And Billy, your story has inspired many women around the world.

The Billie Jean King Leadership Initiative is committed to an even greater purpose.

Because what we hear so often is that women are raising their voices and striving for leadership positions.

But what you are talking about is even bigger than that.

It is inclusive leadership.

And this is the generation that grew up with more inclusive thinking -- BJK: Isn't that great? Look at the technology!

It's amazing how it brings us all together! It's about connection.

What is possible with it is simply amazing.

But the Billie Jean King Leadership Initiative is really mostly about the workforce, trying to transform the workforce so that people can actually go to work and be themselves.

Because most of us have two jobs. One is to match the surroundings. Let me give you a perfect example.

African-American women wake up an hour early to go to work, get their hair done in the bathroom, go to the bathroom maybe 4, 5, 6 times a day, keep their hair done, keep checking to see if they fit.

So she has two jobs.

She has a different job, but is trying to adapt to whatever it is.

Or this poor man who kept his diploma--he went to the University of Michigan and never talked about his poverty as a young man--just didn't mention it.

So he made sure they understood that he was well educated.

And then there are gay men who have the NFL. That means American football for everyone out there. It's a big deal and very macho. And because he was gay and didn't want anyone to know, he was always talking about football.

It goes on and on.

So my ultimate wish for all of you is to be who you are 24/7.

And we catch ourselves—I mean, I catch myself to this day.

Even though I'm gay, I'm aware of myself: I feel like I'm (gasping) a little uncomfortable, a little gut-rising, and not entirely comfortable in my own skin.

So I think we need to ask ourselves. I want people to be themselves, and I want them to be whatever they are.

PM: And the initial research done by the Leadership Initiative showed from these examples you just gave that many of us have a problem with authenticity.

But what you're seeing now is this millennial generation who has benefited from all these equal opportunities. It may not be equal, but it exists everywhere. BJK: First of all, I'm really lucky.

Partnering with Teneo is a great strategic company.

Really that's why I can do this.

There have been two times in my life when I've had men with real power behind me.

It was a long time ago with Philip Morris and Virginia Slims, but this is the second time in my life.

Then Deloitte.

What I wanted was data, facts.

So Deloitte conducted a survey, and now more than 4,000 people have responded, and we continue to be active in our workplaces.

And what are millennials feeling?

Well, they feel a lot of things, but what makes them so great, you know, our generation was like, 'Oh, we're going to get a representative.

So when you walk into the room you will see that everyone is represented.

That's not enough anymore, it's so good!

So millennials are great. They want connection and engagement.

They just want you to tell us what you're feeling and what you're thinking and find a solution.

Compared to when I was a kid, they are much better problem solvers and of course have more information at their fingertips.

PM: What did the survey tell us about millennials?

Will they make a difference?

Are they really going to create a world with an inclusive workforce?

BJK: Well, by 2025, 75 percent of the global workforce will be millennials.

I think they will help solve the problem.

I think they are capable of doing just that.

I know they care a lot.

They have big ideas and can make big things happen.

I want to stay in the present with young people, I don't want to fall behind.

(laughs) PM: I don't think I have a chance!

But what our millennial research finds is not really what most people experience with millennials.

BJK: No, well, if you want to talk -- okay, I'm doing a little mini-research.

I was talking to Boomer bosses and asked, "What do you think about millennials?"

And I'm pretty excited, that's a good thing, and they look like — (laughter) "Oh, is it about the 'me' generation?"

(laughs) "Do you really think so?"

Because I think they care about the environment and everything else. ”

And they say, "Oh, Billy, I can't concentrate."

(Laughter) They actually proved that the average attention span of an 18-year-old is 37 seconds.

(Laughter) They can't concentrate.

And they don't really care.

I just heard a story the other day. A woman runs a gallery and she has these employees.

She got a text message from one of her intern-like employees who had just started working and said, "Oh, by the way, I'm going to be late because I'm at the hairdresser."

(Laughter) So when she arrived, her boss said, "What's going on?"

And she said, "Oh, I'm sorry I'm late. How was it?"

She said, "Well, what do you think? I want you to go home. It's over."

“Okay,” she said.

(laughs) No problem!

PM: Well, Billy, I know the story, but that's what scares baby boomers - I'm just telling you - so I think it's good that we share.

(Laughter) No, it's good to share. Because we are who we really are and what we really feel. So we have to take it both ways.

But I have great faith. Because if you're into sports like I am, you get better with each generation.

It's true.

The Women's Sports Foundation is still a Title IX proponent, but we're trying to stay abiding by the law, and the law is always in a precarious position, so we're really concerned and doing a lot of research.

It's very important to us.

And I want to hear people's opinions.

But we really have to defend what Title IX stands for all over the world.

And I heard President Carter talking about how Title IX is protected.

And did you know that, at least in the world of sports, every lawsuit filed by girls wins, no matter what the organization?

Title IX is here to protect us.

And it's amazing.

But we still need to win hearts and minds. The heart and spirit to fit the bill is enormous.

PM: So what do you get up to every morning?

What makes you keep your job, keep fighting for equality, keep expanding it, always looking to explore new territories, find new ways...?

BJK: Well, I always pissed off my parents because I was always curious.

I am very motivated.

My brother was a major league baseball player.

My poor parents didn't care if we were good or not.

(Laughter) And we drove them crazy because we wanted to be the best and we pushed.

I think it's because of what I heard in a TED talk today.

I'm going to listen to these different women, listen to different people, and listen to President Carter. By the way, I'm 90 and he gave me numbers I could never put out. I had to say, "Excuse me, wait a minute, I need to get a list of these numbers."

he was rattling. I mean, that's awesome, sorry.

Prime Minister: He's a wonderful person.

(Applause) BJK: And then we have former President Mary Robinson -- thank you Irish! 62 percent! LGBTQ! Yes!

(Applause.) Congress will vote on same-sex marriage in June, so these things are very hard to hear for some people.

But always remember that each of us is an individual, a human being with a beating heart, who cares about his own life and wants to live it.

OK? You don't have to agree with anyone, but everyone has the opportunity to do so.

I think we all have an obligation to keep the needle moving forward.

And these people have been so inspirational.

Everyone matters.

And all of you are influencers.

You out there listening, people around the world, and people here, everyone is an influencer.

Never forget it. OK?

So never give up on yourself.

PM: Billy, you have inspired us.

BJK: Thanks Pat!

(Applause.) Thank you, TED!

(Applause.) Thank you very much!

Over the past 50 years, many smart and resourceful people, I'm sure some of you are, have tried to find ways to reduce poverty in America.

People have founded and invested millions of dollars in nonprofits with a mission to help the poor.

They have founded think tanks that study issues such as education, job creation and wealth building, and have advocated policies to help the most marginalized communities.

They write books and columns, give impassioned speeches, and denounce the gap between the rich and the poor that is settling more and more people at the bottom of the income spectrum.

And the effort paid off.

But that's not enough.

Since the war on poverty began, our poverty rates have not changed much in the last 50 years.

My point here is that we are overlooking our most powerful and practical resource.

It's the poor.

In the left corner are Jovana, Cintia, and Bertha.

The two met through a parenting class at the Family Resource Center in San Francisco when they had young children.

As they grew up together as parents and friends, they often talked about how hard it was to make money when their children were little.

Raising a child costs money, more than you earn at work.

Their husband was working but wanted to contribute financially as well.

So they made a plan.

They started a cleaning business.

They put up flyers in their neighborhoods and gave out business cards to family and friends, and customers soon started calling.

Two of them cleaned the office and house, and one took care of the children.

We took turns as to who cleaned and who looked after the children.

(laughs) Isn't that great?

(Laughter) And they split the money three ways.

It wasn't a full-time gig, so no one could watch the little ones all day.

But it made a difference in their family.

Money to pay additional bills if the husband's working hours are reduced.

Money to buy children's clothes according to their growth.

Put a little extra money in their pocket and make them feel a certain amount of independence.

In the upper right corner are Teresa and her daughter Brianna.

Briana is one of those kids who is sparkling, easy to get along with, and has a sociable personality.

For example, when Rosie, a girl who only speaks Spanish, moved in next door, Briana, who only speaks English, borrowed her mother's tablet and found a translation app so they could communicate.

(laughs) You know what?

Rosie's family credits Briana with helping Rosie learn English.

A few years ago, Briana started struggling with schoolwork.

She became irritable, withdrawn, and violent in class.

And her mother was heartbroken by what had happened.

Then Brianna was devastated to find out she had to repeat her sophomore year.

Her mother felt hopeless, devastated and alone because she knew her daughter was not getting the support she needed and did not know how to help her.

One afternoon, Teresa was approached by a group of friends, and one of them said, "How are you doing, Teresa?"

and she cried.

After she shared her story, one friend said, "I went through exactly the same thing with my son about a year ago."

And in that moment Teresa realized that a lot of her struggles were with not having anyone to talk to about it.

So she started a support group for like-minded parents.

She and two others were the first to meet.

But word spread, and soon 20 or 30 people were attending her monthly meetings.

Although she felt helpless, she realized that with the support of others going through the same suffering, she could support her daughter.

And Brianna is doing great. He has excellent grades both academically and socially.

In the middle is my man Barkill, standing in front of Blackstar Books and Cafe, which he rents out of his house.

As you enter the door, Baakir greets you with "Welcome to the Black House."

(Laughs) Once inside, you can order the Algiers jerk chicken, perhaps the vegan walnut burger, or the jive turkey samich.

It's a sumich, not a sandwich.

Top off your meal with buttermilk drops made from a family secret recipe a few steps above the donut hole.

Actually, it's so secret that he won't tell you about it.

But BlackStar is more than just a cafe.

For the neighborhood kids, it's a place to get help with their homework after school.

For adults, this is the place to go to find out what's happening in your neighborhood or catch up with friends.

Performance venue.

It is the home of poets, musicians and artists.

With a baby girl on her back, Barkill and her partner Nicole are serving coffee, teaching kids how to play Mancala and painting signs for upcoming community events.

For over 20 years, I have worked with and learned from people just like them.

I organized an organization against the prison system that is affecting the poor, especially Black, Indigenous, and Latino people at an alarming rate.

I have worked with young people affected by racist disciplinary practices in schools and police violence in their communities, yet showing hope and promise.

I learned from families who used ingenuity and tenacity to collectively create their own solutions.

And they're not just focused on money.

They work on things we all care about: education, housing, health, community.

Everywhere I go, I see people who are broken but not broken.

I see people struggling to bring their good ideas to life in order to build a better life for themselves, their families and their communities.

Giovana, Cintia, Bertha, Teresa, and Barkill are common, not the glorious exceptions.

I am an exception.

I was raised in Rochester, NY by a quiet, fierce single mother.

I bused him to a suburban school from an area many of my classmates and their parents considered unsafe.

At eight years old, I was a latchkey kid.

Every day after school, I would go home, do my homework, and wait for my mother to come home.

After school, I used to go to the corner store and buy a can of Chef Boyadie's ravioli, heat it up on the stove and eat it as an afternoon snack.

If I had a little extra money, I'd buy a Hostess Fruit Pie.

(laughs) Cherry.

Not as good as buttermilk drops.

(Laughter) When I was a kid, my family was poor.

But now I own a home in the rapidly gentrifying neighborhood of Oakland, CA.

I have built a career.

My husband is a business owner.

I have a retirement account.

My daughter is not even allowed to turn on the stove unless there is an adult in the house, nor does she need to. Because she doesn't need to be as independent as I am at this age.

My kids' ravioli are organic and loaded with spinach, ricotta cheese, and more. Because I am free to choose what my children eat.

I am the exception not because I am more talented than Barkill, or because my mother worked harder than Giovana, Cintia, and Berta, or cared more than Teresa.

Marginalized communities are filled with smart, talented people who are just as hard-working and innovating as our most respected and most paid CEOs.

It's filled with people who use their resilience to get up every day, send their kids to school, get jobs that don't pay enough, or get an education that puts them in debt.

There are plenty of people out there who use their clever minds to raise the minimum wage or make a living by balancing work and side hustle.

It's full of people doing things for themselves and others, like buying medicine for the elderly neighbors, borrowing money from siblings to pay their phone bills, or just bending over to watch the kids in the neighborhood.

My exception is not due to hard work, but due to luck and privilege.

I am neither humble nor self-deprecating. I'm great

(laughs) But most people work hard.

The common denominator of this equation is hard work. I'm tired of the stories that hard work leads to success. Because it is possible -- thanks.

(Applause.) ...because this story allows those of us who have succeeded to believe that we deserve it, and implicitly makes us believe that those who have not succeeded do not deserve it.

We say to ourselves in the back of our minds, sometimes in our mouths, that there must be something wrong with those poor people.

We have a wide range of beliefs about what is wrong.

Some tell stories that the poor are idle freeloads, cheating and lying to get away from an honest day's work.

Some like the story that poor people are helpless, perhaps because of negligent parents who haven't read enough, if they just tell them what to do and point them in the right direction, they can get by.

Every time I hear stories demonizing low-income single mothers and absentee fathers (as people might think of my parents), I have 50 stories telling another story about the same people who show up every day and do their best.

That's not to say that some of the negative stories aren't true, but they don't paint the full picture, which obscures the true picture of people.

Quarterly truths and limited plotlines convince us that poor people are a problem that needs to be solved.

What if we realized that it's the people that work and our approach that's broken?

What if we find that the professionals we look for, the professionals we need to follow, are themselves poor people?

What if, instead of imposing a solution, they added fire to the already burning flames?

It doesn't dictate, it doesn't empower, it just stimulates their initiative.

Just north of here is an example of how this would look. Silicon Valley.

The entire venture capital industry has grown around the belief that if people have a good idea and a desire to bring it to life, we should give them a lot of money.

(laughs) Right? But where is our strategy against Teresa and Barkill?

No incubators, no accelerators, no fellowships for them.

How are Giovana, Cintia and Berta really different from the Mark Zuckerberg of the world?

Baakir has the experience and the track record.

I would throw money at him.

So consider this an invitation to rethink your flawed strategy.

Let us seize this opportunity to let go of the weary false narratives and listen to and seek out the truer, more beautiful and complex narratives of who marginalized people, families and communities are.

I will take some time to talk to the people.

I can't wait for someone to fix it properly.

Let's remember what we can do. All that we have built with blood and sweat and dreams. All the gears that keep turning. People survived because of our hard work.

Let's remember we are magic.

If you need some memory-boosting inspiration, read Octavia Butler's Parable of the Sower.

Listen to "Letters from Birmingham Jail" by Dr. King.

Hear Suhair Hamad recite "First Writing Because" or Esperanza Spalding perform "Black Gold."

Check out the art of Kehinde Wiley and Fabiana Rodriguez.

Look at your grandmother's hands, or the eyes of someone who loves you.

we are magic

Individually we don't have much wealth or power, but collectively we are unstoppable.

And we spend a lot of time and energy organizing powers to demand change in systems that weren't built for us.

Instead of trying to modify fabrics of existing methods, weave and cut powerful new fabrics.

Let us use some of our substantial collective power to invent and bring to life new ways of living that are beneficial to us.

Desmond Tutu discusses the concept of ubuntu in relation to the truth and reconciliation process South Africa embarked on after apartheid.

It means, "My humanity is entwined and inextricably linked to yours. We belong to the bundle of life," he says.

bundle of life.

The process of truth and reconciliation began with raising the voices of those who had never heard.

If this country is to live up to its promise of liberty and justice for all, it must raise the voices of people like Giovana, Cynthia, Berta, Teresa and Barkill who are not heard.

We need to leverage their solutions and ideas.

We must listen to their true stories, their more beautiful and complex stories.

thank you.

(applause)

I am here to recruit men to support gender equality.

(cheers) Wait, wait. what?

What does men have to do with gender equality?

Gender equality means women, right?

So the word gender refers to women.

In fact, I'm speaking here as a middle-class white male.

Now, I wasn't always a middle-class white man.

It all happened about 30 years ago when I was in graduate school. A few of us graduate students got together one day and said there was an explosion of writing and thinking about feminist theory, but no courses yet.

So we did what grad students normally do in those situations.

We said, "Okay, let's have a study group."

Read the text, talk about it, have a potluck dinner.

(Laughter.) So every week, 11 women and I got together.

(Laughter) We read a piece of feminist theory and we talked about it.

And during our conversation, I witnessed an exchange that changed my life forever.

It was a conversation between two women.

One of the women was white and the other black.

And the white woman said – it sounds very anachronistic now – but the white woman said, “All women face the same oppression as women.

All women are similarly placed in the patriarchy, and therefore all women have a kind of intuitive sense of solidarity and sisterhood. ”

The black woman then said, "I don't know.

Let me questions. "

So the black woman said to the white woman, "When you wake up in the morning and look in the mirror, what do you see?"

Then the white woman said, "I see a woman."

The black woman then said, 'Look, that's my problem.

Because when I wake up in the morning and look in the mirror, I see a black woman.

Race is visible to me. But race is invisible to you. you can't see it ”

Then she said something really amazing.

"That's what privilege is," she said.

Privilege is invisible to those who have it. ”

To the white people sitting in this room, it's a luxury not to have to think about race every minute of your life.

Privilege is invisible to those who have it.

Now, remember, I was the only male in this group, so when I witnessed this, I was like, 'Oh no.

(Laughter.) And someone said, "So what was that reaction?"

And I said, 'When you wake up in the morning and look in the mirror, you see a human being.

I'm more of an ordinary person.

As you know, I am a middle class white male. I have no race, no class, no gender.

I can generalize universally. ”

(Laughter.) So I like to think that was the moment I became a middle-class white man, and that class, race, and gender were about me, not about other people.

I had to start thinking about them, but it was a privilege that kept me invisible for so long.

Well, I want to tell you that this story ended in that little discussion group 30 years ago, but I was just recently reminded of it at the university where I teach.

I have a colleague and she and I both teach a course on gender sociology every other semester.

So she gives guest lectures when I teach.

When she teaches, I give guest lectures for her.

So I entered her class to give a guest lecture. There were about 300 students in that room, and when I walked in, one of them looked up and said, "Ah, finally an objective opinion."

During that semester, every time my colleague opened his mouth, the students saw a woman.

I mean, if you said to my students, ``There is structural gender inequality in America,'' they would say, ``Of course you would.

you are a woman you are prejudiced ”

When I say it, they say, "Huh, is that funny?"

Will it be tested? How do you spell "structural"? ”

(Laughter) As you can see, this is what objectivity looks like.

(Laughter) (Applause) Western rationality without substance.

(Laughs) By the way, I think this is why men often wear ties.

(Laughter.) Because if you want to embody disembodied Western rationality, you need a signifier. And what better representation of disembodied Western rationality than a garment with a rope on one end and a genital point on the other?

(Laughter) (Applause) That's exactly the mind-body dualism.

Therefore, making gender visible to men is the first step towards engaging men in advocating for gender equality.

Now, when men first hear about gender equality, when they first start thinking about it, many men often think, yes, that's fair, that's justice, that's an ethical obligation.

But not all men.

Some men think that when the lightning bolt falls, they'll immediately start mansplaining your oppression if you say, "Oh my God, yes, gender equality."

They see advocating for gender equality as a kind of cavalry. It's like, "Thanks for bringing this to our attention, ladies, we'll work from here."

The result is a syndrome I like to call "premature complacency." (Laughter) (Applause) But there is another group that actively resists gender equality and sees it as harmful to men.

I was on a TV talk show with four white guys.

This is the beginning of the book I wrote, Angry White People. These were four white men angry because they believed themselves, white men in America, to be victims of reverse discrimination at work.

And they all told stories about how they were really angry that they had qualified for jobs and promotions and didn't get them.

And the reason I say this is because I want you to hear the title of this particular show.

It was one man's words, "A black woman stole my job."

And they all told stories about themselves who were eligible for jobs, who were eligible for promotions, who didn't understand, who were really angry.

And then when it was my turn, I said, "I just have one question for you guys. It's about the title of the show, 'A Black Woman Stole My Job.'" It's actually about the title line.

I would like to know about the word "my". Where did you get the idea that it was your job?

Why isn't the show titled "A Black Woman Got the Job"? Because I don't think you can understand why so many men are resisting gender equality without facing men's sense of entitlement.

(Applause.) Look, we think this is a level playing field, so any policy that tilts it even a little bit, I think, "Oh my God, the water is rushing uphill."

It's reverse discrimination against us. ”

(Laughter) So let me be clear, white men in Europe and America are the beneficiaries of the single largest affirmative action program in the history of the world.

It is called "History of the World".

(Laughter) (Applause) Now that we've identified some barriers to male engagement, why should we stand for gender equality?

Of course it is fair, just and fair.

But more than that, gender equality is also our concern as men.

If you listen to what men say about what they want out of life, gender equality is really a way to get the life we ​​want.

Gender equality is good for the country.

Most studies find that the countries with the most gender equality are also the countries that score the highest on measures of well-being.

It's not just because they're all in Europe.

(Laughter) In Europe, the countries with the most gender equality are the happiest.

It's also good for businesses.

Research from Catalyst and others conclusively shows that the more gender equal a company is, the better it is for workers and the happier the workforce.

They have a low turnover rate. They have low wear and tear.

they are easy to recruit.

They have higher retention rates, higher job satisfaction, and higher productivity.

A question I get asked a lot in business is, "Isn't gender equality really expensive?"

And I say, "No, really, what you have to count is how much gender inequality has already hurt you.

Very expensive. ”

That's why it's good for business.

And the other is good for men too.

This is good for the kind of life we ​​want to live. Because young men are making a particularly big shift and want to live a vibrant life with a great relationship with their children.

They expect their partners, spouses and wives to work outside the home and be as committed to their careers as they are.

Some of you may remember this as I spoke to explain this change.

There was a mystery thrown at us when I was much younger.

The memory of this riddle may make some people flinch.

The mystery went something like this.

A man and his son were driving on a highway in a terrible accident, the father died and the son was taken to the hospital emergency room. When he was taking his son to the hospital emergency room, the emergency room doctor looked at the boy and said, "Oh, he can't be treated, that's my son."

How is this possible?

This puzzled us.

We didn't understand this.

(Laughter) Well, I decided to do a little experiment with my 16-year-old son.

Recently, he was watching a TV game at home with many friends.

So I posed this riddle to them to gauge the level of change.

Well, sixteen-year-old boys, they immediately turned to me and said, "It's his mom." right?

no problem. That's exactly right.

Except for his son, he said, "He may have two fathers."

(Laughter) (Applause) This is an indicator, an indicator of how things have changed.

Young men today expect to be able to balance work and home.

They want to be a dual-career, dual-care couple.

They want to balance work and family with their partner.

They want to be associated with their fathers.

Well, it turns out that the more even our relationship is, the happier both partners are.

The data of psychologists and sociologists are very convincing here.

I think we have compelling numbers and data to prove to men that gender equality is not a zero-sum game, it's a win-win.

Here's what the data show:

Now, when men begin the process of balancing work and home, we have two phrases we often use to describe our work.

We will work with you and help you.

(Laughter) And I'll suggest something a little more radical. In a word, "share".

(Laughter) The data shows that when men share housework and childcare, children do better in school.

Their children have lower absenteeism and higher achievement.

They are less likely to be diagnosed with ADHD.

They are less likely to see a child psychiatrist.

They are less likely to take medication.

So when men share housework and childcare, their children are happier and healthier, and men want it.

Wives are happier when men share housework and childcare. Of course.

Not only that, their wives are getting healthier.

Their wives reported being less likely to see a therapist, less likely to be diagnosed with depression, less likely to take medication, more likely to go to the gym, and higher marital satisfaction.

So when men share housework and childcare, wives are happier and healthier, and men certainly want that.

Men are healthier when they share housework and childcare.

They smoked less, drank less, and took less recreational drugs.

They are less likely to go to the ER, but prefer to go to the doctor for regular checkups.

They are less likely to see a therapist, are less likely to be diagnosed with depression, and are less likely to take prescription drugs.

Therefore, men are happier and healthier when they share housework and childcare.

And who wouldn't want that?

And finally, when men share housework and childcare, they have more sex.

(Laughter) Now, which of these four interesting discoveries do you think made it onto the cover of Men's Health?

(Laughs) “Housework excites her.

(Not when she does that.)" (Laughter) Now, just to remind the men in the audience, these data were collected over a very long period of time, and we don't want the listener to say, "Hmm, okay, I think I'm going to do the dishes tonight."

These data were collected over a very long period of time.

But I think this points to something important. You'll love it when Men's Health magazine put this song on its cover, it was also called "Choreplay."

So what we discovered is very important. Gender equality benefits countries, businesses, men, their children and partners, and is not a zero-sum game.

It's not about winning or losing.

It's a win-win for everyone.

And what we do know is that you can't fully empower women and girls without getting boys and men involved.

we know this

And my position is that men need exactly what women perceive they need to live the life they want to live, in order to live the life we ​​want to live.

In 1915, on the eve of the massive suffrage demonstrations on Fifth Avenue in New York City, a writer living in New York wrote an article for a magazine titled "Feminism for Men."

And this was the first line of the article, "Feminism will enable men's freedom for the first time."

thank you.

(applause)

A big thank you to everyone at TED, especially Chris and Amy.

I can't believe I am here.

I haven't slept in weeks.

Neil and I were sitting there comparing how much we hadn't slept in anticipation of this. I've never been this nervous - and when I'm nervous, I do, now I realize. (Laughter) So I'm going to talk about what we've done with this organization, 826 Valencia, and then talk about how we can all come together and do the same thing.

Around 2000, I was living in Brooklyn, trying to finish my first book, and I was idling around every day as I was writing from 12:00 to 5:00.

That's why I was walking around in a daze during the day.

I didn't have the mental strength to speak of during the day, but the hours were flexible.

In the Park Slope neighborhood of Brooklyn where I lived, there are a lot of writers. There seems to be a very high ratio of writers to the general public.

During that time, I have grown up surrounded by many teachers.

My mother was a teacher, my younger sister became a teacher, and many of my friends became teachers after college.

So I always listened to them talk about their lives and how inspiring they were, and they were some of the hardest working and always inspiring people I've known.

But I knew a lot of what they were up against, a lot of the struggles they were dealing with.

One of them was that many of my friends who teach in schools in the city are having trouble keeping up with their grade level, especially in reading and writing.

Now, a great many of these students come from non-English-speaking homes, and many of them have a variety of special needs and learning disabilities. And, of course, they work in schools, sometimes, and very often, underfunded.

And they told me about this and said, “What we really need is more people, more organization, more one-on-one attention, more time, and more expertise in people who have English skills and can work one-on-one with these students.”

Well, I say this. “Then why not work with them one-on-one?”

And they said, "Well, we have five classes with 30-40 students each.

This allows us to have up to 150, 180, 200 students per day.

How can we give each student even one hour of one-on-one attention each week?”

It is necessary to significantly increase the working hours of the week and create duplicates of teachers.

So we started talking about this.

And at the same time I thought about this large group of people I know. Writers, editors, journalists, graduate students, assistant professors, you name it.

All these people had flexible hours each day and were interested in the English language. I would like to be interested in English, but I can't speak it well right now. (laughs) I'm doing my best. That watch fascinated me.

But everyone I knew was concerned with the primacy of the written word in fostering democracy and fostering an enlightened life.

And, you know, they had the time and the interest, but at the same time, my community didn't have the conduit connecting those two communities.

So when I moved back to San Francisco, I rented this building.

And the idea was to move McSweeney's -- McSweeney's Quarterly, which we publish two or three times a year, and a few other magazines into the office for the first time.

It was in my kitchen in Brooklyn.

We were going to move it into the office and actually share the space with the tutoring center.

So we thought: “You're going to have people like writers, editors, and the writing community come into the office every day, but what if you opened up the front of the building so that students could come in after school and get extra help with their writing homework? Then there would be basically no boundaries between those two communities.”

So at 2:30pm, the idea was to start everything we were working on. It doesn't matter if students come in and stop what they're doing, make deals, work a little later, or whatever.

Give your neighborhood students an afternoon.

So we had this place and rented it out and the landlord gave it all a go. We made this mural. This is a Chris Ware mural that basically explains the entire history of print in the form of a mural. It takes a long time to digest and you have to stand in the middle of the road.

So I rented this space.

And everything was great except the landlord said, 'Well, this space is zoned for retail, so we need to come up with something.

I have to sell something.

Individual guidance centers alone are not enough. ”

So we thought, "Hahaha! Really!"

We didn't necessarily come up with something we could sell, but we did all the necessary research.

It used to be a weight room, so it had rubber floors, soundproof tile ceilings, and fluorescent lighting underneath.

We demolished them all and found beautiful wooden floors, whitewashed beams. And it kept its appearance. When we were renovating this place, someone said, "Look, it really looks like the hull of a ship."

And as we looked around, other people said, "Well, we should sell our supplies to working pirates." (Laughter) So this is what we did. So we made everyone laugh, and we said, 'There's a reason for that, too.

Let's sell pirate goods." This is a pirate goods store.

You see, this is like a sketch I did on a napkin.

A great carpenter built all these things, and we made it look like some kind of pirate supply.

Planks are sold here, and supplies to fight scurvy are available.

All peg legs are handmade to fit you.

At the top is the eyepatch display, with a black column for everyday use of the eyepatch, then pastels and other colors for special occasions, bar mitzvahs, and other nights out.

So we opened this place. And this is the bucket in which the treasures dug by the students are stuffed.

A replacement eye for those who have lost one eye.

These are some signs that are all over us: "Pranking with pirates."

While you read the sign, pull the rope behind the counter and eight mop heads will drop on your head.

It was just my one thing - I said we have to have something that falls on people's heads.

I became a mop head. This is the fish theater, and we set up a tutoring center right behind the three-seat saltwater aquarium.

There was a tutoring center right there, and behind the curtain was McSweeney's office, where we were all working on magazines, book editing, and so on.

Children would come in – or we thought they would come in. I should back off.

We established, opened and spent months renovating this place.

There were tables, chairs, computers and everything.

I went to a dotcom auction at the Holiday Inn in Palo Alto and bought 11 G4s with a single paddle.

Anyway, we bought them, set everything up, and waited.

It started with about a dozen friends who are neighborhood writers I've known for years.

and we sat down. and 2:30 p.m. We put our sandwich boards on the sidewalk in front. It simply said, "Free tutoring for your English-related and writing-related needs -- come, it's all free."

And we thought, 'Oh, they're going to storm the gate, they're going to love it. And they didn't.

So we waited, sat at a table, waited, waited.

And everyone was very disappointed because after waiting for weeks nobody came.

And someone warned us that there was a trust gap because we were operating behind a pirate supply store. (Laughter) We never did it together, you know?

So, around that time, I persuaded a woman named Nineveh Caligari who had been an educator in San Francisco for many years. She taught in Mexico City, had all the necessary experience, knew all about education, and had connections with all the teachers and community members in her neighborhood. I convinced her to move out of Mexico City where she was teaching.

She became managing director.

Soon she was barging in with teachers, parents, students and everyone else, and suddenly it was practically full every day.

And what we were trying to provide each day was one-on-one consideration.

The goal was to have a 1:1 ratio with all of these students.

It's been proven that 35-40 hours of one-on-one tutoring per year can improve student performance by one notch.

Therefore, most of these students do not speak English at home.

They come there, mostly parents -- you can't see them, but there's a church pew right there that I bought at a Berkeley auction -- parents who occasionally watch while their children are being taught.

That was the basic, one-on-one attention.

And we found that every day was full with our children.

Around 2:00 or 2:30 p.m., on Valencia Street within a few blocks of it, I often get run over by kids and big backpacks or whatever that actually run into this space. In a way this is very strange. Because this is school.

But there was something a little different psychologically going on there.

And the other thing is that there was no prejudice.

The children didn't go to "centers for children in need" or anything like that. It was 826 Valencia.

First of all, it was a pirate supply store, which is insane.

Then there is the publisher behind.

So very often our interns actually worked with students at the same table, shoulder to shoulder, next to computers and computers.

And it became a tutoring center, which we used to call a publishing center, and a writing center.

Once inside, they may actually be working with a high school student working on a novel. Because we had some very talented kids too.

So no prejudice.

They all work side by side. It's all a creative undertaking.

They are looking at adults. They model their behavior.

These adults, they work in their own fields.

They lean over and ask one of the adults a question that influences each other.

There is a lot of cross-pollination. The only problem, especially for the adults who work at McSweeney, was that we only had one bathroom, although we didn't necessarily accept all of this when we signed up. (Laughter) We have about 60 kids a day, so this is a problem.

But there's something about kids finishing their homework that day, working on it one-on-one, and getting all this attention—they went home and finished. they don't stall.

They don't do their homework in front of the TV.

They come home at 5:30pm and are allowed to enjoy their family, enjoy other hobbies, or go outside and play.

And that's what makes a happy family.

If there are happy families in your neighborhood, you have a happy community.

When many happy communities come together, a happy city and a happy world are born.

So the key to everything is homework. (Laughter.) (Applause.) Now you need one-on-one attention.

It started with 12 volunteers, grew to 50 and then hundreds.

And now we have 1,400 volunteers on our roster.

And we make volunteering incredibly easy.

The important thing is that even if you only have a few hours in a month, those two hours of focused attention shoulder to shoulder next to a student and shining this beam of light on your work, your thoughts and your self-expression would be absolutely transformative. Because so many students have never had that experience before.

So we said, "If you have two hours on a Sunday once every six months, that's fine. That's enough."

That's part of the reason why the tutoring corps grew so quickly.

So we said, "We have to use it by 2:30pm, so what are we going to do with that space during the day?"

So I started taking classes during the day.

So every day we have field trips and we create books together. You can see me typing the book above.

This is one of the classes I'm so excited to write.

Just point the camera at the class and it will always look like this.

So this is one of the books they did.

Notice the title of the book, "The Book That Was Never Checkout: Titanic."

The first line of the book is, "Once upon a time there was a book named Cindy that was written about the Titanic."

On the other hand, there are adults in the background who are seriously typing this, and they are taken aback.

So we still needed more tutors.

Here are some shots of the instructor during the event.

The teachers we work with are all different than teachers, but they tell us what to do.

We go in there and say, 'At the end of the day, we're totally malleable.

Our neighbors will teach us, our parents will teach us.

Our teachers will tell us how we can help. ”

So they said, "Why don't you come to school?"

Because what happens to students who don't necessarily come to you—they don't have active parents to bring them, or aren't close enough? ’ So we started saying,

Let's say the words. ' The teacher says, 'We need 12 tutors for the next five Sundays.

We are working on a college essay. send them ”

So we announced internally that we have 1,400 tutors.

Anyone who can do that please sign up. They go about 30 minutes before class.

Teachers explain to them what to do, how to do it, training content, and previous projects.

They all take place in one big room under the guidance of a teacher.

And that really bears the brunt of what we do. From work, from home, people go straight to the classroom and work directly with students.

Then you will be able to work with thousands more students.

Then another school said, "Well, why don't we just provide the classrooms and have them manned all day?"

This is the Everett Middle School Writers' Room, decorated in a buccaneer style.

It's right next to the library. And we serve all 529 students in this middle school.

This is their newspaper, Straightup News, with columns by Mayor Gavin Newsom in both English and Spanish.

So one day Isabel Allende wrote us a letter and said, "Hey, why don't you give books to high school students?"

I want you to write about how to achieve peace in a violent world. ”

So we went to Thurgood Marshall High School. This school is a school where we have been doing other things and giving our students that challenge.

And we said, 'Isabel Allende is going to read all your essays at the end.

She plans to publish them in a book.

She plans to sponsor the printing of the paperback edition of this book.

The book will be available in the Bay Area and in all bookstores worldwide, including Amazon. ”

So these kids worked harder than they had ever worked before in their lives. Because there was an outside audience, and on the other side was Isabel Allende.

About 170 instructors collaborated on the book, so it went very well.

At the end we had a big party.

It's a book that's everywhere. That led to a chain of events.

We see Amy Tan sponsoring the upcoming "I Might Get Somewhere."

And this has become an ongoing one. More and more books.

Now we are obsessed with books.

Children will work harder than they have ever worked if they knew it was something permanent, that they knew it would be shelved, that nothing they thought or said could be taken lightly by anyone, and that we respected their words and respected their thoughts in hundreds of hours five drafts, six drafts, and all this attention we put into their thoughts.

And once you reach that level, once you've written at that level, you can't go back.

It's completely transformative.

And they are all sold in stores. This is near the board.

We sell all books for students.

where else would you put it?

So we sold them, but then something strange was happening in the store. In fact, the store—despite starting out as just a gag—actually made money.

That's how I paid my rent.

Perhaps this is just a San Francisco thing, I don't know. I don't want to judge.

But people came. And this was before there were pirate movies and such.

It was making a lot of money. It wasn't a lot of money, but I paid the rent and paid the full-time staff there.

You can see the ocean map on the left.

And it became the gateway to the community.

People came in and said,

What's this?" I don't want to be abusive on the web (laughter) Is that a rule? I don't know.

They will say, "What is this?"

And people will come along and learn more about it.

And just beyond that, there's usually a little chain there, and just beyond that, you see children being instructed.

This is a field trip being done. So they will shop, and they may more likely buy what we sell, such as lard and millet for their parrots, or nighttime hooks and hook protectors.

So the store actually did very well.

But it was street level, so there were so many people: teachers, donors, volunteers, everyone. was open to the public.

It wasn't a nonprofit buried on the 30th floor of a downtown building. It just served the neighborhood and was open to the public at all times.

So it became such a strange and happy accident.

So all the people I used to know in Brooklyn were like, "Well, why don't we have a place like that here?"

And many of them were former educators or would-be educators, so they worked with many local designers and local writers, took their ideas independently, and did their own thing.

They didn't want to sell pirate goods.

They didn't think it would work there.

So, familiar with New York's crime-fighting community, they founded the Brooklyn Superhero Supply Company.

It's a great design by Sam Potts that makes this possible.

This was to make it look like locksmith shops all over the place that had to offer all the services they ever provided.

So they opened this place. The inside is like a Costco for superheroes, with all the essentials in basic form.

These are all handmade.

These are all reuses of other products and more.

All packaging is done by Sam Potts.

So there are villain containment units where kids put their parents in. you have an office

This is a small safe. Put the goods there and go up with the electric elevator. The man behind the counter then tells you that if you want to buy anything, you must recite the Hero's Oath. I will. And it actually limits their sales.

Personally, I think that's the problem.

Because they have to put their hearts into everything they do.

They are part of the product. These are all handmade.

This is a secret identity kit.

If you want to assume the identity of Sharon Boone, an American female marketing executive from Hoboken, New Jersey. This is the complete document of everything you need to know about Sharon Boone.

This is Cape Lee, where you get your cape fitted and climb three steel steps. Then turn on the three hydraulic fans from all sides and you can see the cape in action.

See, there's nothing worse than climbing up there and seeing your cloak rise up.

Now the secret door--this is one of the shelves you can't see when you enter, but it slowly opens.

You can see it in the center next to all the grappling hooks.

When you open it, this is the tutoring center in the back. (Applause) You can see the full effect.

But this is -- and I want to stress -- locally funded and locally built.

All the designers and builders were local and always pro bono.

I just came over and said, "Yes, everyone is fine," or something like that. that was it. Behind it are the times for all five boroughs of New York. (Laughter) (Applause) This is the space during tutoring hours.

I am very busy. The same principles: one-on-one attention, complete dedication to the student's work, boundless optimism and a certain capacity for creativity and ideas.

And this switch flips in their heads when they walk the 18 feet of this strange store, right?

In other words, it is a school, but it is not a school.

This is clearly not a school, even if they are studying side by side with tables, pencils, papers, etc.

This is Khaled Hamdan, one of the students.

You can read this quote.

Obsessed with video games and TV. I couldn't concentrate at home.

I came in. Attracted focused attention.

And he couldn't get away from it.

So soon he started writing. He was obsessed with finishing his homework early.

It's addicting to get it sorted out, have it checked, and know he can accomplish the next thing and be ready for school the next day.

So he got into it and started doing other things.

He currently has five books published.

He co-wrote a mockumentary about a failed superhero called "Super-Has-Beens."

He wrote the Penguin Balboa series about fighting, boxing and penguins.

And just a few weeks ago, I read to 500 people in Symphony Space for the 826 New York charity. So he's there every day.

He is evangelical about it. He's bringing his cousins ​​now.

A family of four comes here every day.

So let's go through it quickly.

This is the Time Travel Mart in Echo Park, Los Angeles. "Anytime, we're already in the moment." (Laughter) It's like a 7-Eleven for time travelers.

So you know everything. Exactly the same as 7-Eleven.

Leech. mass of mammoths. They even have their own slurpy machine, "It's out of order. Please come back yesterday." (Laughter) (Applause) Anyway. So I'm going to jump ahead.

These are spaces that have partnered only with us to do this same thing. Word St. in Pittsfield, Massachusetts. Cincinnati Ink Spot. Youth Speaks in San Francisco, California, who inspired us. St. Louis Studio St. Louis. Austin Bat Cave in Austin. Fighting Words in Dublin, Ireland, started by Roddy Doyle, opens in April.

I'm going to TED Wish -- are you okay?

Okay, I have a little time. So that's TED's wish. We hope that you, and every creative individual or organization you know, can find a way to directly engage with public schools in your area, share how you got involved, and reach 1,000 examples within a year. -- About transformative partnerships.

Profound Leap!

And these may be things you already do.

I know so many people in this room are already doing really interesting things.

I know it as a fact. So tell us these stories and inspire others on your website.

I created a website.

Switch to "we" instead of "me". Hope: We hope that the participants of this conference will usher in a new era of public school participation.

We hope that you will take the lead in partnering your innovative spirit and expertise with that of the innovative educators in your community.

Always ask your teacher for guidance.

They teach you how to help. I would love for you to step in and help me.

There are a million ways.

You can walk to your local school and talk to your teacher. They always tell me how to help.

This is Hot Studio in San Francisco for doing this amazing job.

This website is already up and running with lots of stories and ideas already. It's titled "Once Upon a School," and I think it's a great title.

This site will document every story and every project that happens at the conference and around the world. So when you go to the website, you'll see a lot of inspirational ideas. And add your own project once you get started.

Hot Studio did a great job on a very tight deadline. So visit the site.

If you have any questions, ask this guy who is the Director of National Programs. he answers the phone

Email him and he will answer any questions.

And he will inspire you, propel you forward, and guide you through the process so you can influence change.

And it can be fun! That's the point of this story. It does not have to be sterile. It need not be bureaucratically untenable.

You can work with the skills you have.

school needs you teachers need you

Students and parents need you. They need your real personality, your open mind, your open ears, and your boundless compassion to sit next to them and listen, nod, and ask questions for hours at a time.

Some of these kids have no idea how good they are—how smart they are and how much they have to say.

you can tell them You can shine that light on one human interaction at a time. Please join us.

Thank you very much.

I published this article in the New York Times Modern Love column in January of this year.

"To fall in love with anyone, do this."

And the article is about a psychology study aimed at creating romantic love in the lab, and my own experience trying that study out myself one night last summer.

The procedure is therefore very simple. Two strangers take turns asking each other 36 personal questions, then staring into each other's eyes without saying anything for four minutes.

So here are some example questions.

Number 12: If you could wake up tomorrow and have any one quality or ability, what would it be?

28: When was the last time you cried in front of another person?

by myself?

As you can see, they actually become more personal over time.

Number 30, I love this one. Tell your partner what you like about yourself. Be very honest this time and say things you might not say to someone you just met.

So when I first encountered this research a few years ago, there was one thing that really bothered me. It was rumored that two of the participants got married six months later and invited the entire lab to the ceremony.

So I was of course very skeptical of this process that just creates romantic love, but of course I was intrigued.

And when I got the chance to test this research myself with someone I know but not particularly close with, I didn't expect to fall in love.

But then we did, and -- (laughter) and I thought it was a good story, so I sent it in for a Modern Love column a few months later.

Now, this was published in January, and now that it's August, I'm sure some of you were wondering, "Are we still dating?"

You are wondering this because I have been asked this question over and over and over again for the last seven months.

And this question is exactly what I want to talk about today.

But let's get back to it.

(Laughs) So the week before the article came out, I was very nervous.

I've been writing books about love stories for the past few years, so I'm used to blogging about my love life.

But my blog posts only got a few hundred views at most, usually just my Facebook friends, and my article in the New York Times probably got a few thousand views, I thought.

And it felt like a lot of attention was being given to a relatively new relationship.

But as it turned out, I had no idea.

So the article was published online on Friday night and by Saturday something like this had happened to my blog traffic.

By Sunday, I got calls from both The Today Show and Good Morning America.

This article would get over 8 million views within a month, and I was ill-prepared for this kind of attention, to say the least.

It's one thing to write confidently and honestly about your love life, one to discover that your love life has made international news (laughs), and one to realize that people around the world are genuinely interested in your new love situation.

(Laughter.) And when people called and emailed, it was every day for weeks, they always asked the same question first. "Are you guys still together?"

In fact, while preparing for this talk, I did a quick search in my email inbox for the phrase "Are you still together?"

Immediately some messages popped up.

It was from students, journalists, and friendly strangers like this one.

I was interviewed on the radio and they asked.

I gave a talk, and a woman yelled at the stage, "Hey Mandy, where's your boyfriend?"

and immediately turned bright red.

I understand that this is part of the deal.

If you write about your relationship in an international newspaper, you should expect people to ask about it lightheartedly.

But I wasn't ready for the range of responses.

The 36 questions appear to stand alone.

In fact, the New York Times published a follow-up article to Valentine's Day, featuring readers' experiences of attempting this research themselves, with varying degrees of success.

So my first impulse in the face of all this attention was to be very protective of my own relationship.

I said no to all requests for the two of us to make media appearances together.

I declined TV interviews and said no to all requests for photos of the two of them.

I think I was afraid that I would become a symbol of the process of our falling in love, but I felt completely unqualified for that position.

I understand that. People didn't just want to know if the study worked, they wanted to know if it really worked, that it could create real love, sustainable love, not just flirting.

But this was a question I couldn't answer.

I myself had only been in a relationship for a few months, so I felt like people were asking the wrong questions in the first place.

What would we actually tell them if we knew we were still together?

If the answer is no, does it make the experience of answering these 36 questions any less valuable?

Dr. Arthur Aaron first wrote about these questions in this study in 1997. In this study, the researchers' goal was not to create romantic love.

Instead, they wanted to use what Aaron called "sustained, escalating, reciprocal, and personal self-disclosure" to promote relationship intimacy among college students.

Romantic, isn't it?

But the research worked.

Participants did indeed feel closer after doing this, and several subsequent studies have also used Aaron's Fast Friend Protocol as a way to quickly build trust and intimacy between strangers.

They used it among members of the police and members of the community, and they used it among people with conflicting political ideologies.

The original version of the story, a combination of personal questions and four minutes of eye contact, that I attempted last summer and was referenced in this article, was unfortunately never published.

So, a few months ago, I was giving a talk at a small liberal arts college, and afterward a student came up to me and said, somewhat shyly: "So I tried your study, but it didn't work."

He seemed a little perplexed by this.

"So you didn't fall in love with the person you worked with?" I asked.

“Well…” he paused.

"I think she just wants to be friends."

"But did we get along better?" I asked.

“Did you feel like you got to know each other really well after doing your research?”

he nodded.

"So it worked," I said.

I don't think this is the answer he was looking for.

In fact, I don't think this is the answer any of us are looking for when it comes to love.

I first encountered this study when I was 29 and going through a really painful breakup.

I've been in a relationship since I was 20, that's pretty much all of my adulthood, and he was my first true love. I had no idea how I could or could live without him.

So I turned to science.

I researched everything I could about the science of love. And I guess I was hoping that it might somehow prevent me from getting hurt.

I don't know if I realized this at the time, I thought I was just doing research for this book I was writing, but in retrospect it seems pretty obvious.

I hoped that if I had some knowledge of romantic love, I might not feel as terribly alone as I did then.

And all this knowledge was useful in a way.

I become more patient with love. I am more relaxed.

I feel more confident in asking for what I want.

But I can see myself more clearly, and I also see that what I want is sometimes more than I can reasonably ask for.

What I want from love is not the guarantee that I will be loved today and will be loved tomorrow, but the guarantee that the person I love will love me forever.

Perhaps what people really asked when they wanted to know if we were still together was about this potential guarantee.

So the story told by the media about 36 questions was that there might be a shortcut to falling in love.

There may be ways to mitigate the associated risks in some way. This is a very charming story. Because falling in love is a wonderful thing, but it's also a terrible thing.

The moment you admit that you love someone, you admit that you have a lot to lose. It is true that these questions provide a mechanism for getting to know the other person quickly, and it is also a mechanism for getting known. I think what most of us really want from love is to be known, to be seen, to be understood.

But when it comes to love, I think we're too happy to accept the shorter version of the story.

A version of the story that asks, "Are you still together?"

And we will be satisfied with a "yes" or "no" answer.

So instead of asking that question, I suggest you try asking a more difficult question, something like this: How do you decide who deserves your love and who doesn't?

How do you stay in love when things get tough, and how do you know when to round up and run away?

How do you deal with the suspicion that inevitably creeps into every relationship, or, more difficultly, your partner's suspicion?

I don't necessarily know the answers to these questions, but I think it's an important starting point for a more thoughtful conversation about what it means to love someone.

So, if you don't mind, the short version of my relationship story is this: A year ago, an acquaintance and I did research aimed at creating romantic love, and we fell in love, and we're still together, and I'm very happy.

But falling in love is not the same as staying in love.

Falling in love is easy.

So I wrote at the end of the article, "Love never happened to us.

We are in love because each other chose to be. ”

Reading it now makes me cringe a little. Not because it's not true, but because at the time I didn't really consider everything that was involved in that choice.

I didn't think about how many times we would have to make that choice with each other and how many times I would have to make that choice without knowing if he would always choose me.

I hope it was enough for you to answer 36 questions and choose to love someone so generous, kind, and fun, and have that choice broadcast in America's biggest newspaper.

But what I did instead is turn my relationship into the kind of myth I don't really believe in.

And what I hope, perhaps for the rest of my life, is that the myth is true.

I want the happy ending that the title of the article implies. By the way, that's the only part of the article that I didn't actually write.

(Laughter.) But what I have instead is the chance to choose to love someone and the hope that he will choose to love me back. It's scary, but that's the deal with love.

thank you.

A question I am often asked is where did my passion for human rights and justice come from?

It started early.

I grew up in the West of Ireland with four siblings, two older and two younger.

So naturally, I had to be concerned and committed to human rights, equality and justice.

(Laughter) And these issues have stuck with me and guided me especially when I was elected Ireland's first female president from 1990 to 1997.

I have dedicated my Presidency to making room for those who feel marginalized on the island of Ireland and to working to build peace by uniting Northern Irish and Republican communities.

And as the first President of Ireland, I traveled to England, met with Queen Elizabeth II, and welcomed members of the royal family, including the Prince of Wales, among others, to my official residence - what we call 'Arras an Uaktaline', the House of the President.

And when I took office, I recognized that Ireland was a country undergoing rapid economic development.

We were a nation benefiting from the unity of the European Union.

In fact, when Ireland first joined the European Union in 1973, there were parts of the country that were considered underdeveloped, including my own beloved hometown of Mayo.

I have led trade delegations here in the United States, Japan, and India to encourage investment, create jobs, advance economies, support health care systems, education, and development.

What I didn't have to do as president was buy land in mainland Europe so that Irish people could go there because our island was going under water.

What I didn't have to think about, neither as president nor as a constitutional attorney, was the impact of climate change on territorial sovereignty.

But President Tong of the Republic of Kiribati must wake up every morning and think about it.

He bought land in Fiji as insurance because he knew his people might have to leave the island. This is called “migration with dignity”.

As I listened to President Tong's explanation of the situation, I was keenly aware that this is a problem that leaders should face.

And as I listened to him talk about the pain of his problems, I thought of Eleanor Roosevelt.

I remembered her and those who worked with her on the Human Rights Commission she chaired in 1948 and which drafted the Universal Declaration of Human Rights.

They would never have imagined that an entire country would disappear because of man-made climate change.

As a scientist and environmental lawyer, I began to get interested in climate change, so images of polar bears and melting glaciers were less impressive.

It was because of the impact on people and their rights to food, safe water, health, education and housing.

I humbly say this because I was slow to address the issue of climate change.

When I was the United Nations High Commissioner for Human Rights from 1997 to 2002, climate change was not on my mind.

I don't remember ever giving a speech on climate change.

I knew there was another part of the United Nations, the United Nations Climate Change Convention, which deals with climate change issues.

It was then that I started working on development and human rights issues in African countries.

And I heard this word all the time. "Oh, but things are worse now, things are getting worse."

And I explored what was behind it. It was about climate change—climate shocks and weather changes.

I met Ms. Constance Okoret, who was running a women's group in eastern Uganda. She said that when she was a child, she lived a normal life in the village, never starved, knew that the seasons would come as predicted, knew when to sow and when to harvest, and had enough food.

But in recent years, at the time of this conversation, there has only been a long period of drought followed by a flash flood and then another drought.

Schools were destroyed, livelihoods destroyed, crops destroyed.

She formed this women's group to bring the community together.

And this was a real shocking reality for me. Because, of course, Constance Okoleto was not responsible for the greenhouse gas emissions causing this problem.

In fact, I was very shocked by the situation in Malawi in January this year.

The country experienced unprecedented flooding, flooding about a third of the country, killing more than 300 people and leaving hundreds of thousands without their livelihoods.

And the average person in Malawi emits about 80kg of CO2 per year.

The average US citizen emits about 17.5 tons.

So those who are unjustly suffering are increasingly feeling the impacts of climate change, even though they don't drive, have no electricity and consume less, and that change leaves them unaware of how to grow food properly and how to manage their future.

I think what really struck me was the importance of injustice.

And we know that we cannot address some of that injustice because we are not on our way to a safer world.

Governments around the world agreed at the Copenhagen meeting and have repeated it at every climate conference that the rise in temperature above pre-industrial levels must be kept below 2 degrees Celsius.

But we are on the course of about 4 degrees.

We therefore face an existential threat to the future of our planet.

And it has made me realize that climate change is the greatest threat to human rights in the 21st century.

And that got me climate justice.

Climate justice responds to the moral argument—both sides of the moral argument—to address climate change.

First and foremost, stand by those who suffer the most and are most affected.

And second, to ensure that they are not left behind again when we start to move and start tackling climate change with climate action as we are doing.

It is amazing how many people are left behind in today's highly unequal world.

In a world of 7.2 billion people, about 3 billion people are being left behind.

1.3 billion people have no access to electricity and use kerosene and candles to light their homes, both of which are dangerous.

And indeed they spend much of their meager income on such lighting.

2.6 billion people cook over open fires using coal, wood and animal dung.

And this is responsible for about 4 million deaths a year from indoor smoke inhalation, most of them women, of course.

So our world is very unequal and needs to change from 'business as usual'.

Nor should we underestimate the scale and transformative nature of the change that will be required. To keep warming below 2 degrees Celsius, we need to reduce carbon emissions to zero by around 2050.

That means about two-thirds of the known fossil fuel resources must remain underground.

This is a huge shift and clearly means that developed countries must cut emissions, become more energy efficient and move to renewable energy as soon as possible.

The problem and challenge for developing countries and emerging economies is to grow without emissions. Their population is very poor.

So we have to develop without emissions, but that's a different kind of problem.

In fact, no country in the world has actually grown without emitting emissions.

All countries have developed on fossil fuels, but may then move to renewable energy.

This is therefore a huge challenge and requires the full support of the international community with the necessary funding, technology, systems and support. Because no country can protect itself from the dangers of climate change.

This is a problem that requires the complete unity of humanity.

It could be called human solidarity based on self-interest. Because we are all in this together, and we must work together to ensure we reach carbon zero by 2050.

The good news is that changes are happening, and they are happening very fast.

Here in California, we have very ambitious emissions targets set to reduce our emissions.

Hawaii is trying to pass a bill to make it 100 percent renewable by 2045.

And governments around the world are very ambitious.

Costa Rica has committed to becoming carbon neutral by 2021.

Ethiopia is committed to becoming carbon neutral by:

Apple has committed to using renewable energy in its factories in China.

And now there is a race to convert electricity from tidal and wave power in order to keep coal in the ground.

And that change is both welcome and happening very quickly.

But that alone is not enough, and political will is still not enough.

Let's go back to President Tong and the people of Kiribati.

They could actually live on their own islands and find a solution, but that would require a lot of political will.

President Tong told me about an ambitious idea to build or even float small islands for people to live on.

Of course, this is beyond Kiribati's own resources.

It will require a great deal of unity and support from other nations, and imaginative ideas that will unite us when we want to have a space station in the air.

But wouldn't it be great if we could realize this engineering marvel so that people could stay in sovereign territory and be part of a community of nations?

It seems to be said that we should think about such a way of thinking and thinks.

Yes, the transformational challenges we need are big, but they can be solved.

In fact, as a nation, we are very capable of coming together to solve problems.

This year I participated in the 70th anniversary of the end of World War II in 1945, so I was very conscious of that.

1945 was a special year.

This was the year the world faced a problem that seemed almost insoluble: the devastation of World War II, especially World War II. The fragile peace brought. The need for overall economic revitalization.

But the leaders of the time were not daunted by this.

They had the ability and a sense of duty to ensure that the world never had this kind of problem again.

And they had to build structures for peace and security.

And what did you get? what have they achieved?

The United Nations Charter, the Bretton Woods Institutions, the so-called World Bank, and the International Monetary Fund.

The Marshall Plan to rebuild a devastated Europe.

And indeed, a few years later, the Universal Declaration of Human Rights was published.

2015 is a year of the same importance, the same challenges and the same possibilities as 1945.

There will be two big summits this year. The first, in September in New York, is a summit on the Sustainable Development Goals.

And at the summit to be held in Paris in December, an agreement on climate change was signed.

The Sustainable Development Goals aim to help countries live in harmony with Mother Earth by living under sustainable development rather than depriving Mother Earth and destroying ecosystems, and to support sustainable living in harmony with Mother Earth.

And the Sustainable Development Goals will come into force in all countries on January 1, 2016.

A binding climate pact, a climate pact, is needed because there is scientific evidence that the Earth is on an orbit of about 4 degrees of warming and will need to change course to stay below 2 degrees.

Therefore, we need to take measures that are monitored and reviewed so that we can continue to increase our ambition about how to reduce emissions and move more quickly to renewable energy to achieve a safer world.

In reality, this issue is too important to leave to politicians and the United Nations.

(Laughter) This is a problem for all of us and a problem that needs more momentum.

In fact, the justice side has changed the face of environmentalists.

It is now a problem for faith-based organizations under the exceptional leadership of Pope Francis, and indeed for the Church of England, which is moving away from fossil fuels.

This is a problem for the business world and the good news is that the business world is changing very quickly, except in the fossil fuel industry (laughter).

But not only are businesses moving rapidly towards the benefits of renewable energy, they are also asking politicians to give them more signals so they can move even faster.

That is a problem for the trade union movement.

It's a women's movement issue.

It's a problem for young people.

It shocked me to learn that Jibril Kazan, one of the Greensboro Big Four who participated in the Woolworths sit-in, just recently described climate change as a lunch-counter moment for young people.

So it's the lunch counter moment for 21st century youth. This is like a real human rights issue in the 21st century. Because, he said, it is the greatest challenge to humanity and justice in our world.

I remember the climate march last September very well. It was a huge force not only in New York but around the world.

And you have to build on that.

I was marching with some of the Elders and saw the placard at a distance, but we were so crowded together that with 400,000 people on the streets of New York, it was difficult to reach the placard. I wish I could have gotten off behind that placard, because it said "Angry Granny!"

(Laughs) I felt that way.

And now I have 5 grandchildren. As an Irish grandmother, I am very happy to have five grandchildren. And think about their world, and what it will be like in 2050 when they share it with nearly 9 billion people.

We know that the emissions we already produce will inevitably lead to a climate-constrained world, but if we switch to renewable energy early enough and no one is left behind, we could have a much more equal and just world, better for health, jobs and energy security.

No one is left behind.

And just like we've been looking back at this year, looking back at 70 years from 2015 to 1945, I hope the world will look back from 2050 to 35 years, 35 years to 2015, and say, "Wouldn't they have done better in 2015?"

We are truly grateful for the decisions they made to make a difference and put the world on the right path, and we are now benefiting from that path.”

That is the theme for this year.

And somehow for me it's captured in the words of someone I respected so much.

She was my mentor, my friend, and though she died too young, she was an extraordinary personality and a great advocate for the environment, Ms. Wangari Maathai.

Wangari once said, "There will come a time in the course of history when mankind will be required to move to a new level of consciousness and attain a higher moral sphere."

that is what we must do.

We need to reach a new level of consciousness, a higher moral foundation.

And we have to do that with these two big summits this year.

And it won't happen without momentum from people around the world who say, "We want to act now, we want to change course, we want a safer world, a safer world for future generations, a safer world for our children and grandchildren. And we are all in this together."

thank you.

(applause)

Wow, what an honor. I always wondered what this would be like.

So eight years ago, I got the worst career advice of my life.

A friend said to me, 'Don't worry about how much you love what you do.

It's all about building a resume. ”

And I just got back from living in Spain for a while and joined this Fortune 500 company. I thought: "This is great.

I'm going to have a big impact on the world. ”

I had all these ideas. Then, within about two months, I noticed an odd urge to bang my head against the computer monitor every morning around 10am.

I don't know if anyone has ever felt it.

And soon after, I realized that every competitor in our field had already automated my job role.

And this is when I got some sage advice for building my resume.

Well, I read Warren Buffett's very different advice while trying to change the situation by jumping out of which double story window. he said: “Taking a job to boost your resume is like saving up sex for your old age.”

(Laughter) After hearing that, that was all I needed.

Within two weeks I was out of there. And I left with only one purpose. It's about finding something that can go wrong. It was so hard.

I wanted to make an impact. It didn't matter what it was.

And I quickly learned that I was not alone. We found that over 80 percent of the people around us didn't enjoy their jobs.

I think this room is different, but this is the average of the Deloitte study.

So I wanted to know what differentiated these people, who wake up every day inspired by their passionate, world-changing work, from the other 80 percent who live a life of quiet desperation.

So I started interviewing everyone doing this exciting job. I read books and did case studies. I read a total of 300 books on purpose, career, and everything else. I was just completely absorbed in myself. It was a really selfish reason. I wanted to find a job that I couldn't do, what that meant to me.

But as I did so, more and more people started asking me. "You are interested in this career.

i don't like my job May I sit down for lunch? ”

"Certainly," I think. But at this point my turnover rate was also 80%, so I had to warn them.

80% of the people I lunch with will leave their jobs within two months.

I was proud of it, and not that I had any special magic.

It was to ask one simple question.

That is, "Why are you doing this job?"

And more often than not, their answer was, "Yeah, because someone said you should."

And I've noticed that so many people around us climb this ladder with someone telling them to climb it, only to end up leaning against the wrong wall or against no wall at all.

The more I spend time with these people and see this issue, the more I thought, what if we could create a community where people feel like they belong, that it's okay to do things differently and take lesser paths, a place where it's encouraged and encourages people to change.

And that later became what I now call Live Your Legend. More on this later.

But as I made these discoveries, whether you were Steve Jobs or just the guy who runs the bakery down the street, I realized three really simple frameworks of things that all these passionate world changers have in common.

I would like to share these three with you. Then we can use them as lenses for the rest of today and hopefully the rest of our lives.

The first part of this three-step passion work framework is to become a self-expert and know yourself. Because if you don't know what you're looking for, you'll never find it.

And the problem is, no one is going to do this for us.

There are no passion, purpose, or career majors in college.

I don't know why it's not a mandatory double major, but you don't even have to start it.

That means I spend more time choosing my dorm room TV than I do choosing my major or field of study.

But the point is, it's our responsibility to figure it out, we need a framework, we need a way to get through this.

So the first step in our compass is finding out what our unique strengths are.

What is it that makes you want to wake up in the morning and that people appreciate you, whether you're paid or not?

StrengthsFinder 2.0 is part book and part online tool.

It is highly recommended to organize what you are originally good at.

Then what is the framework and hierarchy for making decisions?

Do we care about people, families, health, or accomplishments, successes, and everything else?

We need to understand what it is to make these decisions. In doing so, we need to know what our soul is made of and not sell it to some cause we don't care about.

And the next step is our experience.

We all have these experiences. Every minute of every day, we learn what we like, what we don't like, what we are good at, and what we are not good at.

And if you don't pay attention to it and spend the time absorbing that learning and applying it to the rest of your life, it will all be wasted.

Every day, every week, every month of the year, I spend time thinking about what worked and what didn't, what I'd like to repeat, and what I could apply more to my life.

And even more so, especially when you see people today doing things that inspire you and make you think, "Oh, what Jeff is doing, I want to be like him too."

why are you saying that? Please open your diary.

Write down what inspires you about them.

It won't be their whole life, but whatever it is, keep that in mind. Then, over time, it creates this repository that we can apply to our lives, be more passionately present, and use to make a greater impact.

Because when we start putting these together, we can define what success really means to us. Because without these different parts of the compass, success is impossible.

We end up in a situation like this. Everyone lives a scripted life that seems to be a life of climbing endlessly up this ladder.

It's like Wall Street No. 2, and if anyone sees it, a Peon employee asks the CEO of a major Wall Street bank. "What's your number? Everyone has a number. When you make this money, where are you going to leave it all?"

He says, "Oh, it's easy. More."

And he just smiles.

And that's the sad state of most people who don't spend time figuring out what's important to them and keep reaching for things that mean nothing to them. But we do it because everyone said we should.

But once we build this framework, we can start identifying what makes us come alive.

Before that happens, the passion may come and hit you in the face, or you may just throw it away in your future work because you have no way of identifying it.

But once you do, you'll see your strengths, your values, your alignment with who you are as a person, and I'm going to grab hold of this, do something with it, pursue it, and try to make an impact.

And without this compass to recognize, "Wow, this is what I want to pursue, and this is what I want to make a difference," Live Your Legend and the movement we've built wouldn't exist.

If you don't know what you're looking for, you'll never find it. But once you have this framework, this compass, you can move on. And I'm not the one there. It's about pushing your limits by doing the impossible.

There are two reasons why people don't do things.

One is to tell yourself that you can't do it, or that people around you say they can't.

Either way, we start believing it.

Either you give up, or you don't start at all.

The problem is that everything wasn't possible until someone did it.

Every invention, every new thing in the world, people thought was crazy at first.

It was physically impossible to break the 4 minute mile in a foot race until Roger Bannister got up and did it.

So what happened?

Two months later, 16 people broke the four-minute mile.

What we think is impossible in our minds is often just a milestone waiting to be achieved if we can push the boundaries a little.

And I think this probably starts with your body and fitness more than anything else, because that's what we can control.

If you think you can't run a mile, but show yourself that you can run a mile or two, or lose five pounds, or whatever, you'll gain more confidence and realize that you can apply it to the rest of the world.

And in fact, I've gotten into the habit of doing this little by little with my friends.

we have this small group. We are on physical adventures and recently found ourselves in a kind of dangerous place.

I'm scared of deep, dark blue water.

Since I watched Jaws 1, 2, 3, and 4 six times as a kid, I don't know if anyone had the same dread.

But what's above here can be felt right now, even if it's cloudy.

I swear there is something there.

Even if it's Lake Tahoe, it's freshwater, it's totally unfounded horror, it's ridiculous, but it's there.

Anyway, three years ago I found myself on a tugboat here in San Francisco Bay.

It was raining, stormy, and windy that day, and people were getting sick on the boat. I'm sitting there in my wetsuit, looking out the window in pure fear that I'm going to swim to my death.

Swim across the Golden Gate.

My guess is that some of you in this room may have done the same thing before.

As I was sitting there, Jonathan, my friend who had told me about it, came up to me and saw my condition.

And he says, "Hey Scott, what's the worst thing that could happen?

You're wearing a wetsuit. It never sinks.

If you can't go, hop on one of the 20 kayaks.

And if a shark attacks you, why choose you out of 80 people in the ocean? "Thank you for your help.

He says, "But really, have fun with this. Good luck."

And he dives in and swims away. OK.

After all, this encouragement worked perfectly and I felt completely calm like this. I think it was because Jonathan was 13 years old.

(Laughter) And out of the 80 people swimming that day, 65 were between the ages of 9 and 13.

Think about how you might approach the world differently if, at age 9, you knew you could swim 1.5 miles in 56-degree water from Alcatraz to San Francisco.

What would you say "yes" to?

What would you have given up? What would you like to try?

As I was finishing this swim, I arrived at the aquatic park and when I got out of the water, of course half the kids had already finished swimming, so they were cheering me on and everyone was excited.

And if anyone has swum in the bay, I'm totally a popsicle head, trying to unfreeze my face and watching people finish their swims.

And looking at this one child, something just didn't seem right.

And he's freaking out like this.

And he put his head back after he could barely breathe.

Then I realized that other parents were watching too. I swear they were thinking the same as me too. This is why you should never let a 9 year old swim out of Alcatraz.

This was not exhaustion.

Suddenly, two parents rushed over and grabbed him, put him on their shoulders, and dragged him like this, completely limp.

And suddenly they walked a few more feet and pushed him into a wheelchair.

And he pumped his fist in the craziest victory show I've ever seen.

I still feel the warmth and energy of this man when he accomplished this feat.

I saw him in a wheelchair earlier in the day.

It never occurred to me that he intended to swim.

I mean, where will he be in 20 years?

How many people told him he couldn't do that and that he would die?

You prove people wrong, you prove yourself wrong, you prove that you can push what you believe to be possible, piece by piece.

You don't have to be the fastest marathoner in the world to achieve them. Your own impossibility is enough. It starts with small steps.

And the best way to do this is to surround yourself with passionate people.

The quickest way to do something you think you can't do is to surround yourself with people who are already doing it.

In the words of Jim Rohn:

"You are the average of the five people you spend the most time with."

And no lifehack in the history of the world is greater than the people you choose to put in your corner as a lifehack to get from where you are now to where you want to be.

They change everything and it's a proven fact.

In 1898, Norman Triplett conducted this study on a large group of cyclists and timed them around the track both as a group and individually.

And he noticed that the cyclists in the group rode their bikes faster every time.

Since then, this has been repeated in every field, proving the same again. People around you matter, the environment is everything.

But it can go both ways, so you are in control of it.

80% of people don't like their jobs means that most people around us, not just in this room but elsewhere, foster complacency and prevent us from pursuing what's important to us, so we have to manage those environments.

I found myself in this situation a few years ago. A personal example.

Has anyone ever spent an incredible amount of time, put their heart and soul into a hobby or passion that they would call a business, but no one paid any attention and never made a dime?

OK, I spent four years there trying to start this Live Your Legend movement to help people do work that truly cares and inspires them. I was doing all I could but there were only 3 people paying attention and they were fine. Mother, father and wife Chelsea.

Thank you for your support.

(Applause.) This is what I really wanted, four years of zero percent growth, and I was about to shut it down. Right around that time, I moved to San Francisco and started meeting some very interesting people with crazy lifestyles of adventures, businesses, websites, blogs, etc., who surround themselves with passions and help people in meaningful ways.

One of my friends now has a family of 8 and blogs twice a week to support them all.

They have just returned from a month in Europe and are all set.

I was shocked by this. How does this even exist?

And seeing this I was incredibly inspired and decided not to close it but to take it seriously.

And I did everything I could to spend my time, every waking hour chasing them, hanging out, drinking beer, training, whatever.

And after four years of zero growth, Live Your Legend's community grew tenfold within six months of interacting with these people.

And it increased 160 times in 12 months.

And now, over 30,000 people in 158 countries use our careers and connections tools every month.

And they make up a community of passionate people who inspired the possibilities I dreamed of with Live Your Legend many years ago.

People change everything, and this is why - ask what was going on.

Well, for four years, I didn't know anyone in this space, I didn't even know this space existed, I didn't know that people could do this, that they could exercise like this.

And I'm here in San Francisco, and everyone around me was doing it.

As it became the norm, my thoughts changed from "How can I do that?" to "How can I not?"

And as soon as that happens, it flips a switch in your head that ripples through your entire world.

And without even trying, your criteria move from here to here.

No need to change your goals. Just change your environment.

That's why I love being around this whole group, going to every TED event I can and watching events on my iPad during my commute, whatever it is.

Because this is a group of people who inspire possibility.

We can spend the whole day together and we have plenty of other time.

In summary, these three pillars have one thing in common above all else.

We have 100% control over them.

No one says you can't learn about yourself.

No one can say you can't go beyond your limits, learn your own impossibilities, and go beyond them.

No one can say you can't surround yourself with people who inspire you, or stay away from those who bring you down.

You can't control a recession.

You can't control getting fired or getting into a car accident.

Most things are completely out of our control.

These three are entirely our responsibility and we can change the whole world if we decide to do something about it.

And importantly, it's starting to happen on a broader level.

I just read on Forbes that for the first time in a month, the US government has reported that more people are leaving than they are being laid off.

They thought this was an anomaly, but it happened three months in a row.

In an era that people claim is harsh in some ways, people are giving up the middle finger to live on this script, what they say people should do, in exchange for what is important to them and what inspires them.

And the problem is that people are waking up to this possibility. The only thing that limits the possibilities now is your imagination.

It's no longer a cliche.

It doesn't matter to me what you're into, what your passions are, what your hobbies are.

If you're interested in knitting, you can find people who are into knitting and learn from them. Wild.

And that's what this day is all about, learning from the people you're talking to, and we profile these people on Live Your Legend every day, because normal people are doing extraordinary things, and when we can be with them, it becomes normal.

And this is not about becoming Gandhi or Steve Jobs and doing something crazy.

It's about doing what's important to you and making an impact that only you can make.

Speaking of Gandhi, as I've heard the term, he was a recovering lawyer, and he was called to a greater purpose, something that was important to him and that he was unable to fulfill.

And he has this word that I absolutely believe.

"First they ignore you, then they laugh at you, then they fight you, then you win."

Everything was impossible until someone did it.

Either you surround yourself with people who say it's impossible and you're foolish to try, or you surround yourself with people who inspire possibilities, people in this room.

Because we believe it's our responsibility to show the world that what seems impossible can become the new normal.

And it's already starting to happen.

First, do what inspires us. Then we can inspire others too.

But if you don't know what you're looking for, you won't find it.

We have to do the work ourselves, work on it intentionally, and make those discoveries.

Because I imagine a world where 80% of people love their jobs.

What is it like?

What is innovation like? How would you treat the people around you?

Things will start to change.

Last but not least, I have one question for you guys. I think that's the only question that matters.

And what is it that you cannot do?

Discover it, live it. Not just for you, but for everyone around you. Because that is the beginning of changing the world.

What is the job you can't do without?

Thank you guys

(applause)

Last year, I participated in a book tour for the first time.

In 13 months, I flew to 14 countries and gave about 100 talks.

Every talk in every country started with a self-introduction and, sadly, every self-introduction started with a lie: "Taye Selasi is from Ghana and Nigeria" or "Taye Selasi is from England and America".

Every time I heard that opening sentence, I thought, "But that's not true," whichever country comes to the conclusion, whether it's the UK, the US, Ghana, or Nigeria.

Yes, I was born in England and raised in America.

My mother was born in England, raised in Nigeria and now lives in Ghana.

My father was born in the British colony of Gold Coast, grew up in Ghana, and has lived in the Kingdom of Saudi Arabia for over 30 years.

Therefore, even the introducer called me "multinational".

"But Nike is a multinational company," I thought, "I'm human too."

Then one fine day, in the middle of a tour, I went to a museum in Louisiana, Denmark, where I shared the stage with writer Colum McCann.

We were discussing the role of locality in writing, and then suddenly it hit me.

I am not multinational.

I am not a citizen at all.

How could I come from a certain country?

How do humans emerge from concepts?

It's a question that has haunted me for 20 years.

From newspapers, textbooks, and conversations, I was learning to talk about nations as if they were eternal, singular, and naturally occurring, but I wondered. By saying that I am from that country, I am implying that the country is an absolute, specific fixed point in time, a fixed thing, right?

Countries such as Czechoslovakia have disappeared in my lifetime. Appearance -- Timor-Leste. Failed -- Somalia.

My parents were from countries that didn't exist when they were born.

For me, nations, things that can be born, die, expand and contract, did not seem to me to be the basis for understanding human beings.

Therefore, discovering a sovereign state brought a great sense of relief.

What we call states are actually various expressions of sovereign states, and this idea was in vogue just 400 years ago.

When I learned this when I started my master's degree in International Relations, I felt a kind of relief.

It was exactly as I expected.

History is real, culture is real, but nations are invented.

Over the next ten years, I sought to redefine or dedefine myself, my world, my work, my experience beyond the logic of the state.

In 2005, I wrote an essay, What is an Afropolitan, outlining an identity that privileged culture over country.

It was very inspiring how many people could relate to my experience, but it was instructive how many did not accept my self-consciousness.

One commentator questioned: "How can Ms Selasi claim to be from Ghana when she knows nothing of the humiliation of traveling abroad with a Ghanaian passport?"

To be honest, I knew exactly what she meant.

I have a friend named Layla who was born and raised in Ghana.

Her parents are third generation Lebanese Ghanaians.

Leila, who speaks fluent Tui, knows Accra well, but when I first met her a few years ago, I thought she wasn't from Ghana.

In my mind, I consider her to be from Lebanon, despite the obvious fact that all her formative experiences took place outside Accra.

I, like my critics, imagined a Ghana where all Ghanaians had brown skin and not a single person had a British passport.

I had fallen into the restrictive trap set by the language of being from different nations, a trap in which reality, fiction over human experience, idiosyncratic nations were privileged.

I spoke with Colum McCann that day and the penny finally fell.

"Every experience is local," he said.

"All identities are experiences," I thought.

"I am not a citizen," I proclaimed on stage.

"I am local. I am multilocal."

It is not true that "Taye Selasi is from the United States".

I have nothing to do with the United States, all 50 countries.

My relationship is Brookline, the town where I grew up. New York City where I started working. With Lawrenceville, where I spend Thanksgiving.

What makes America home to me is not passports or accents, but these very specific experiences and the places where they happen.

I have pride in Ewe culture, black stars and Ghanaian cuisine, but I have never been involved with the Republic of Ghana on a large scale.

My relationship is between Accra, where my mother lives and goes every year, and Zorwul's little garden where my father and I talk for hours.

These are the places that shape my experience.

My experience is where I come from.

What if instead of asking "Where are you from?" -- "Where are you from?"

Then we will find out more about who we are and how similar we are.

Say you're from France, huh, is that a cliché?

A Dangerous Monologue of Adice, a Myth of the French State?

Tell me you're local to Fez and Paris, preferably Good d'Or. You can see the series of experiences.

Our experience is our starting point.

So where are you from?

I suggest a 3 stage test.

I call these the three "R's". Rituals, relationships, restrictions.

First, think about your daily ritual, whether it's brewing coffee, driving to work, harvesting crops, or praying.

What kind of rituals are these?

where does it occur?

In what cities around the world do shopkeepers know your face?

As a child, I had a fairly standard suburban ritual in Boston, but it was tailored to the ritual my mother brought from London and Lagos.

We took off our shoes in the house, were always polite to our elders, and ate slow-cooked, spicy food.

In snowy North America, our ritual was that of the Global South.

When I first went to Delhi and southern Italy, I was amazed at how at home I felt.

The ritual was familiar.

"R" number one, ritual.

Now think about your relationships, the people who shape your day.

Who do you talk to at least once a week, in person or on FaceTime?

Please be reasonable in your evaluation. I'm not talking about your Facebook friends.

I'm talking about the people who shape your weekly emotional experience.

My mother in Accra, my twin sister in Boston, my best friends in New York, these relationships are home to me.

"R" number two, relationships.

We are in an area of ​​rituals and relationships, and how we experience that area depends in part on our limitations.

The restrictions are where you can live.

which passport do you have?

Are you restricted, for example by racism, from being completely at home where you live?

Is it because of civil war, dysfunctional governance, economic inflation, living in a neighborhood where you practiced rituals as a child?

It's not the sexiest of R's, and it's less lyrical than rituals and relationships, but the question takes us past the "where are you now?"

"Why aren't you there and why?"

Rituals, relationships, restrictions.

Take a piece of paper and put these three words on the three columns and fill them out as honestly as possible.

An entirely different picture may emerge of your life in the local context, of your identity as a series of experiences.

Let's try it.

I have a friend named Ol.

he is 35 years old.

His parents were born in Nigeria and came to Germany on a scholarship.

Orr was born in Nuremberg and lived there until the age of ten.

When his family moved to Lagos, he studied in London and then came to Berlin.

He loves going to Nigeria, he loves the weather, the food and his friends, but he hates Nigeria's political corruption.

Where are you from?

I have another friend named Udo.

He is also 35 years old.

Udo was born in Cordoba, in northwestern Argentina. My grandparents immigrated from Germany (now Poland) after the war.

Udo studied in Buenos Aires and came to Berlin nine years ago.

He loves going to Argentina, he loves the weather, the food and his friends, but he hates Argentina's economic corruption.

Where is Mr. Udo from?

Udo, with his blond hair and blue eyes, passes as German, but he holds an Argentinian passport and needs a visa to live in Berlin.

Udo's Argentinian origins have a lot to do with history.

Being a native of Buenos Aires and Berlin, it's a matter of life.

Oru, who looks Nigerian, needs a visa to visit Nigeria.

He speaks Yoruba with an English accent and English with a German accent.

But to claim that he is "not really Nigerian" is to deny his experiences in Lagos, the rituals he has practiced since childhood, and his relationships with family and friends.

Oru, on the other hand, has always felt restricted there, especially by the fact that he is gay, although Lagos is definitely one of his hometowns.

Both he and Udo are restricted from living where the most meaningful ceremonies and relationships take place due to the political situation in their parents' countries.

To say that Oru is from Nigeria and Udo is from Argentina distracts from their common experience.

Their rituals, relationships and restrictions are the same.

Of course, when asked, "Where are you from?"

I am using a kind of shorthand notation.

It's quicker to say 'Nigeria' than 'Lagos and Berlin', and like Google Maps, you can always zoom in from country to city to neighborhood.

But that's not the point.

What is the difference between "Where are you from?"

And "Where are you from?"

It's not the specificity of the answer. That's the intent of the question.

Replacing the language of nationality with the language of the region asks us to shift our focus to where real life is happening.

Even the World Cup, which is the brightest expression of national identity, has mostly national teams made up of multiple local players.

The country simply does not work as a unit for measuring human experience.

That's why Orr says, "I'm German, but my parents are from Nigeria."

The "but" in this sentence confirms the unit's inflexibility that a fixed imaginary entity collides with another entity.

“I am a local of Lagos and Berlin,” suggests overlapping experiences, layers of merging that cannot be denied or removed.

You can take my passport, but you can't take my experience.

what you have inside yourself.

Wherever I go, I can tell where I am from.

Don't get me wrong, I'm not saying that the state should be abolished.

There is much to be said about the history of nations, and even more about sovereign nations.

Culture exists in community, and community exists in context.

Geography, tradition, collective memory, these are important.

What I'm wondering about is dominance.

Every self-introduction during the tour started with a mention of my country, as if knowing where I was from would tell the audience who I am.

But what are we really asking when someone asks where they are from?

And what do we actually see when we hear the answer?

Here is one possibility. Basically, a country represents power.

"Where are you from?" Mexico. Poland. Bangladesh. less power.

America. Germany. Japan. more power.

China. Russia. Ambiguous.

(Laughter) Especially in multiethnic settings, we can be playing power games without realizing it.

As any recent immigrant knows, the question "Where are you from?" or "Where are you really from?"

is often the code "Why are you here?"

Then there is the book written by scholar William Deresewitz about America's elite universities.

"Students see their background as diverse if they're from Missouri or Pakistan. They don't care if their parents are all doctors or bankers."

I'm with him

Calling one student American and another Pakistani, and triumphantly claiming diversity in student bodies, ignores the fact that these students are local residents of the same environment.

The same is true on the other end of the economic spectrum.

A Mexican gardener in Los Angeles and a Nepalese housekeeper in Delhi have much more in common in terms of rituals and restrictions than nationality suggests.

Perhaps my biggest problem when coming from another country is the myth of returning to that country.

I am often asked if I intend to 'go back' to Ghana.

I go to Accra every year, but I can't "go back" to Ghana.

Not because I wasn't born there.

I can't go back to my father anymore.

The country where he was born, that country no longer exists.

You can't go back to a place and find out exactly where you left it.

Something, somewhere, will always be changing, especially ourselves.

people.

Finally, we are talking about the human experience, this notorious and glorious chaos.

In creative activities, locality represents humanity.

The more you know about the story's setting, the more color and texture it will bring to the area, and the more human and sympathetic the characters will become.

Myths about national identity and origin vocabulary confuse us and position ourselves in mutually exclusive categories.

In fact, we are all multi, i.e. multilocal, multilayered.

I believe that if we recognize this complexity and start a conversation, we can get closer instead of closer together.

So next time I'm introduced, I'd love to hear the truth: "Taye Selasi is human just like everyone here.

She is not a citizen of the world, but a citizen of the world.

She is a local of New York, Rome and Accra. ”

thank you.

(applause)

It has allowed me to travel to amazing places and photograph remote landscapes and remote cultures around the world.

i love my job

But while people think it's a series of flashes and sunrises and rainbows, it's actually something much more similar.

(laughs) This is my office.

We can't afford fancy places to stay for the night, so we often sleep outdoors.

If you can keep it dry, that's a bonus.

I can't afford to go to fancy restaurants.

As such, we tend to eat whatever is on the local menu.

And if you're in Paramo, Ecuador, you'll likely be eating a large rodent called a cuy.

(Laughter.) But what makes our experience perhaps a little different and a little more unique than the average person's experience is that even in the darkest moments and despair, there's something nibbling in the back of your mind thinking, "Oh, there might be an image to be made here, there might be a story to be told."

And why is storytelling important?

Yes, it helps us connect with our cultural and natural heritage.

And in the southeast there is an astonishing disconnect between the natural area and the public that allowed us to be here in the first place.

We are visual creatures, so we use what we see to teach what we know.

Most of us are not willing to go to the swamps now.

So how can we expect those same people to represent and defend their protection?

Can not do that.

My job, therefore, is to use photography as a communication tool, to help bridge the gap between science and aesthetics, to make people talk, think, and hopefully ultimately have compassion.

I started this 15 years ago here in my backyard in Gainesville.

And I fell in love with adventure and discovery, exploring all the different locations just minutes from my front door.

There are many beautiful places.

After all these years, I still see the world through the eyes of a child, and I try to incorporate that sense of wonder and curiosity into my photography as often as possible.

And we're pretty lucky because here in the South we're still blessed with a relatively blank canvas to fill with the fanciest adventures and incredible experiences.

The question is how far our imagination can take us.

You see, a lot of people look at this and say, "Oh, wow, that's a pretty tree."

But I'm not just looking at trees. I see an opportunity when I look at this.

I can see the whole weekend.

Because when I was a kid, these images gave me the courage to get off the couch, challenge myself to explore, go in search of the woods, put my head in the water and see what was out there.

And folks, I've taken pictures all over the world, but I promise you, what's here in the South, in the Sunshine State, rivals anything I've ever seen.

But still our tourism industry is busy advertising the wrong things.

By age 12, most kids have been to Disney World more times than canoeing or camping under the stars.

And I have nothing against Disney or Mickey. I used to go there too.

But they have lost the fundamental connection that creates a true sense of pride and ownership of the place they call home.

And this situation is compounded by the problem that the landscapes that define our natural heritage and fuel our drinking water aquifers are seen as terrifying, dangerous and eerie.

When our ancestors first came here, they warned, "Keep away from this area, there are ghosts.

They are full of evil spirits and ghosts. ”

I don't know where they came up with that idea.

But it actually creates a very real disconnect, a very real negative psychology that keeps the public apathetic and silent and ultimately endangers our environment.

We are a state surrounded by water, surrounded by water, but for centuries swamps and marshes have been viewed as obstacles to overcome.

So we have treated them as secondary ecosystems. Because they have little monetary value and of course they are known to be home to alligators and snakes. Admittedly, these aren't the cutest ambassadors.

(Laughter.) So it came to be thought that the only good swamp was a drained swamp.

And in fact, draining swamps for agriculture and development was not long ago thought to be the essence of nature conservation.

But now we are going backwards. Because the more we know about these wet landscapes, the more secrets are beginning to be unlocked about interspecies relationships and connections between habitats, watersheds and flyways.

For example, consider this bird. This is the original syllable warbler.

i love this bird Because this bird is a swamp bird. Because they are swamp birds everywhere.

They nest, mate, and breed in primeval swamps in flooded forests.

And when spring ends, after raising the chicks, they fly thousands of miles across the Gulf of Mexico to reach Central and South America.

And when winter ends, they return when spring comes.

They fly thousands of miles over the Gulf of Mexico.

And where are they going? where will they land?

Soon we were back in the same tree.

That's strange.

This is a bird the size of a tennis ball. I mean, it's crazy!

I used GPS to get here today, this is my hometown.

(laughs) It's crazy.

So what happens when this bird flies over the Gulf of Mexico to Central America for the winter, then flies away in the spring, and returns to this place, the newly-turfed golf course?

This is a story all too commonly unraveled in this state.

And this is a natural process that has been happening for thousands of years and we are just learning about it.

So you can imagine all we have to learn about these landscapes just by preserving them first.

Despite the abundance of life in these swamps, they remain infamous.

Many people find the idea of ​​stepping into Florida's Blackwater uncomfortable.

It is understandable.

But what I love about growing up in the Sunshine State is that many of us live with a latent but tangible fear that when we put our toes in the water, there is something much older and much more adapted than us.

Knowing you're not top notch is a welcome annoyance.

In this modern urban digital age, how often do you feel vulnerable or wonder if the world wasn't made just for us?

So over the last ten years, I've started looking for areas where concrete turns into forests and pines into cypresses. And I take all these mosquitoes and reptiles, all these annoyances, as an affirmation that I have found true nature, and I fully embrace them.

As a blackwater-obsessed conservation photographer, it's no surprise that I end up on the most famous swamp: the Everglades.

Growing up here in North Central Florida, I was always given enchanting names like Loxahatchee, Fakahatchee, Corkscrew, and Big Cypress.

I started a five-year project in hopes of reintroducing the Everglades from a new, more inspired perspective.

But we knew this was a tall order. Because we have an area about one-third the size of the state of Florida, which is huge.

And when I say the Everglades, most people think, "Oh yeah, it's a national park."

But the Everglades are more than just parks. Starting in the Kissimmee Lakes in the north, when it rains in the summer, the torrential rains flow into Lake Okeechobee, which fills, overflows its banks, and slowly overflows southwards as it conforms to the terrain, entering the grassy river Sawgrass Meadow, then joins the cypress cuts, and continues further south into the mangroves. We cross marsh after swamp, and finally—finally—we arrive at Florida Bay, the emerald jewel of the Everglades, the great estuary, the 850-square-mile estuary.

Granted, this national park is at the southern end of the system, but everything that makes this national park unique is these inflowing inputs: freshwater starting 160 miles north.

Therefore, these political and invisible boundaries cannot protect parks from polluted or scarce water.

And unfortunately, that's exactly what we ended up doing.

Over the past 60 years we have drained, dammed and dredged the Everglades, but now only a third of the water that once reached the bay now reaches the bay.

So, unfortunately, this story isn't all sun and rainbows.

For better or worse, the story of the Everglades is inherently tied to the peaks and valleys of the relationship between humans and the natural world.

But you might be interested too, so I'll show you these beautiful pictures.

You can tell a real story while getting your attention.

It's that we've got this and we're trading it for this at an amazing rate.

And what so many people have lost is the sheer scale we're talking about.

Because the Everglades aren't just responsible for drinking water for 7 million Florida residents. Today, it also provides more than 300 million Americans with farmland to grow tomatoes and oranges year-round.

And it's the same summer season water pulsation that made the Grass River 6,000 years ago.

Ironically, today, more than 500,000 acres of endless sugarcane rivers are also responsible here.

These are the same fields that are dumping very high levels of fertilizer into the watershed and causing the system to change forever.

However, in order to not only understand how this system works, but also to get you personally involved with this system, I decided to split the story into several different narratives.

And I wanted to start that story at the heart of the Everglades system, Lake Okeechobee.

For that reason, I chose the symbolic presence of Ambassadors.

This is the Evergrade Snail Kite.

This is a magnificent bird, once home to thousands of birds in the northern Everglades.

And today, the number of nesting pairs has dwindled to about 400 birds.

why?

That's because they eat their only food source, the apple snail, an aquatic gastropod about the size of a ping-pong ball.

So when we started damming the Everglades, levitating Lake Okeechobee, and draining the wetlands, we lost snail habitat.

As a result, the black kite population was declining.

So I wanted a picture that not only conveys the relationship between the wetland, the snail and the bird, but how wonderful this relationship is and how important it is for this healthy wetland and this bird to depend on each other.

To that end, I brainstormed this idea.

I began sketching these plans for photography and sent them to wildlife biologists in Okeechobee. This is an endangered bird, so special permits are required to photograph it.

So I built this underwater platform where you can place the snail right under the water.

And I spent months planning this crazy idea.

And I took this platform to Lake Okeechobee and spent over a week in waist-deep water on nine-hour shifts from morning to dusk to get the one image that I think might tell this.

And this is the day it finally worked. [Video: (narrated by Mack Stone) After setting up the platform, I looked away and saw a kite flying over the cattail.

And I see him scanning and searching.

And he survived the trap, and I know he saw it.

And he goes straight to the trap.

And in that moment, all those months of planning, waiting, sunburns and mosquito bites suddenly become worth it.

(Mac Stone in the movie) Oh my god, I can't believe it!] You can believe how excited I was when that happened.

But the idea is that for those who have never seen this bird and have no reason to care about it, these photos, these new perspectives, can help shed a little new light on the one species that makes this watershed so incredibly valuable and so important.

Now, I know I can't come here to Gainesville and talk about the animals of the Everglades without talking about alligators.

I love gators and grew up loving them.

My parents always said I had an unhealthy relationship with alligators.

But what I like about them is that they are the equivalent of freshwater sharks.

They are feared, hated, and tragically misunderstood.

They are a unique species, so they are not just apex predators.

In the Everglades, they really are the architects of the Everglades. This is because when the water falls in winter during the dry season, they start digging holes called gator holes.

And they do so because they can stay wet and feed when the water goes down.

And now, not only does this affect them, but other animals also rely on this relationship, making them a keystone species as well.

So how do you make ancient reptiles, apex predators, seem to dominate the system while simultaneously appearing vulnerable?

Well, when you step into a hole with about 120 of them, you'll hope you made the right decision.

(Laughs) I still have all my fingers, it's cool.

But I know, I know, I'm not going to rally you guys, I'm not going to rally your army to "Save the Everglades for Alligators!"

it won't happen. Because they're so ubiquitous, we're seeing them now, and they're one of the great success stories of U.S. protection.

But there is one species in the Everglades that everyone can't help but love. It's a Roseate Spoonbill.

These birds are wonderful birds, but they have had a very hard time in the Everglades. Originally nesting in thousands of breeding pairs in the Florida Bay, by the early 20th century the population had dwindled to just two breeding pairs.

why?

This is because women thought wearing hats looked better than flying.

After that, we banned plume trade and the numbers started to recover.

And when their numbers started to recover, scientists started paying attention to these birds and started studying them.

They found that these bird behaviors were intrinsically tied to the Everglades' annual water decline cycles, which define the Everglades watershed.

They discovered that these birds began nesting in the winter when the water receded. Because they feed by touch, they must touch what they eat.

And they wait to be able to feed their children in sufficient quantities in these fish-intensive pools.

Thus, these birds have become very emblematic of the Everglades, indicator species of the health of the system as a whole.

And we started draining the southern Everglades just as that number recovered and surged to 900, 1,000, 1,100, 1,200 in the mid-20th century.

And two-thirds of that water stopped moving south.

And it had dramatic results.

And just as those numbers were beginning to peak, unfortunately today, the true story, real pictures, of spoonbills looks like this:

And we messed up the system so much that there are now fewer than 70 nesting pairs in Florida Bay.

So all these different organizations are shouting, "The Everglades are fragile! Fragile!"

it is not.

Elastic.

Because despite all we've gotten, despite all we've done, despite draining and damming and dredging, some of it is still here, waiting to be put back.

And this is what I love about South Florida. It is the unstoppable forces of mankind meeting in one place the immovable object of tropical nature.

And in this new realm, we are forced to make new assessments.

What is the wilderness worth?

What is the biodiversity value of our drinking water?

And fortunately, after decades of debate, we are finally beginning to address these questions.

We are gradually working on these projects to bring more freshwater back into the bay.

But it is up to us, as citizens, residents and administrators, to make our elected officials keep their promises.

What can you do?

It's that simple.

Get out anyway, get out.

Bring your friends, bring your kids, take your family out.

Hire a fishing guide.

Show states that conservation makes sense not only ecologically, but economically as well.

It's a lot of fun, so please give it a try. Please put your feet in the water.

The swamp will change you, I promise.

Over the years, we've grown so generous with other landscapes across the country, including the Grand Canyon, Yosemite, and Yellowstone, all masked by our American pride, the places we now think define us.

And we use these parks and natural areas as beacons and cultural compass.

And sadly, the Everglades are too often left out of the conversation.

But I believe this place is just as iconic as any other wilderness and represents who we are as a country.

It's just another kind of wild.

But I am encouraged. Because what was once considered a wetland wilderness is today a World Heritage Site.

It is a wetland of international importance.

And we've come a long way in the last 60 years.

And as the world's largest and most ambitious wetland restoration project, we at the Sunshine State are drawing international attention.

Because if we can restore this system, it will be a symbol of wetland restoration around the world.

But it's up to us to decide which heritage to flag.

They say the Everglades are our biggest challenge.

If we pass it, we can save the planet.

I love this word because it is a challenge and a driving force.

can you do it? do we do that?

I have to, I have to

But the Everglades are more than just an ordeal.

It is both a gift and ultimately our responsibility.

thank you.

(applause)

Over the past year, everyone has been watching the same shows, but I'm not talking about Game of Thrones, but about the terrifying real-life drama that turned out to be so compelling that I couldn't put it down.

It's a show produced by a killer and shared worldwide through the internet.

Their names have become well known: James Foley, Stephen Sotloff, David Haynes, Alan Henning, Peter Kasig, Haruna Yukawa and Kenji Goto Jogo.

Their decapitation by the Islamic State was barbaric, but if you think they are old-fashioned from a time long ago and obscure, you are mistaken.

They were uniquely modern because the killers acted knowing that millions of people would watch them.

Headlines called them barbarians, barbarians. Because the image of one man overpowering another and killing him with a knife to his throat is consistent with our idea of ​​an ancient, primitive practice that is the exact opposite of our urban, civilized ways.

we don't do that.

But it's ironic.

We think decapitation is irrelevant to us, even when we click and watch the screen.

But it concerns us.

Islamic State beheadings are neither ancient nor distant past.

This is a global 21st century event, a 21st century event in our living rooms, desks and computer screens.

They rely entirely on the power of technology to connect us.

And all viewers are part of the show, whether they like it or not.

And many people are watching.

I don't know the exact number.

True, it is difficult to calculate.

But a poll in the UK in August 2014, for example, estimated that 1.2 million people watched James Foley's beheading scene in the days following its release.

That's the first few days, and only in the UK.

A similar poll in the United States in November 2014 found that 9% of those surveyed had seen a beheading video, and another 23% had watched the video but stopped watching it just before the death appeared.

Nine percent of those who got to see it may be a minority, but it's still a very large audience.

And of course, that audience is growing all the time as more people keep downloading and watching it every week and every month.

A similar story was told 11 years ago, before sites like YouTube and Facebook were born.

Videos of them aired during the Iraq War when innocent civilians like Daniel Pearl, Nick Berg, and Paul Johnson were decapitated.

Nick Berg's beheading quickly became one of the most searched items on the Internet.

Within a day, it became the top search term across search engines like Google, Lycos, and Yahoo.

In the week after Nick Berg's beheading, these were the top 10 search terms in the United States.

Berg's beheading video was the most popular search term for the week and the second most popular search term for the entire month of May, behind "American Idol."

An al-Qaeda-related website that originally published Nick Berg's beheading was forced to shut down within days due to heavy traffic to the site.

One Dutch website operator said daily viewership increased from 300,000 to 750,000 each time a beheading scene was shown in Iraq.

Eighteen months later, he told reporters that although it had been downloaded millions of times, it was just one website.

A similar pattern was seen over and over again when videos of beheadings were released during the Iraq War.

Thanks to social media sites, these images are more accessible than ever, but a step back in history shows that cameras were the first to create a new kind of crowd in the history of decapitation as a public spectacle.

As soon as the camera appeared on the scene long ago, on June 17, 1939, it had an immediate and tangible impact.

On that day, the first public beheading film was made in France.

It was the execution, the guillotine, of the German serial killer Eugen Weidmann outside the Saint-Pierre prison in Versailles.

Weidman was scheduled to be executed at dawn, as was customary at the time, but the executioners were unfamiliar with the task and underestimated how long the preparations would take.

Weidman's execution was therefore carried out at 4:30 a.m., although on June morning there was sufficient light at that point to take pictures, and onlookers in the crowd filmed the proceedings without the authorities' knowledge.

Some still photos were also taken, and you can still watch movies and view photos online today.

The crowd on the day of Weidmann's execution was called "unruly" and "disgusting" by the press, but that was nothing compared to the millions of people who could observe the deeds in minute detail over and over again in freeze-frame.

These scenes may be more accessible than ever thanks to the camera, but it's not just about the camera.

If we go further back in history, we can see that as long as there have been public judicial executions and beheadings, there have been crowds to watch them.

In early 19th century London, there may have been 4-5,000 people to see a standard hanging.

It may take 40,000 or 50,000 people to see a famous criminal killed.

And decapitation, which was rare in England at the time, attracted even more people.

In May 1820, five men known as the Cato Street Conspirators were executed in London for plotting to assassinate a British government official.

They were hanged and then decapitated.

It was a ghastly sight.

One by one, their heads were cut off and pushed up by the crowd.

100,000 people came to watch the game, 10,000 more than Wembley Stadium could accommodate.

The streets were busy.

People were renting windows and roofs.

People were climbing carts and wagons on the streets.

People climbed the lamppost.

It was known that people would die of crushing on the day of the popular execution.

Evidence suggests that throughout the history of public beheadings and public executions, the majority of those who come to watch are either enthusiastic or, at best, immobile.

Disgust is relatively rare, and when people are disgusted and terrified, they don't necessarily stop going out and watching in the same way.

Perhaps the most striking example of the human capacity to be unfazed, even disappointed, at the sight of a beheading was the introduction in France in 1792 of the famous beheading machine, the guillotine.

To us in the 21st century, the guillotine may seem like a gigantic device, but to the crowd seeing it for the first time, it was actually a disappointment.

They were accustomed to seeing long torturous executions on scaffolds where people were mutilated, burned and slowly torn apart.

For them, watching the guillotine in action, it was too fast and there was nothing to see.

The blade fell, the head fell into the basket, and was soon out of sight. And they shouted, "Give me my gallows, give me back my wooden gallows!"

The disappearance of torturous public judicial executions in Europe and the United States was partly because they became more humane to criminals, but partly because crowds stubbornly refused to act as they should.

Execution days were often more like carnivals than solemn rituals.

Today, public judicial executions are unthinkable in Europe or the United States, but the situation is different now, and there are other scenarios where we should be wary of thinking that we would act like that again.

Consider, for example, a suicide lure case.

This was when a crowd gathered to see a man who had climbed to the roof of a public building to commit suicide, and the crowd yelled, "Go for it! Jump off!"

This is a well-known phenomenon.

A 1981 paper found that 10 out of 21 suicide threats involved suicidal attempts or jeering from the crowd.

And this year, too, there was an incident that was reported in the media.

This was a highly publicized incident in Telford and Shropshire in March of this year.

And as it happens today, people take pictures and videos with their phones and post those videos online.

When it comes to brutal killers posting beheading videos, the internet has created a new breed of crowd.

Today, the action takes place in a distant time and place, which gives the viewer a sense of detachment, a sense of detachment, from what is happening.

It doesn't matter to me.

it's already happening.

It gives us a sense of intimacy like never before.

Everyone was given a front row seat today.

We can all watch privately in our own time and space, and no one needs to know you clicked on the screen to watch.

This sense of detachment from others and the event itself seems to be the key to understanding our ability to observe. There are several ways that the Internet creates a sense of separation that erodes personal moral responsibility.

What we do online is often contrasted with real life, as if what we do online somehow lacks reality.

When interacting online, we feel less responsible for our actions.

Because of our sense of anonymity and invisibility, we feel less responsible for our actions.

The Internet has also made it easier for us to inadvertently encounter things that we tend to avoid in our daily lives.

Today, videos can start playing before you know what you're watching.

Or you may be tempted to look at material that you wouldn't see in your daily life or if you were with other people at the time.

And when the act is pre-recorded and takes place in distant time and space, viewing seems like a passive activity.

I can't do anything now.

it's already happening.

All of this makes it easy for us, as Internet users, to give in to our curiosity about death, push our personal boundaries, test our sense of shock, and explore our sense of shock.

But we are not passive when we see.

On the contrary, we satisfy the murderer's desire to be seen.

When a decapitated victim is restrained and left unprotected, he or she essentially becomes a pawn in the killer's show.

Unlike a battle-won trophy head, which represents the luck and skill necessary to win a battle, when decapitation is staged, when it is essentially part of the play, the power comes from the reception the killer receives during the performance.

In other words, watching is part of the event.

Events no longer take place at a single point in time, as they used to, and still seem to.

Now the event has expanded in time and place, and everyone in the audience has their part.

I should stop watching, but I know I won't.

History teaches us not to, and killers know it too.

thank you.

(Applause) Bruno Giussani: Thank you. Please let me take this back. thank you.

Let's move here. While we're gearing up for our next performance, I'd like to ask a question that many of you here may have. How did you become interested in this subject?

Francis Larson: I worked at a museum in Oxford called the Pitt Rivers Museum. It was famous for its display of shrunken heads from South America.

People used to say, "Well, it's a nape museum, it's a nape museum!"

At the time, I was working on the history of the scientific collection of skulls.

I was working on a collection of skulls, and I found it ironic that all the while people were coming here to see this gory, primitive, barbaric culture, and were mostly imagining and creating without really understanding what they were seeing, all the while these vast masses of skulls — hundreds of thousands of skulls in museums across Europe and America — seemed to support a kind of Enlightenment pursuit of scientific rationality.

So I kind of twisted it and wanted to say, "Let's take a look at us."

We are looking at these shrunken heads through a glass case.

Let's take a look at our own history and our own cultural fascination with these things.

BG: Thanks for sharing that.

Florida: Thank you.

(applause)

When I was only three or four years old, I fell in love with poetry, the rhythm of language, and music. Poetry, with its power of metaphor and imagery, is the essence of communication, of discipline, of distillation.

Many years later, the poems I read today are from my recently completed seventh volume.

Well, five years ago I was diagnosed with Parkinson's.

There is no cure yet, but advances in treatment are truly remarkable.

But you can imagine my dismay to find out that women are largely left out of research trials, despite the gender-specific medical findings that prove that we're not really just little men (laughter), we just happen to have different reproductive systems.

Gender-specific medicine works for men too.

But you put at stake the person you already have, including the momentum you've learned to invoke through passionate compassion and action. Both require as well as generate energy.

So, as an activist, I partnered with the Parkinson's Disease Foundation (pdf.org) to launch a major initiative to put women on the Parkinson's disease map.

And as a poet, I began to work on this subject, finding it tragic, hilarious, and sometimes even joyful.

I do not feel debilitated by Parkinson's disease. I feel distilled by it, and I actually like the woman I'm distilling on a lot.

"No signs of trouble" It takes tremendous willpower to grow small. I just sit in the doctor's waiting room, watching the future come and go, and lean forward. I will stare at you while trying not to look.

Exchanges are rare: a short, sarcastic smile of recognition.

You are new to this block.

Everyone here was once you.

You are still learning that growing small requires a mind as big as you are not yet at home with. I give way many times, but it won't stand up.

Have you ever swallowed the contents of a "Drink Me" bottle and felt yourself shrinking?

Now, it's only when you wrestle with your hands that familiar furniture shakes, floors tilt, and doorknobs break.

Decreased sleep at night, handwriting, voice, height, everything is getting smaller.

You are a Buddhist mystic, a calm, unbelievably shrinking woman rather than a woman who makes do with little.

Less is not more.

But in this empty space, space becomes sparkling and visible.

This is the place behind the eyes of those accustomed to what some call decay.

This is a place of unforgiving poetry, a gift of existence hitherto neglected and buried in the clutter of everyday life.

Here every action requires intention and consciousness is alive.

Nothing is automatic.

You can see it in things like taunting buttons, sticking your arms in your sleeves, and balancing over the darkness on curbs at night.

Who would doubt such a modest feat of courage that it is an intimate and intense discipline, a metaphysical exercise in constant awareness?

This understated strength is manifested in the staggering dancers who put forth extraordinary effort in a task most would consider trivial.

Here, in this quiet beauty, in this gentle voice and stiff limbs of my people. Such determination hidden by each calm face.

It takes an enormous amount to grow small enough to indulge in such unwavering grace.

(Applause.) Thank you.

This is what is called "On Donating My Brain to Science".

(laughs) No problem.

Skip all pages about reassuring religious people.

Kidneys, corneas, livers, lungs, tissues, hearts, veins, etc. are already universal donors.

It's strange that humble brains never imagined its unique value in research, and perhaps it might save others from what I'm not quite sure I have.

I'm happy about that.

Fill out the form, scrutinize the responses, and show your jolly spirit.

And slice me, dice me, and spread me on your slide.

Find out what I'm trying to say.

Earn me, learn me, scan me, squint through your lens.

Please clarify what I want to suggest if possible.

Be my guest, good luck, harvest me, track down clues.

This was a good brain while it was alive.

This was the brain that paid the price.

So slice me, dice me, smear it on a slide, smudge it, explain it, drain it like a cup.

Share me and listen: I want to be used, I want to be used, I want to be used.

(Applause) (End of applause) And this is called "Ghostlight."

Lighting from within is the only safe way to traverse dark matter.

Some life forms such as mushrooms, snails, jellyfish, and earthworms are bioluminescent, as are humans. We radiate infrared from our most transparent selves.

Our tragedy is that we do not see it.

We see through reflection.

Biofluorescence is required to show true color.

However, external lighting may cause distortion.

As gravity bends light, massive clusters of galaxies can act as telescopes, stretching the background image of star systems into faint arcs. This is a lens effect like looking at a distant streetlight through a wine glass.

A glass or two of wine makes me weave, as if I were playing the part of a drunkard. It was as if I could lurch down the city streets without rousing the gaze of all pedestrians, as if I was immersed in the unrequited love of the dynamic Turner canvases peeked at by Hubble.

Stare as long as you want.

If you think about it, walking, even standing, is illogical. Little things like that, such as feet. -- (laughs) Especially when the body is no longer al dente.

(Laughter) And I always thought Apollo, being an extreme, over-the-top creature, was a beautiful but boring, kind of goofy blonde.

The Dionysians do not balance.

In other words, balance has never been my forte.

But I did.

More and more, digression seems to be the most direct route out of where I've lost my place, my mind, my direction, my time.

The foot position is just right, so pay attention to how it rotates. Spin too fast and you may fall.

Take your time to guide the audience and say goodbye to the actors.

A ghostlight is what we call a single light bulb that hangs above the bare stage of an empty theater.

In such an empty theater of nights, when you awake you meet no external radiance, this is the last struggle left to be won, this is the only beacon to let the darkness in and start the rest, the lens through which to see both the self and the other, finally arrayed in the bright stain of original sin: illuminated from within.

(Applause.) And this is the end.

"This Dark Hour" End of summer, 4am.

The rain has slowly stopped, dripping softly from the broad leaves of the blue hosta, invisible in the darkness of the garden.

Barefoot, careful on smooth slate, no lights needed, I know the way, hunker down by a bed of mint, scoop up a handful of damp dirt, then fumble for a chair, spread my shawl and sit down, breathing in the moist green August air.

This is the brief, quiet time before you wake up, with newspapers dropping like grenades on your front door, phones chirping, and computer screens flashing.

I have this time. I have poetry in my head and dirt in my hands. It is an indescribable richness.

In this hour when the blood of my blood bones has flowed and the child has grown to adulthood, a stranger, intimate, not far away but lying safe, listening to the melody of dreams while love sleeps safely in his arms.

The immeasurable lightness of coming to this place and living in this moment.

Black density begins to fade to amber.

A cardinal's coloratura in the interim, then a lamentation of the dove.

Sable shines towards gray. An object appears and casts a shadow. Night ages towards day.

the city shakes.

There will also be dawn, night, and glorious noon.

Maybe you will get lost.

You will stumble, you will fall, you will curse the darkness.

No matter what happened, there was this time when nothing mattered and everything was just unbearably dear.

And if those who loved me were sad for too long when I finished the light of day, remember that I had this time, remember this dark and perfect time and laugh.

thank you.

(applause)

(Arabic) I seek refuge in Allah from the cursed Satan. In the name of Allah, Most Merciful and Most Merciful.

(English) I was born into a middle-class family.

My father passed away when I was five years old, and by the time I was born he was already a businessman.

But it made no difference to him whether the children would be boys or girls. They were going to school.

So I guess I was lucky.

My mother got pregnant 16 times.

Out of 16 pregnancies, 5 survived.

Imagine what I experienced as a child.

Every day I saw women being carried to the cemetery and children going to the cemetery.

When I graduated high school, I really wanted to be a doctor.

I wanted to be a doctor helping women and children.

So I finished my education, but I wanted to go to university.

Unfortunately, there were no girls' dormitories in my country, so I got accepted to medical school, but I couldn't go there.

As a result, my father sent me to America.

I came to America.

I have completed my education.

While I was finishing my education, my country was invaded by Russia.

And when I finished my education, I didn't know what was happening to my family and my homeland.

For months, years, I didn't know about it.

My family was in a refugee camp.

So as soon as I finished my education, I took my family to America.

I wanted them to be safe.

But where was my heart?

My heart was in Afghanistan.

Listening to the news every day and following what was happening in my country almost broke my heart.

I really wanted to go back to my home country, but at the same time, I thought I couldn't go there because I didn't have a place for myself.

You did a good job.

I was a university professor.

I made good money.

I had a good life.

my family was here.

I could live with them.

But I wasn't happy.

I wanted to go home.

So I went to a refugee camp.

When I went to a refugee camp in Pakistan, there were 7.5 million refugees.

7.5 million refugees.

About 90 percent of them were women and children.

Most of the men died in action or participated in the war.

When I went to the refugee camp every day to investigate, I discovered things you could never have imagined.

I saw a widow with five to eight children sitting there crying, not knowing what to do.

I saw a young woman who had nowhere to go, no education, no entertainment, no place to live.

I have seen young people who have lost their fathers, lost their homes, are 10-12 year old boys trying to support their families, and as heads of families they are trying to protect their sisters, their mothers and their children.

So it was a very devastating situation.

My heart was racing for my friends, but I didn't know what to do.

Then we talk about momentum.

It was then that I wondered what I could do for these people.

How can we help these people?

I am also an individual. what can i do for them?

But in that moment I knew that education changed my life.

it changed me. It gave me status.

It gave me confidence. It gave me a career.

It helped me support my family, take them to another country and keep them safe.

And at that moment, I knew that what I should give to my people was education and health, and I pursued it.

But do you think it was that easy?

No, because at that time girls' education was completely banned.

Also, Russia's invasion of Afghanistan has left people unable to trust anyone.

It was so hard to go and say, "I want to do this."

Who am I?

A person from America.

I am educated here.

did they trust me? of course not.

So we had to build trust in this community.

What should I do?

I've gone and researched and seen.

I asked.

Finally found a man.

he was 80 years old.

he was a mullah

I went to his tent in the camp and asked, "I would like to have you as a teacher."

And he looked at me and said, "Crazy woman, crazy woman, how do you think I can be a teacher?"

And I said to him, "I will make you a teacher."

Eventually he accepted my offer and word spread around the world when I started classes on his property.

In just one year, 25 schools were established and 15,000 children attended. It was amazing.

(Applause.) Thank you.

thank you.

But, of course, we were doing all the work and training teachers.

We were training women's rights, human rights, democracy and the rule of law.

We were doing all kinds of training.

And then one day I was in my office in Peshawar, Pakistan.

Suddenly I saw a staff member running into the room, locking the door and telling me to run away and hide.

And what are you doing as a leader?

Scary, isn't it? You know it's dangerous.

You know your life is in danger.

But as a leader, you have to get it together.

You have to put it together and show strength.

So I said, "What's going on?"

And these people flooded my office.

So I invited them to my office.

They came and there were nine of them, nine Taliban.

They were the ugliest men I have ever seen.

(Laughter) A group of very mean-looking people, dressed in black, in black turbans, stormed into my office.

Then I invited them to sit down and have some tea.

they said no. They are not going to drink tea.

And of course their tone of voice was very scary, but I was really trembling.

But at the same time, I had the strength to hold on to myself.

And of course, by then you'll know what I'm wearing - I'm wearing a black hijab from head to toe.

The only thing you see, my eyes.

They asked me, "What are you doing?"

Don't you know that girls' schools are forbidden?

what are you doing here? "

So I looked at them and said, "Where is the school? Where is the school?"

(Laughter.) (Applause.) And they looked at me and said, "You're teaching girls here."

I said, 'This is someone's house.

Some students are here, but they are all studying the Quran, the holy scriptures.

And the Koran says that if a woman learns the scriptures, she will be a good wife and will obey her husband. ”

(laughter) And let me tell you one thing. That's how you work with those people, and you know — (laughter) by then they started speaking Pashto.

They talked to each other and said, "Let's go, leave her alone, she'll be fine."

And when I offered them tea again this time, they took a sip and left.

By then, my staff had flooded into my office.

They were scared to death.

I don't understand why they didn't kill me.

I don't understand why they didn't take me.

But everyone was happy to meet me.

I was very happy and of course I was happy to be alive.

(laughs) Of course, I'm glad I'm alive.

But also, we have been training continuously during the fall of the Taliban, but of course during the fall of the Taliban there is another story.

We went underground to educate and train 80 girls, 3,000 underground students.

With the fall of the Taliban we moved into the countryside and opened a school after school.

Opened a study center for women.

We have continued to open clinics.

I worked with mothers and children.

Conducted reproductive health training.

I received every kind of training imaginable.

I was very happy I was satisfied with the results of my work.

Then one day, as I was heading north of Kabul with four trainers and a bodyguard, I was suddenly stopped in the middle of the road again by 19 young men.

Rifles on their shoulders, they blocked the road.

And I said to the driver, "What's going on?"

The driver then said, "I don't know."

he asked them. They said "we have nothing to do with you".

they called my name They said, "I want her."

My bodyguard came out and said, 'I'll answer you.

what do you want? "

They said "nothing". they called my name

By then the women were screaming inside the car.

I was very upset, but I told myself that this was no longer possible.

We will all be killed this time.

I have no doubts in my heart.

But still, the moment will come and you will be empowered by what you believe and what you do.

it's in your mind.

You believe in your worth, so you can walk on it.

So I just prop my body on the side of the car.

My legs were shaking and I went outside.

And I asked them, "What can I do for you?"

do you know what they said to me

They said, 'We know who you are.

we know where you're going

I go north here and there every day.

You train women, you teach them, and you give them the opportunity to have jobs.

you build their skills. what about us ”

(Laughter) (Applause) "So what about us?

what should i do? "

I looked at them and said, "I don't know."

(Laughter) They said, "Okay.

The only thing we can do, what we've known since we were born, is to pick up a gun and kill.

That's all we know. ”

And you know what that means.

Of course it's a trap for me.

So I walk out of there. They said, "Let's go, let's go."

So I got in the car, sat in the car, and told the driver, "Turn around and go back to the office."

Back then, we only supported girls.

All we had was the money to train the women and send them to school, and nothing else.

By the time I got to the office, of course the trainer was gone.

they fled home. No one stayed there.

My bodyguard was the only one there and my voice was completely gone.

Agitated, I sat down at the table and said, "What to do?"

How can I resolve this issue?

Because training was already taking place in the north.

Hundreds of women were there for training.

So I was sitting there and suddenly, at this moment, we were talking about momentum, at that moment, one of my wonderful donors called me about the report.

And she asked me, "Sakena?" and I answered her.

She said, "It's not you. What's wrong?"

I said "nothing". I covered it.

No matter what I tried, she didn't believe me and asked me again.

"Okay, tell me what's going on?"

I told her the whole story.

At that time she said, "Okay, now you will go and you will help them."

you will help them ”

And two days later, when I drove down the same road, you know, they weren't here, they were a little further away, and the same young men were standing there with rifles pointing to us to stop.

So we stopped the car.

i went outside I said, "Okay, let's go together."

And they said yes.

I said, "I have one condition, but accept whatever I say."

And they said, "Yes, they are."

So I took them to the mosque and said, in short, I would give them a teacher.

Today they are the best trainers.

They learned English, learned how to be teachers, learned computers, and are my guides.

I'll go with you wherever you don't know deep in the mountains. They're ahead, and we're going.

And they protect us.

And -- (applause) Thank you.

(Applause) This speaks to how education changes people.

Educating people changes them. Today we need to work towards gender equality.

We cannot just train women and forget about men. Because men are the ones who hurt women the most.

(Laughter) So we started training men. Because men need to know women's potential, how much potential men have, and how much women can do the same job as they do.

So we are training men continuously, and I believe really strongly.

I live in a beautiful country.

I would like to share this with you.

It was a beautiful country, a beautiful and peaceful country.

we were going everywhere.

The women were educated to be lawyers, engineers, teachers, etc., and we went from house to house.

We never locked the door.

But you know what happened to my country.

Today people cannot walk out the front door without security issues.

But we want the same Afghanistan as before.

And I would like to tell you another aspect.

Today, Afghan women work very hard.

they have a degree. They are training to become lawyers.

They are training to become doctors again.

They are training to be teachers and run businesses.

So it's so great to see people like that reach their full potential and all of this is yet to come.

I want to share this with you for love, compassion, trust and integrity.

If you have a few of these things you will be able to achieve.

We have a poet named Maurana Rumi.

He said that with compassion and love we can conquer the world.

Let me tell you, it is possible.

If Afghanistan can do it, I am 100 percent sure that anyone can do it anywhere in the world.

thanks so much.

(Applause.) Thank you. thank you.

(applause)

Imagine not being able to say, "I'm hungry," "I'm in pain," "Thank you," or "I love you."

A body that is trapped inside and does not respond to commands.

I am completely alone even though I have people around me.

I hope you will reach out, connect, comfort and participate.

For 13 long years, that was my reality.

Most of us don't give much thought to speaking and communicating.

I thought a lot.

I had a lot of time to think.

For the first twelve years of my life, I was a normal, happy, healthy boy.

Then everything changed.

I have a brain infection.

The doctors didn't know what it was, but they did the best they could.

But I was getting sicker and sicker.

Eventually, I lost my ability to control my movements, my ability to make eye contact, and finally my ability to speak.

When I was in the hospital, I just wanted to go home.

I said to my mother, "When are you coming home?"

Those were the last words I spoke in my own voice.

In the end, I failed all tests of mental awareness.

My parents told me I was as good as not there.

A vegetable with the intelligence of a 3-month-old baby.

They took me home and told me to try to make myself comfortable until I died.

My parents, actually my whole family, were obsessed with taking care of me the best they knew how.

their friends are gone.

One year became two years, two years became three years.

The old me seemed to disappear.

Lego blocks and electronic circuits that I loved as a boy have been put away.

I was moved from my bedroom to another more practical room.

I've become a ghost A faded memory of the boy people once knew and loved.

Meanwhile, my heart began to connect again.

Gradually I started to regain consciousness.

But no one noticed that I had come back to life.

I knew everything, like any normal person.

I could see and understand everything, but I couldn't find a way to tell anyone about it.

My personality was buried in a seemingly silent body, my vibrant mind hidden in a chrysalis.

The harsh reality hit me that I would spend the rest of my life trapped inside myself and completely alone.

I was obsessed with thinking only about the company.

I will never be saved

No one showed me kindness.

I never talk to my friends.

no one will love me

I had no dreams, no hopes, no pleasures.

Well, nothing fun.

I lived in fear and frankly waited for death to finally set me free. I expected to die alone in a nursing home.

I don't know if words can really express the fact that we don't understand each other.

Your personality seems to disappear into a thick fog, all your emotions and desires become constricted, repressed and quiet within you.

The worst thing for me was the feeling of complete helplessness.

I just existed.

It's a very dark place to find yourself. Because, in a way, you're gone.

Others were controlling every aspect of my life.

They decided when and what I would eat.

I was laid on my side or tied to a wheelchair.

I used to spend my days sitting in front of the TV watching reruns of Barney.

Bernie was so happy and cheerful and I definitely wasn't, which made it even worse, I think.

I could never change my life or people's perception of me.

I was a silent, invisible observer of how people behaved when they thought no one was watching.

Unfortunately, I was more than just an observer.

With no means of communication, I was the perfect victim. A defenseless object that seems to be devoid of the emotions that people use to express their darkest desires.

For over a decade, the people in my care physically, verbally, and sexually abused me.

Whatever they thought, I felt that way.

The first time something like that happened, I was shocked and in disbelief.

How could they do this to me?

i was confused.

What have I done to deserve this?

Part of me wanted to cry, another part wanted to fight.

Hurt, sadness, and anger surged through me.

I felt worthless.

I had no one to comfort me.

But none of my parents knew this was happening.

I lived in fear that the same thing would happen again and again.

I had no idea when.

All I knew was that I would never be the same.

I remember hearing Whitney Houston once sing, "No matter what they take from me, they can't take my dignity."

And I thought to myself, "Do you want to bet?"

Maybe my parents could have helped me.

But for years, the constant caring that had to get up every two hours to turn me around, combined with what was essentially the grief of losing my son, took a toll on my mom and dad.

There was another violent argument between my parents, and in a moment of despair and desperation, my mother told me that I would rather die.

I was shocked, but my mother's words filled me with great compassion and love for her, but I couldn't do anything about it.

There were many moments when I fell into the dark abyss and gave up.

I remember a particularly depressed moment.

My father left me alone in the car and rushed to the store to buy something.

A stranger passed by and looked at me and smiled.

I may never know why, but that simple act, that moment of human connection, changed my mind and made me want to keep going.

My existence was plagued with monotony, a reality that was often unbearable.

As I pondered to myself, I developed complex fantasies about ants crossing the floor.

I have taught myself to tell time by noting where the shadows are.

As I learned how shadows moved over the course of the day, I realized how long it would take me to pick them up and bring them home.

Seeing my father come through the door to pick me up was the best moment of the day.

My mind has become a tool that I can use to either close to withdraw from reality or expand into vast spaces that I can fill with my fantasies.

I was hoping that my reality would change and that someone would see me come to life.

But I was swept away like a sandcastle too close to the waves and instead had the person people expected of me.

To some, I was a Martin, a husk, a vegetable, worthy of harsh words, dismissal, and even abuse.

To others, I looked like a tragically brain-damaged boy grown into an adult.

Who they were kind and caring.

For better or worse, I was projecting versions of myself onto a blank canvas.

New people could see me in a different way.

An aromatherapist came to the care home about once a week.

Whether it was by intuition or by attention to detail that others hadn't noticed, I became convinced that she understood what I was saying.

She encouraged parents to be tested by an Augmented and Alternative Communication specialist.

And less than a year later, I started using computer programs to communicate.

It was exhilarating, but it was also frustrating at times.

I had so many words in my head that I couldn't wait to share them.

Sometimes I would say something to myself just because I could.

I had a ready audience within myself, and believed that if I expressed my thoughts and wishes, others would listen.

However, as I deepened my communication, I realized that it was really just the beginning of creating a new voice for myself.

I was thrown into a world that I had no idea how it was supposed to work.

I stopped going to care homes and managed to get my first job making copies.

As simple as it sounds, this was amazing.

My new world was really exciting, but often very overwhelming and terrifying.

I was like a boy, and I often felt liberated, but I struggled.

I also found that many people who have known me for many years feel they can't let go of Martin's thoughts in their heads.

People who had just met struggled to overlook the silent man in a wheelchair.

I have noticed that some people only listen to me if what I say matches their expectations.

Otherwise ignored and they did what they thought best.

I realized that true communication is more than just physically conveying a message.

It's about having your message heard and respected.

Still, things were going well.

My body gradually became stronger.

I have a job in computing that I love, and even got a dog, Kojak, that I've dreamed of for years.

But I longed to share my life with someone.

I remember staring out the window when my dad drove me home from work and thinking that I had so much love in me and no one to give it to me.

I met Joan when I was giving up on being single for the rest of my life.

Not only is she the best thing that ever happened to me, Joanne helped me question my misconceptions about myself.

Joanne said she liked me through my words.

But despite all that I've been through, I still can't shake the belief that no one truly transcends my disability and accepts me for who I am.

I also had a really hard time understanding that I am a man.

The first time someone called me a man, I stopped.

It made me want to look around and ask, "Who am I?"

Everything changed with the arrival of Joan.

We have a great connection and have learned how important it is to communicate openly and honestly.

I felt safe and confident that I could say what I was thinking.

I began to feel whole again and a man worthy of being loved.

I started rebuilding my destiny.

I also tried to talk to him at work.

I insisted on the need for independence to those around me.

Giving them a means of communication changed everything.

I used my words and my will power to challenge my preconceived notions about people around me and myself.

Communication is what makes us human and allows us to connect at the deepest level with those around us, allowing us to tell our own stories, express our wants, needs and desires, and listen to others by truly listening.

All of these are how the world knows who we are.

So who are we without it?

True communication fosters understanding and creates a more caring and compassionate world.

Once, I was perceived as an inanimate object, an ignorant apparition of a boy in a wheelchair.

Today I have grown even more.

Husband, son, friend, brother, business owner, first class honors graduate, avid amateur photographer.

What gave me all this is my communication skills.

We are told that actions speak louder than words.

But is it any wonder?

Our words are just as powerful, no matter how we say them.

Words are one of our most powerful tools, whether we speak them with our voice, type them with our eyes, or communicate them non-verbally to someone who speaks for us.

I came to you through a terrible darkness, coming out of the darkness by a compassionate soul and language itself.

The act of you listening to me today brings me further into the light.

we shine together here.

If there's one of the hardest obstacles to my way of communicating, it's that sometimes I want to shout, and other times I just want to whisper words of love and gratitude.

They all sound the same.

But if you can, imagine the following two words as warmly as possible. "thank you".

(applause)

All our lives, we have contributed to climate change.

Actions, choices, actions will lead to increased greenhouse gas emissions.

And I think that's a very powerful idea.

But when we think about the decisions we make about where we travel, how often and how we travel, the energy we use at home and at work, or simply the lifestyle we live and enjoy, we can feel guilty.

But we can turn that idea on its head and think that if we are already having such a severe but negative impact on the climate, we have an opportunity to influence the amount of future climate change that we will need to adapt to.

So we have a choice.

We can choose to start taking climate change seriously or significantly reduce or mitigate our greenhouse gas emissions. That way, we will have to adapt less to the effects of climate change in the future.

Or we can continue to really ignore the climate change issue.

But in doing so, we are choosing to adapt to more powerful climate impacts in the future.

That's not all.

As people living in countries with high per capita emissions, we are making that choice for others.

But the option we don't have is a future without climate change.

Over the past two decades, government negotiators and policymakers have come together to discuss climate change, with a focus on avoiding 2 degrees Celsius of warming above pre-industrial levels.

This is the temperature associated with dangerous effects across a range of indicators for humans and the environment.

So 2 degrees Celsius means dangerous climate change.

But dangerous climate change can be subjective.

So if you think about extreme weather that could happen anywhere in the world, and it happens in a part of the world with good infrastructure and well-insured people, the impact could be devastating.

It can cause upsets and can incur costs.

There may even be fatalities.

But if that very same weather event were to occur in some parts of the world where infrastructure is poor, people are not well insured and people do not have adequate support networks, the same climate change impacts could be devastating.

It can cause significant loss to the home, but it can also cause mass deaths.

Here's a graph on the left showing CO2 emissions from fossil fuels and industry, and the time from pre-industrial times to the present.

And the immediate surprise about this is that emissions are increasing exponentially.

Focusing on the shorter period since 1950, the establishment of the Intergovernmental Panel on Climate Change in 1988, the Rio Earth Summit in 1992, and a few years later, the Copenhagen Accord in 2009 set out to avoid a 2°C temperature rise based on equity in line with science.

And in 2012, the Rio +20 event was held.

And emissions have been increasing during all these conferences and many others.

And if we take a look at historical emissions trends in recent years, and combine that with our understanding of where the world economy is headed, we're much more on track with 4 degrees Celsius of global warming than with 2 degrees Celsius of global warming.

Now let's stop for a moment and think about this average global temperature of 4 degrees.

Most of our planet is actually made up of oceans.

Now, because the ocean has more thermal inertia than land, the average temperature on land is actually higher than on the ocean.

Second, we humans do not experience the average temperature of the Earth.

Especially if you live in Manchester like I do, you experience hot, cold and rainy days.

Now put yourself in the heart of the city.

Imagine Mumbai, Beijing, New York or London anywhere in the world.

It's the hottest day I've ever experienced.

The sun is shining and the surroundings are covered with concrete and glass.

Now imagine the same day. But the temperature on that heat wave day was 6, 8, maybe 10 to 12 degrees higher.

That's what we'll experience in a scenario where the average global temperature is 4 degrees.

And the problem with these extreme temperature extremes, but also with extreme events in terms of storms and other climate impacts, is that our infrastructure is not set up to deal with these kinds of events.

That is why our road and rail networks are designed to last for a long time and only withstand a certain amount of impact in different parts of the world.

And this will be a very difficult task.

Our power plants are expected to be cooled by water to a constant temperature to maintain efficiency and resilience.

And our buildings are designed to be comfortable within a certain temperature range.

And all this would be a big challenge under a 4th type scenario.

Our infrastructure was not designed to deal with this.

So when you think about the 4ths, there are some direct effects as well as some indirect effects.

For example, consider food security.

In some parts of the world, maize and wheat yields are projected to decline by up to 40%, and rice by up to 30%, under a 4°C scenario.

This would be absolutely catastrophic for global food security.

So, all in all, the kind of impacts expected in this 4°C scenario would be incompatible with organized global life.

So let's go back to the orbits and the 4th and 2nd degree graphs.

Is it still reasonable to focus on 2 degree paths?

Quite a few of my colleagues and other scientists say it's too late to avoid 2 degrees of warming.

But I just want to say that my own research on energy systems, food systems, aviation and shipping still gives me a slim chance of avoiding these dangerous two degrees of climate change.

But to figure out how to do that, you really need to get your hands on the numbers.

So if you look at this trajectory and these graphs, the yellow circle there highlights the immediate exit from the red 4th degree path to the 2nd degree green path.

It is due to cumulative emissions, or carbon balance.

This means that the lights and projectors that are on in this room right now will cause the CO2 emitted into the atmosphere as a result of their power consumption to persist for a very long time.

Some of them will be in our atmosphere for a century or longer.

It accumulates and greenhouse gases tend to accumulate.

And that tells us something about these trajectories.

First of all, it's the area under these curves that matters, not where we'll end up at any given date in the future.

That's important. Because it doesn't matter if in the last days of 2049, on the brink of solving the problem, we come up with some amazing technology to solve our energy problem.

This is because emissions accumulate over time.

So, if we continue this red 4 degrees Celsius scenario path, the longer we do, we need to make up for it later in the year to keep the same carbon budget and the same area under the curve. That means that trajectory, the red trajectory there, will be steeper.

This means that if we do not reduce our emissions in the short to medium term, we will need to make even more significant year-on-year reductions.

We also know that we need to decarbonize our energy system.

But if we don't start reducing emissions in the short to medium term, we'll have to cut even faster.

So this poses a huge challenge for us.

Another is to tell something about energy policy.

If you live in a part of the world where per capita emissions are already high, you will be headed towards reducing energy demand.

That's because the massive engineering infrastructure that needs to be deployed rapidly to decarbonize the supply side of the energy system simply won't be there in time, no matter how much the world wants it.

So it doesn't matter whether we choose nuclear power, carbon capture and storage, expand biofuel production, or aim for a larger deployment of wind and wave turbines.

It all takes time.

Therefore, we should focus not only on energy efficiency, but also on energy conservation, i.e. reducing energy usage, as it is the area under the curve that matters.

And doing that also means that as we continue to deploy supply-side technologies, if we can actually reduce energy consumption, we will have less work to do because less infrastructure will be needed on the supply side.

Another issue that we really need to address is that of welfare and equity.

There are many regions in the world that need to improve their living standards.

However, our energy system now relies on fossil fuels, and as our economy grows so will emissions.

And now, if we are all constrained to the same amount of carbon budget, it means that if some parts of the world need to emit more, other parts of the world will need to reduce their emissions.

It therefore poses a very significant challenge for rich countries.

Because, according to our research, if you're in a country with very high per capita emissions - North America, Europe and Australia - you need to start reducing emissions by around 10 percent a year immediately to avoid the 2 degree target.

Let's put that into context.

Economist Nicholas Stern said that annual reductions in emissions of more than 1% have so far only been associated with recessions or economic upheavals.

This therefore poses a major challenge to the issue of economic growth. This is because having a high-carbon infrastructure means that as the economy grows so will emissions.

So I would like to quote from a paper that Kevin Anderson and I wrote in 2011. It said economic growth needed to be traded, at least temporarily, for periods of planned austerity in rich countries to avoid a dangerous two-degree climate change regime.

This is a message that is really hard to accept. Because what this message suggests is that we really need to do things differently.

This is not just a gradual change.

This is about doing things differently, changing entire systems, and sometimes doing less.

And this applies to all of us, regardless of what influence we have.

So it could be from writing a letter to your local politician, to talking to your boss at work, or being your boss at work, talking to friends and family, or very simply, making a lifestyle change.

Because we really need to make big changes.

So far, we have chosen a 4 degree scenario.

If you really want to avoid a 2nd degree scenario, now is the time to act.

thank you.

(Applause) Bruno Giussani: Alice, basically what you're saying is that unless rich countries start cutting their emissions by 10 percent a year now, not in 2020 or 2025, we're going straight to a 4+ degree scenario.

What are your thoughts on a 70 percent reduction for 2070?

Alice Bowes-Larkin: Well, not twice as avoidable.

If there is modeling research to consider what we need to do, one thing that often happens is that we tend to greatly overestimate how quickly the rest of the world can start reducing emissions.

So they make some sort of heroic assumption about it.

Because the more you do it, the more it's cumulative emissions and what really matters is the short term.

So it makes a big difference.

A few more years of growth for a large country like China, for example, would make a big difference when decarbonization is needed.

I don't think I can say when that will be because it all depends on what we have to do in the short term.

But I think we have vast reach, and it would be a shame not to pull levers that could reduce our energy demands.

BG: Alice, thank you for coming to TED and sharing this data.

ABL: Thank you.

(applause)

Well, this is a great honor. And it's great to be in an organization that's really making a difference in the world.

And thank you very much for giving me the opportunity to speak with you today.

And looking back on my life, I'm pretty surprised because the last thing I wanted to do was write or get involved in any way with religion.

After leaving the monastery, frankly, I quit my religion.

I thought that was it.

And for thirteen years I avoided it. I wanted to be an English literature professor.

And I never really wanted to be a writer.

But then I had one career catastrophe after another until I finally found myself in the world of television. (Laughter.) When I mentioned it to Bill Moyers, he said, "Oh, I'm open to anyone." (Laughter.) And I was doing some pretty controversial religious shows.

This was very well received in Britain, where religion is very unpopular.

And for once, once in my life, I was finally able to hit the mainstream.

But I was sent to Jerusalem to make a film about early Christianity.

And there, for the first time, I encountered other religious traditions: Judaism and Islam, sister religions of Christianity.

And it turned out that I knew absolutely nothing about these faiths, but about Islam, because despite my own very religious background, I only saw Judaism as a sort of prelude to Christianity.

But in that city, that tormented city, you see the three faiths unnervingly surging, and at the same time you realize the deep connection between them.

And by learning the traditions of other religions, I was able to regain my sense of what religions are like and actually see my faith in a different light.

And in the course of my research, I discovered some surprising things that I hadn't thought of before. Quite frankly, just when I thought I knew all about religion, I found all this really unbelievable.

These doctrines seemed unproven and abstract.

And to my astonishment, when I began to seriously study other traditions, I began to realize that the faiths we are making a fuss about today were only a very recent religious frenzy that surfaced only in the West around the seventeenth century.

The word "faith" itself originally meant to love, cherish, cherish.

In the seventeenth century, the focus narrowed down to what meant intellectual agreement with a set of propositions and beliefs, for the reasons I am exploring in the book I am writing.

"I believe" does not mean "I accept a particular belief clause."

It meant "I commit myself. I involve myself."

In fact, some world traditions give little consideration to religious orthodoxy.

Religious opinion, or religious orthodoxy, is dismissed in the Qur'an as "zannah," i.e. selfish speculation about things that no one can be sure of, which leads people to quarrelsome and foolish sectarianism. (Laughter.) So if religion isn't about believing in something, what is it?

What I've found is that, in general, it's about doing something that's not religious.

Instead of deciding whether to believe in God or not, let's do something first.

If you act diligently, you will come to understand the truth of religion.

And religious doctrine is a call to action. Only by doing it can you understand it.

Now pride in this practice is given to mercy.

And it is an astonishing fact that, uniformly in all the world's major faiths, compassion, the ability to feel others in the ways we have been thinking about tonight, not only tests true religiousness, but also leads us to the existence of what Jews, Christians, and Muslims call "God" or "God."

Buddha says it is compassion and it will lead you to Nirvana.

why? Because in compassion, when we feel with others, we pull ourselves out of the center of the world and put another person there. And when you get rid of your ego, you are ready to see God.

And in particular, every major tradition in the world emphasizes what has come to be known as the Golden Rule and places it at the core of its tradition.

First advocated by Confucius in the 5th century BC, "Do not do to others what you do not want them to do to you."

It is the central thread that runs through his entire teaching, he said, and should be practiced by his disciples all day, every day.

And that - the Golden Rule will bring them to the transcendental value he called 'Jin', the human mind, itself a transcendental experience.

And this is also very important for monotheism.

There is a famous story about Hillel, a great rabbi who was a contemporary of Jesus.

A pagan came to him and offered to convert to Judaism if a rabbi could stand on one leg and recite all the teachings of Judaism.

Hillel stood on one leg and said, "What is detestable to you, do not do to your neighbor. That is the law. The rest is commentary."

Go and study.” (Laughter) And what he meant was, “Go and study.”

He said, "In exegesis it must be made clear that every verse of the Torah is a commentary, a commentary on the Golden Rule."

The great Rabbi Meir said that any interpretation of Scripture that leads to hatred or contempt or contempt for others - any people - is illegal.

St. Augustine pointed out exactly the same thing.

The Bible "only teaches about charity," he said.

And this struggle to find compassion in these rather acrimonious sentences is a good rehearsal for doing the same in everyday life. (Applause.) But look at our world now. And we live in a world where religion has taken over. A place where terrorists quote Quranic verses to justify their atrocities.

There, instead of accepting the words of Jesus, they said, "Love your enemies."

Do not judge others,” but we see Christians endlessly judging others, endlessly using the Bible as a means of arguing with others, and demeaning others. Religion has always been used to oppress others because of human ego, human greed.

We have a talent as a species to ruin great things.

Tradition, therefore, also argues that compassion cannot and must not be confined to one's own group: one's nation, one's co-religionist, one's compatriots, and this, I think, is an important point. You must have consideration for everyone, as one of the Chinese sages called "Jian Ai". love your enemies Be respectful to strangers.

The Quran says, "We have divided you into tribes and nations so that you may know each other."

And again, this universal activity is being curbed by the violent use of religion for nefarious gain, the abuse of religion.

Now, when I ask what I do for work, I am overwhelmed by the number of taxi drivers who tell me that religion is the cause of all the major world wars in history. error.

The cause of our current predicament is political.

But don't get me wrong, religion is a kind of rift, and when conflict takes root in a community, religion can get caught up in it and become part of the problem. Our modern age is very violent.

Between 1914 and 1945, 70 million people died in Europe alone as a result of armed conflict.

And so many of our organizations, even football that used to be a fun pastime, now cause riots and even cause people to die.

And it should come as no surprise that religion has also been influenced by this violent spirit.

I think there are a lot of religious illiterates around.

People now seem to equate religious belief with believing in things.

We often refer to religious people as believers, as if that was their main activity. And all too often, secondary goals take precedence over compassion and the golden rule.

Because the golden rule is hard. Sometimes when I talk to my congregation about compassion, I sometimes see a rebellious look on their faces. Because many religious people prefer righteousness to compassion. (Laughter) Well, that's not all.

Since the September 11th attacks, my work on Islam has suddenly pushed me into the public eye, but in ways I never could have imagined, I could go around the world and feel the yearning for change wherever I went.

I had just returned from Pakistan, where literally thousands of people had come to my lectures. Because, first of all, they longed to hear the voice of a friendly Westerner.

And especially young people were coming. And young people asked me, "What can we do? What can we do to change the situation?"

And my hosts in Pakistan said, "Hey, don't be so polite to us.

Please let me know where I am going wrong. Let's discuss together where religion is failing. ”

Because our current situation is so grave at the moment that any ideology that does not promote global understanding and a sense of global mutual appreciation seems to have failed the test of the times.

And a religion with a wide following… As the report showed, people here in the United States may be becoming religious in other ways, but they still want to be religious. Western Europe is the only country that maintains secularism, which is now starting to look rather lovably antiquated.

But people want to be religious, and religion should be a force promoting harmony in the world, and thanks to the Golden Rule, it can and should.

"Don't do to others what you don't want them to do to you": This spirit should now be applied globally.

We should not treat other countries as we would not like to be treated ourselves.

And these are religious issues, spiritual issues, whatever our dire beliefs.

This is a highly moral issue that all of us are and should be concerned with.

And as I say, there is a desire in the world for change.

I think we'll see that in this election campaign here in the United States. It is the longing for change.

And since September 11th, people from churches and mosques across the continent have gathered locally to build networks of understanding.

To the mosque, to the synagogue, "We must start talking to each other."

I think it's time for us to move beyond the idea of ​​tolerance and move toward respect for others.

Well, there is one story I would like to touch on.

It comes from the "Iliad". But it tells us what this spirituality should be like.

You know the story of the 10-year war "Iliad" between Greece and Troy.

In one incident, the famous Greek warrior Achilles withdraws his army from the war, and the whole war takes a hit. And in the ensuing chaos, his beloved friend Patroclus is killed, killed in single combat by Hector, one of the Trojan princes. Achilles goes mad with grief, anger, and revenge, and mutilates his body. He kills Hector, mutilates his body, and subsequently refuses to return the body to his family for burial. This means, in the Greek mentality, that Hector's soul will forever wander and be lost.

And one night, an old man named Priam, king of Troy, came incognito to the Greek camp and went to Achilles' tent in search of his son's body.

And everyone is surprised when the old man takes off his head covering and reveals himself.

And when Achilles sees him, he remembers his father. and he starts crying.

And Priam saw the man who had killed many of his sons, and he too began to weep. And the sound of their sobs echoed through the house.

The Greeks believed that crying together created a bond between people.

And Achilles took Hector's body and very gently handed it to his father, and they looked at each other and recognized each other as sacred.

It is a spirit found in all religions.

It means overcoming the fear you feel when you are threatened by an enemy and starting to appreciate them.

It is very important that the word "holy" applied to God in Hebrew is "kadsh", separate and other.

And perhaps it is the very otherness of the enemy that gives us hints about the utterly mysterious transcendence of God.

And now this is my wish. We invite you to help create, launch and disseminate the Charter of Mercy, created by a group of inspired thinkers based on the basic principles of the Golden Rule from the three Abrahamic traditions of Judaism, Christianity and Islam.

We need to unite in some way among all the people I meet on my travels and create a movement among those you will probably meet who want to regain the faith that, as I say, feels hijacked.

We need to empower and guide people to remember the spirit of compassion. This charter is not a large document.

I want to see it To give guidelines on how to interpret the Bible that has been abused. Remember what Rabbi and Augustine said about how the Bible should be governed by the principle of charity.

Let's return the story. And there is also the idea of ​​Jews, Christians and Muslims (those traditions now often at odds) working together to produce a document that we hope will be signed by at least 1,000 major religious leaders from all traditions of the world.

And you are the people. I'm just a lonely scholar.

Despite the idea that I love good times, I was rather surprised to see it come down to me -- in fact, I spend a lot of time studying alone, which I'm not very good at -- and you guys with media savvy explain to me how this can get to everyone on the planet. I have had some preliminary talks and Archbishop Desmond Tutu, for example, is happy to be on the list, as is Imam Faisal Rauch, Imam of New York City.

I will also work with the United Nations Alliance of Civilizations.

I was in a United Nations initiative called the Alliance of Civilizations. The initiative was commissioned by Kofi Annan to give member states practical guidelines on how to diagnose the causes of extremism and avoid further escalation of extremism.

And the Alliance told me they are very happy to work together.

The point is that this is -- I know some people are worried because they think it's a slow and cumbersome organisation -- but what the UN can do is give us some degree of neutrality. Then this will not be seen as a Western or Christian effort, but something that comes from the United Nations, from the world, so to speak. Who will help me with this kind of bureaucracy.

So I urge you to join me in formulating, enacting, enacting, and disseminating this Charter, so that this Charter becomes what it is. We see this charter in every university, in every church, in every mosque, in every synagogue around the world, so that people can and should turn to their traditions, take them back, and make religion a source of peace in the world. thank you very much. (applause)

In 1901, a woman named Auguste was placed in a medical asylum in Frankfurt.

Auguste was paranoid and unable to remember even the most basic details of his life.

Her doctor's name was Alois.

Alois did not know how to help Auguste, but sadly watched over her until his death in 1906.

After her death, Alois performed an autopsy and found strange plaques and tangles in Auguste's brain - unlike anything he had ever seen before.

There's something even more amazing.

If Auguste were alive today, we could offer her the same help we could have given Alois 114 years ago.

Alois was Dr. Alois Alzheimer.

Auguste Deter was the first patient diagnosed with what is now called Alzheimer's disease.

Medicine has come a long way since 1901.

We have discovered antibiotics and vaccines that protect against infections, many treatments for cancer, antiretrovirals for HIV, statins for heart disease, and more.

However, there has been essentially no progress in treating Alzheimer's disease.

I am part of a team of scientists who have been working to find a cure for Alzheimer's disease for over a decade.

So I think about this all the time.

Alzheimer's disease currently affects 40 million people worldwide.

But by 2050, 150 million people will be affected. By the way, many of you are among them.

If you want to live past the age of 85, your chances of developing Alzheimer's disease are almost 1 in 2.

In other words, you are likely to spend your golden years either suffering from Alzheimer's or helping to care for a friend or loved one with Alzheimer's.

Alzheimer's disease already costs $200 billion annually in the United States alone.

Every $5 in Medicare is spent on Alzheimer's.

It is currently the most expensive disease, with costs projected to increase five-fold by 2050 as baby boomers age.

Simply put, it may surprise you that Alzheimer's disease is one of the greatest medical and social challenges of our generation.

But we've done very little to address it.

Currently, Alzheimer's disease is the only one of the world's top 10 causes of death that cannot be prevented, treated, or slowed.

The science of Alzheimer's disease is less understood than other diseases due to the lack of time and money devoted to researching Alzheimer's disease.

Even though Alzheimer's is more expensive and causes as many deaths as cancer each year, the U.S. government spends 10 times more to research Alzheimer's disease each year.

The lack of resources stems from a more fundamental cause: lack of awareness.

Because this is something most people don't know, but everyone should know. Alzheimer's is a disease and we can treat it.

For most of the past 114 years, everyone, including scientists, has mistakenly confused Alzheimer's disease with aging.

We used to think that aging was normal and an inevitable part of aging.

But to know the actual physical damage caused by Alzheimer's disease, it is enough to look at pictures of healthy aged brains compared to those of Alzheimer's patients.

Brain damage from Alzheimer's disease not only causes severe memory and mental capacity loss, but also significantly reduces life expectancy and is always fatal.

Recall that Dr. Alzheimer discovered strange plaques and tangles in Auguste's brain a century ago.

For nearly a century we didn't know much about these.

Today we know they are made of protein molecules.

A protein molecule can be imagined as a sheet of paper that is usually folded into an elaborate origami.

There is a sticky part on the paper.

And when folded correctly, these sticky parts are on the inside.

This causes protein molecules to stick to each other, forming clumps and eventually large plaques and tangles.

That's what you see in the brains of people with Alzheimer's disease.

We have spent the last ten years at Cambridge University trying to understand how this malfunction works.

There are many steps and identifying which steps to block is as complicated as defuse a bomb.

Cutting one wire may not do anything.

Disconnecting others can lead to bombs being explored.

We need to find the right steps to block and create potions that do that.

Until recently, we've mostly just cut the wire and hoped for the best.

But now we have a diverse group of people: doctors, biologists, geneticists, chemists, physicists, engineers, mathematicians.

Together, we have successfully identified a key step in the process and are now testing a new class of drugs that specifically block this step to stop the disease.

No one outside our lab has seen this yet.

Let's take a look at some videos of what happened when we tested these new drugs on worms.

So you can see that these are healthy worms that are moving around normally.

These worms, on the other hand, have protein molecules stuck together in their bodies, just like humans with Alzheimer's disease.

And it turns out that they are clearly sick.

However, when these worms are given new drugs at an early stage, they are found to be healthy and live a normal lifespan.

While this is only the first positive result, studies like this show that Alzheimer's is a disease we can understand and treat.

After 114 years of waiting, there is finally real hope for what we can achieve in the next 10 or 20 years.

But to nurture that hope and ultimately beat Alzheimer's, you need help.

This isn't about scientists like me, it's about you.

We need to raise awareness that Alzheimer's disease is a disease that can be overcome with effort.

For other diseases, patients and their families have spearheaded further research, putting pressure on governments, the pharmaceutical industry, scientists and regulators.

It was essential to the progress of HIV treatment in the late 1980s.

Today we see the same drive to beat cancer.

However, Alzheimer's patients are often unable to speak up for themselves.

And their families, the hidden victims, are often too exhausted to go out and advocate for change while caring for loved ones day and night.

I mean, it's really up to you.

Alzheimer's disease is mostly not a genetic disease.

Anyone with a brain is in danger.

Today, there are 40 million patients like Auguste who are unable to make the changes they need.

Help them speak up and demand treatment.

thank you.

(applause)

Raise your hand if you've ever been asked, "What do you want to be when you grow up?"

Now, if I had to guess, how old were you when you were first asked this question?

All you have to do is hold your finger over it.

three. Five. three. Five. Five. OK.

Now, raise your hand to the question, "What do you want to be when you grow up?"

Has it ever made you uneasy?

(Laughter) No worries at all.

I'm a person who can never answer the question, "What do you want to be when you grow up?"

The problem wasn't that I wasn't interested, it was that I had too many interests.

In high school, I loved English, math and art, building websites and playing guitar in a punk band called Frustrated Telephone Operator.

Maybe you've heard of us.

(Laughter) This continued after high school, and at some point I started noticing a pattern in myself where I was interested in a field, jumped into it, fell in love with it, and got pretty good at whatever it was, but then I started to get bored.

And I've already put a lot of time and energy, and sometimes money, into this area, so I usually just stick with it anyway.

But in the end, this feeling of boredom, that feeling of "Okay, this isn't going to work anymore" will become too much.

And I had to let it go.

But then you get interested in something else, you get totally unrelated, you get into it, you get sucked into it, and you're like, 'Yes, I've found what I want to do,' and then I start getting bored again.

And in the end I let it go.

But then you discover and dive into something completely different and new.

This pattern caused me great anxiety for two reasons.

The first was that I didn't know how to turn this into a career.

I thought I would eventually have to pick one, deny all my other passions, and just let myself be bored.

Another reason it caused me so much anxiety was a little more personal.

I worried that there was something wrong with this, that there was something wrong with me that I couldn't continue.

I worried that I was afraid of commitment, that I was falling apart, that I was self-sabotaging because I was afraid of my own success.

If you can relate to my story and this sentiment, ask yourself the questions you would have asked yourself at the time.

Ask yourself where you learned what it means to be wrong or unusual in doing so many things.

I'll tell you where you learned it. You learned it from culture.

The first question is, "What do you want to be when you grow up?"

when we were about 5 years old.

And the truth is, when you're that age, nobody really cares what you say.

(Laughter) This is seen as a harmless question that can be posed to small children to elicit cute answers such as "I want to be an astronaut," "I want to be a ballerina," or "I want to be a pirate."

Insert your Halloween costume here.

(Laughter) But this question gets asked over and over again in different ways as we get older. For example, a high school student may be asked which major to choose in college.

And one day, "What do you want to be when you grow up?"

It's changed from the cute exercise it once was to something that keeps you awake at night.

why?

This question encourages children to dream of what they can become, but it does not encourage them to dream of everything they can become.

In fact, it's quite the opposite, because when someone asks you what you want to be, you can't answer with 20 different things. However, a well-meaning adult will probably laugh and say, "Oh, how cute, but you can't be a violin maker or a psychologist. You can't be a violin maker or a psychologist."

you have to choose. ”

This is Dr. Bob Childs -- (Laughter) He's a luthier and a psychotherapist.

This is Amy Ng, magazine editor turned illustrator, entrepreneur, teacher, and creative director.

But most children don't know these people.

All they hear is that they must choose.

But that's not all.

The concept of a narrow and focused life is highly glorified in our culture.

It's the idea of ​​destiny, or the only true mission, that each of us has one great thing to do while we're living on this planet, and that we need to figure out what it is and dedicate our lives to it.

But what if you weren't wired like this?

What if you have a lot of interests and things you want to do?

Well, there is no room for someone like you in this framework.

And you may feel lonely.

You may feel aimless.

And you may feel that something is wrong with you.

you have no problem.

You are a multipotentialite.

(Laughter) (Applause) A multipotentialite is someone who has many interests and creative pursuits.

It's a bite.

It might be helpful to break it down into three parts: Multi, Potential, and Item.

You can also use other terms that imply the same idea (polymath, renaissance man, etc.).

In fact, during the Renaissance, it was considered ideal to be multidisciplinary.

Barbara Sher calls us "scanners".

Use any term you like or create your own.

As a community, it is kind of fitting that we cannot agree on a single identity.

(Laughter) It's easy to see our versatility as a limitation or anguish that needs to be overcome.

But what I've learned from talking to people and writing about these ideas on my website is that there is great strength in doing it this way.

Here are 3 multipotentialite superpowers.

The first is the synthesis of ideas.

That is, combine two or more fields to create a new one at the intersection.

Sha Hwang and Rachel Binx founded Meshu with their shared interests in cartography, data visualization, travel, mathematics and design.

Meshu is a company that creates custom geo-inspired jewelry.

It was not because of this, but because of their eclectic mix of skills and experience that Sha and Rachel came up with this unique idea.

Innovation happens at the intersection.

From there new ideas are born.

And multipotentialites of all backgrounds have access to many of these intersections.

The second superpower of multipotentialites is fast learning.

When multipotentialites are interested in something, we are enthusiastic about it.

We observe everything we can get our hands on.

Also, we've been beginners many times in the past, so we're used to being newbies. This means that you are less afraid to try new things or step out of your comfort zone.

Moreover, many skills are applicable across disciplines and we can leverage everything we learn in every new area we pursue, so we rarely start from scratch.

Nora Dunn is a full-time traveler and freelance writer.

As a children's concert pianist, she has honed an amazing ability to develop muscle memory.

Now she is the fastest typist she knows.

(Laughter) Nora was a financial planner before she became a writer.

She had to learn the finer details of sales when she started, but now this skill helps her write persuasive pitches to editors.

Pursuing what attracts you is rarely a waste of time, even if it means quitting.

You may be able to apply that knowledge to completely different areas, in ways you never expected.

The third superpower of the multipotentialites is adaptability. That is, the ability to transform into whatever is needed in a given situation.

Abe Cajudo is part video director, part web designer, part Kickstarter consultant, part teacher, and part James Bond.

(Laughs) He does a good job and is worth it.

He is even more valuable because he can take on different roles depending on the client's needs.

Fast Company magazine ranks adaptability as the most important skill to develop to thrive in the 21st century.

The economic world is changing so rapidly and unpredictably that it is those individuals and organizations that can pivot to meet the needs of the market that truly grow.

Idea Synthesis, Rapid Learning, Adaptability: Three skills that multipotentialites are very adept at, and three that they may lose if pressured to narrow their focus.

As a society, we have a vested interest in encouraging multipotentialites to be themselves.

There are many complex and multidimensional problems in the world today that require creative and out-of-the-box thinking to tackle them.

Now let's say you're an expert at heart.

You came out of the womb wanting to be a pediatric neurosurgeon.

please do not worry. There is nothing wrong with you either.

(Laughter) In fact, some of the best teams are made up of specialist and multipotentialite pairs.

Specialists can dig deeper into ideas and implement them, while multipotentialites bring a wide range of knowledge to projects.

It's a great partnership.

But we all have to design our lives and careers to fit our wiring.

And sadly, multipotentialites are mostly encouraged to simply resemble their professional peers.

With that said, I hope if there's one thing you can take away from this story, it's this. It's about embracing your inner wiring, whatever it is.

If you are a specialist at heart, by all means become one.

You will do your best work there.

But to all of you multipotentialites in this room, including those of you who may have realized in the last 12 minutes that you are one - (laughter), I say. Embrace your different passions.

Follow your curiosity and explore the rabbit hole.

Explore the intersection.

Embracing our inner wiring leads to a happier, more authentic life.

And perhaps more importantly, multipotentialites, the world needs us.

thank you.

(applause)

As adults, will we be able to grow new neurons?

There is still some confusion about this question as this is a fairly new area of ​​research.

For example, I was talking to one of my colleagues, Robert, an oncologist, and he said, "Sandrine, this is incomprehensible.

Some of my patients who were told they were cured of cancer still develop symptoms of depression. ”

And I replied to him, "Well, from my point of view, it makes sense.

Giving a patient drugs that stop cancer cells from growing also stops new neurons from forming in the brain. ”

Then Robert looked at me like I was mad and said, "But Sandrine, this is an adult patient. Adults don't grow new nerve cells."

And to his surprise, I said, "Yes, it is."

This is a phenomenon called neurogenesis.

[Neurogenesis] Currently, Robert is not a neuroscientist. When he was in medical school, he wasn't taught what we know now: that the adult brain can generate new nerve cells.

So Robert wanted to come to my lab to understand this subject a little better because, as you know, he's an excellent doctor.

And I took him on a tour to one of the most exciting parts of the brain when it comes to neurogenesis, the hippocampus.

This is the gray structure in the center of the brain.

And what we already knew for a long time is that this is important for learning, memory, mood and emotions.

However, we recently learned that this is one of the unique structures in the adult brain where new neurons are generated.

And if you slice the hippocampus and zoom in, what you actually see blue here are neonatal neurons in the adult mouse brain.

As for the human brain, my colleague at the Karolinska Institutet, Jonas Friesen, estimates that the hippocampus generates 700 new neurons per day.

You might think this is nothing compared to the billions of neurons we have.

But by the time we're 50, we'll all be replacing neurons born in that structure with those born in adults.

So why are these new neurons important and what are their functions?

First, we know they are important for learning and memory.

And we have shown in the lab that blocking the adult brain's ability to generate new neurons in the hippocampus blocks certain memory abilities.

And this is especially new and applies to spatial awareness, such as how we navigate within cities.

We are still learning a lot and neurons are important not only for memory capacity but also for memory quality.

And they help add time to our memory and also help us distinguish between very similar memories. For example, how do you find the bikes parked at the train station every day, but in the same place but in slightly different positions?

And even more interesting to my colleague Robert is the research we've been doing on neurogenesis and depression.

Thus, we found low levels of neurogenesis in animal models of depression.

And administration of antidepressants increases the production of these neonatal neurons, attenuating symptoms of depression, establishing a clear link between neurogenesis and depression.

However, simply inhibiting neurogenesis also inhibits the effects of antidepressants.

So by that time Robert understood that the cancer drugs had stopped the generation of neonatal neurons, so it was very likely that the patient would still be suffering from depression even after being cured of the cancer.

And it takes time to generate new neurons that reach normal function.

Taken together, therefore, we now have sufficient evidence that neurogenesis is the target of choice if we want to improve memory formation and mood, or prevent the decline associated with aging and stress.

So the next question is, can we control neurogenesis?

The answer is yes.

And now I'm going to do a little quiz.

Give me a range of behaviors and activities and tell me if you think they increase or decrease neurogenesis.

Are you ready?

yes, let's go

But what about learning?

increasing?

yes.

Learning increases the production of these new neurons.

What about stress?

Yes, stress reduces the production of new neurons in the hippocampus.

What about sleep deprivation?

Indeed, neurogenesis is reduced.

how about sex?

oh wow!

(laughter) Yes, that's right. Increased generation of new neurons.

However, balance is everything here.

We don't want to end up with too much sex and too little sleep (laughs).

(Laughter) What happens when you get older?

Thus, neurogenesis rates decline with age, but still continue to occur.

And finally, what about running?

You will have to decide for yourself.

This is one of the first studies conducted by one of my mentors, Rusty Gage of the Salk Institute, to show that the environment can influence the generation of new neurons.

And here is a portion of the hippocampus of a mouse without a running wheel in a cage.

And those little black dots you see are actually newborn neurons.

And now you can see part of the mouse's hippocampus with the running wheel inside the cage.

You can see that the number of black dots representing new neurons has increased significantly.

So activity affects neurogenesis, but it's not the only one.

What you eat affects the generation of new neurons in the hippocampus.

So here are some examples of nutritional diets that have been proven to work.

A few things to point out: restricting calories by 20-30% increases neurogenesis.

Intermittent fasting (allowing time between meals) increases neurogenesis.

Consuming flavonoids found in dark chocolate and blueberries promotes neurogenesis.

Omega-3 fatty acids found in fatty fish like salmon increase the production of these new neurons.

Conversely, a diet rich in high saturated fats adversely affects neurogenesis.

Ethanol, or alcohol consumption, reduces neurogenesis.

However, all is not lost. Resveratrol, found in red wine, has been shown to promote the survival of these new neurons.

So the next time you're at a dinner party, you might be tempted to reach for this supposedly "neurogenesis-neutral" drink.

(Laughter) And finally, let me point out the last one – the quirky one.

Therefore, the Japanese group was interested in the texture of food and showed that soft diets, as opposed to foods that require chewing (chewing) or crunchy foods, actually inhibit neurogenesis.

Therefore, all this data that we need to look at at the cellular level has been generated using animal models.

However, this diet was also given to human participants and was found to modulate memory and mood in the same direction that it modulates neurogenesis. For example, calorie restriction improves memory, while a high-fat diet exacerbates symptoms of depression, whereas omega-3 fatty acids increase neurogenesis and may also help reduce symptoms of depression.

Therefore, it is likely that the effects of diet on mental health, memory and mood are actually mediated by the generation of new neurons in the hippocampus.

And it's not just what you eat, it's the texture of the food, when you eat it, and how much you eat.

On our part, as neuroscientists interested in neurogenesis, we need a deeper understanding of the functions of these new neurons and how their survival and generation can be controlled.

We also need to find ways to protect neurogenesis in Robert's patients.

And for your part, it leaves the responsibility of your neurogenesis on you.

thank you.

(Applause) Margaret Heffernan: Great work, Sandrine.

Well, as I said you changed my life, I eat a lot of blueberries now.

Sandrine Thurét: Very good.

MH: I'm very interested in running.

do i have to run?

Or is it really just cardio and oxygen to the brain?

Can I do some vigorous exercise?

ST: At this point, I can't say exactly if it's running per se, but I think anything that actually increases production, moving blood flow to the brain, should be beneficial.

MH: So you don't need to have a running wheel in your office?

ST: No, it's not!

MH: Oh, what a relief! It is amazing.

Thank you very much, Sandrine Thule.

ST: Thank you Margaret.

(applause)

"Here rests Arthur, the former king, and the future king," says the inscription on Arthur's tombstone in Thomas Mallory's The Death of King Arthur.

Mallory, writing in the 15th century, could not have predicted how prophetic the inscription would be.

King Arthur has appeared in our collective imagination time and time again, along with the Knights of Guinevere, the Round Table, Camelot, and of course Excalibur.

But where did these stories come from, and is there any truth to them?

Although the King Arthur we know is a late medieval creation, his legend actually has its roots in an even older Celtic poem: the Saxon invasion of Britain.

After the Romans left England in 410 AD, the Saxons quickly took advantage of the vulnerability of the abandoned territories to invade from what is now Germany and Denmark.

The inhabitants of England fought fiercely against the invaders during centuries of turmoil.

Reconstructing an accurate history is difficult as few written records remain from this period.

However, surviving poems from the period provide some clues.

One of the poems, "The Gododdin", contains the first mention of Arthur, although Arthur himself does not actually appear in it.

According to it, another warrior named Gwaldur was skilled at killing enemies, but not King Arthur.

I won't say more, but whoever this Arthur was, he must have been the golden rule of the warrior.

It's unfortunately not very clear if he was ruling over anyone or even alive in the first place.

Despite this uncertainty, hundreds of years later, references to Arthur have caught the attention of aspiring historians.

In 1130, Geoffrey of Monmouth was a minor priest with grand ambitions.

Using Celtic and Latin material, over the years he produced a lengthy chronicle titled The History of the Kings of Britain.

The centerpiece of this book was King Arthur.

History is a generous term for describing Jeffrey.

Six hundred years after the Saxon invasion, he wrote a combination of mythological and poetic fragments to compensate for the near-total lack of official records.

Some of his sources included references to Arthur, others included realistic descriptions of battles and locations.

However, many of them featured mythical heroes who fought long battles with the help of enchanted swords and magic.

Jeffrey blended them all. Geoffrey's Arthur reigned from Carleon and wielded Caliburnus, the Latin translation of Kaledvrch, as a magic sword called Kaledvrch and a Roman fortress called Carleon appeared in his original work.

Geoffrey added a wise counselor named Merlin, modeled after the Celtic bard Mildin, to Arthur's story.

Had Arthur lived, he would probably have become a military leader, but a castle-bound king was a better fit for Geoffrey's majestic career.

Geoffrey's Chronicle got the attention he wanted and was soon translated from Latin into French by the poet Weiss around 1155 AD.

To Geoffrey's swords, castles, and wizards, Waithe added another feature of the Arthurian legend: the Round Table.

He writes that Arthur had the table erected so that all the guests of the court were evenly spaced, so that no one could boast that he had the highest position at the table.

After reading Waithe's translation, another French poet, Chrétien de Troyes, wrote a series of romances that catapulted Arthur's story to fame.

He introduced tales of individual knights like Lancelot and Gawain and mixed an element of romance into the adventure.

He envisioned a love triangle between Arthur, Lancelot, and Guinevere.

In addition to the interpersonal conspiracy, he also introduced the Holy Grail.

Chretian probably based his Grail's powers on magical objects from Celtic mythology.

He lived in the midst of the Crusades, and some cast the Grail as a powerful relic of the crucifixion, forcing the attention of the time to the Grail.

Many adaptations have been made from Chrétien's work in French and other languages.

In the course of these retellings, Carleon became Camelot and Caliburnas was renamed Excalibur.

In the 15th century, Sir Thomas Mallory compiled these stories into The Death of Darthur, which is the basis for many modern accounts of King Arthur.

A thousand years have passed since Arthur first appeared in Celtic poetry, and his story has been transformed many times to reflect the concerns of the chroniclers and their audiences.

And we are still rewriting and adapting that legend.

Whether or not the man has ever lived, loved, ruled, and ventured, there is no denying that the character has achieved immortality.

The universe began life in the Big Bang about 14 billion years ago and has been expanding ever since.

But what does it extend to?

That's a complicated question.

Here's why. Einstein's general theory of relativity equations describe space and time as a kind of interconnected structure of the universe.

This means that what we perceive as space and time exists only as part of the universe and not beyond it.

Now, as everyday objects expand, they move into more space.

But what does extending itself mean if there is no such thing as space to extend?

In 1929, Edwin Hubble's astronomical observations provided the definitive answer.

When he surveyed the night sky, he found that all distant galaxies were receding, or moving away from Earth.

Moreover, the further away a galaxy is, the faster it is moving away.

How should we interpret this?

Think raisin bread baked in the oven.

The dough will rise the same amount between each raisin.

If we consider the raisin as the stand-in for the galaxy and the batter as the intergalactic space, we can imagine that the stretching or expansion of the intergalactic space causes the galaxies to move away from each other, and that in any given galaxy, distant neighbors move a greater distance apart than their nearest neighbors in the same amount of time.

Sure enough, the equations of general relativity predict a cosmic tug-of-war between gravity and expansion.

Only in the dark voids between galaxies does expansion prevail and the universe stretches.

Here is our answer.

The universe is expanding by itself.

That said, cosmologists are pushing the boundaries of mathematical models to speculate on what exists beyond our spacetime.

These are not wild guesses, but hypotheses that address the twists in the Big Bang's scientific theory.

In the Big Bang, matter is predicted to be evenly distributed throughout the universe as sparse gas, but how did galaxies and stars form?

Inflation models describe short periods of incredibly rapid expansion that associate quantum fluctuations in the energy of the early universe with the formation of clumps of gas that eventually lead to galaxies.

If we accept this paradigm, it might mean that our universe represents a realm within a larger cosmic reality undergoing endless, eternal inflation.

We know nothing about this speculatively expanding reality, except for mathematical predictions that its infinite expansion can be driven by unstable quantum energy states.

However, in many local areas, energy could happen to settle into a steady state, inflation halting, and a bubble universe forming.

Each bubble universe (ours being one) will be described by its own big bang and physics.

Our universe will become part of a larger multiverse. There, inflation will occur forever at an alarming rate, making it impossible to meet the next universe.

The Big Bang also predicts that in the early, hot universe, our fundamental forces could be merged into one superpower.

Mathematical string theory suggests an explanation for this integration in addition to the basic structure of elementary particles quarks and electrons.

In these proposed models, vibrating strings are the building blocks of the universe.

Competition models for strings are now merged into a unified description, suggesting that these structures may interact with large, high-dimensional surfaces called branes.

Our universe may be contained within such a brane, floating in an unknown higher dimensional location playfully named "bulk" or hyperspace.

Other branes, including other types of universes, may coexist in hyperspace, and adjacent branes may even share certain fundamental forces, such as gravity.

Both eternal inflation and branes represent multiverses, but brane universes can collide with each other while universes are isolated in eternal inflation.

Echoes of such collisions can appear in the cosmic microwave background. It's a radiation soup spread throughout the universe, a remnant of the early Big Bang era.

So far, however, no such cosmic echoes have been discovered.

Some suspect that these different multiverse hypotheses will eventually merge into a common explanation, or be replaced by something else.

At the moment they are nothing more than speculative explorations of mathematical models.

Although these models have been inspired and guided by many scientific experiments, there are still few objective experiments to test them directly.

Until the next Edwin Hubble comes along, scientists will be debating the elegance of competing models...and dreaming about what lies beyond our universe.

From asteroids that could wipe out entire species, to gamma ray bursts and supernovae that could wipe out life on Earth, outer space has no shortage of forces that can wreak havoc on our tiny planet.

But there seems to be something scarier than any of these in the universe. It obliterates everything that comes near it.

Could the Earth be swallowed by a black hole?

A black hole is a very dense object that inevitably alters space and time around it, distorting it into infinite subsidence.

Even light cannot move fast enough to escape the gravitational pull of a black hole once it passes through a certain boundary known as the event horizon.

A black hole is therefore like a space vacuum cleaner with infinite capacity, swallowing everything in its path and letting nothing out.

To determine if a black hole could engulf the Earth, we first need to figure out where it is.

But how is that possible if it doesn't emit light?

Fortunately, we can observe their effects on the space around them.

When matter approaches a black hole, the enormous gravitational field accelerates matter to high speeds.

It emits a huge amount of light.

And even for objects that are too far away to be sucked in, the enormous gravitational force affects their trajectory.

Observing some stars apparently orbiting around a point in the sky, a black hole may be leading the dance.

Similarly, light passing near the event horizon is deflected in a phenomenon known as gravitational lensing.

Most of the black holes we have discovered can be classified into two main types.

Small ones, called stellar-mass black holes, have up to 100 times the mass of the Sun.

They form when a massive star consumes all of its nuclear fuel and its core collapses.

We have observed some of these objects from as far as 3000 light-years away, and there may be up to 100 million tiny black holes in the Milky Way galaxy alone.

So should we worry?

Probably not.

Despite their great mass, stellar black holes have radii of only about 300 kilometers or less, so the chances of them hitting us are very small.

However, their gravitational fields can affect planets from long distances, so even a direct collision can be dangerous.

If a typical stellar-mass black hole passed through Neptune's region, Earth's orbit would be drastically altered, with dire consequences.

Still, given how small stellar black holes are and how vast galaxies are, it follows that stellar black holes aren't much of a concern.

But we still have to deal with the second type, supermassive black holes.

Their masses are millions or billions of times greater than the Sun, and event horizons can span billions of kilometers.

These giants grew enormous by swallowing matter and merging with other black holes.

Unlike their stellar cousins, supermassive black holes do not wander through space.

Instead, they are at the centers of galaxies, including ours.

Our solar system is in a stable orbit at a safe distance of 25,000 light years around the supermassive black hole at the center of the Milky Way galaxy.

But that may change.

If our galaxy collided with another galaxy, the Earth could be flung toward the center of the galaxy and get close enough to a supermassive black hole to eventually be swallowed up.

In fact, a collision with the Andromeda galaxy is predicted to occur 4 billion years from now, which may not be good news for our home planet.

But before we judge black holes harshly, black holes are more than just destroyers.

They played a key role in the formation of the galaxies that make up our universe.

Far from being shadowy characters in the cosmic play, black holes have fundamentally contributed to making the universe a bright and wondrous place.

I would like to talk about the future of medicine.

Before that, I would like to talk a little bit about the past.

Now, throughout much of recent medical history, we have thought of disease and treatment in terms of a very simple model.

In fact, the model is so simple that it can be summed up in six words: get sick, take medicine, kill something.

Now, the reason this model has come to the fore is, of course, the antibiotic revolution.

For those of you who don't know, we just celebrated the 100th anniversary of the introduction of antibiotics in the United States.

But what you do know is that its introduction was truly transformative.

Here is a chemical, either from nature or artificially synthesized in the laboratory, that circulates through the body, finds a target and becomes trapped in that target (a microbe or part of a microbe), closing locks and locks with exquisite dexterity, exquisite specificity.

They will take on previously fatal diseases such as pneumonia, syphilis, and tuberculosis, and turn them into curable diseases.

You get pneumonia, take penicillin, kill microbes, cure your disease.

The idea was so captivating that it really took the whole biology by storm because it was such a powerful metaphor for locks and keys and something to kill.

It was a change like no other.

And we've spent the last 100 years practically replicating that model over and over again in non-communicable diseases, diabetes, hypertension, heart disease, and other chronic diseases.

It worked, but only partially.

let me show off

If we consider all the chemical reactions in the human body, or all the chemical reactions that can occur in the entire universe, most people think the number is in the order of a million.

Let it be 1 million.

And here the question arises: what is the number or proportion of reactions that can actually be targeted across pharmacopeias, across medicinal chemistry?

Its number is 250.

The rest is chemical darkness.

In other words, 0.025 percent of all chemical reactions in the body are actually subject to this lock and key mechanism.

If we think of human physiology as a vast global telephone network with interacting nodes and interacting parts, all of our medicinal chemistry operates in a tiny nook at the edge of that network — the outer edge.

It's like everyone in Pharmaceutical Chemistry is a pole operator tinkering with 10-15 phone lines in Wichita, Kansas.

So what do we do with this idea?

What if we reorganized this approach?

In fact, it turns out that the natural world gives us a way to think about disease in a fundamentally different way than disease, medicine, or object.

In fact, the natural world is hierarchically organized upwards rather than downwards, and we begin with self-regulating, semi-autonomous units called cells.

These self-regulating, semi-autonomous units give rise to self-regulating, semi-autonomous units called organs, and these organs combine to form what we call humans, and these organisms ultimately live in partially self-regulating, partially semi-autonomous environments.

The beauty of this plan, a hierarchy that builds upwards instead of downwards, is that it also allows us to think about disease in a slightly different way.

Consider a disease like cancer.

Since the 1950s, we have tried pretty desperately to apply this lock-and-key model to cancer.

We have tried to kill the cells with various chemotherapy and targeted therapies, and as most of you know, it worked.

It is effective against diseases such as leukemia.

It worked for some breast cancers, but eventually the limits of the approach were reached.

In fact, it's only in the last decade or so that we started thinking about harnessing the immune system, remembering that cancer cells don't grow in a vacuum.

It actually grows inside the human body.

And could the ability of the organism, the fact that humans have an immune system, be harnessed to attack cancer?

In fact, it has led to some of the greatest new drugs in cancer.

And finally there is the level of the environment.

As you know, we don't think cancer changes the environment.

But let me give you an example of a seriously carcinogenic environment.

It's called a prison.

Loneliness, depression, confinement, and nicotine in a small white paper, one of the most powerful neurostimulants we know, combined with one of the most powerful addictive substances you know, creates a carcinogenic environment.

But you can also create an anti-carcinogenic environment.

For example, attempts are being made to create an environment and alter the hormonal milieu of breast cancer.

We are trying to change the metabolic environment of other forms of cancer.

Or get another illness, such as depression.

Again, since the 1960s and 1970s, we've tried desperately to stop the molecules working between nerve cells—serotonin and dopamine—and cure depression that way, and it worked, but it hit its limits.

And now we know that what we really need is to change, rewire, and modify the physiology of our organs and brains. And of course, study after study shows that talk therapy does just that, and study after study shows that combining talk therapy with drugs or pills is actually far more effective than either one alone.

Can you imagine a more immersive environment that would change depression?

Can you shut out the signals that cause depression?

Again, move up along this hierarchical organizational chain.

Perhaps the real issue here is not the drug itself, but the metaphor.

In the case of major chronic degenerative diseases such as kidney failure, diabetes, hypertension, and osteoarthritis, perhaps what we really need to do is change the metaphor of growing something rather than killing something.

And that is perhaps the key to reshaping the way we think about medicine.

Now, this idea of ​​change, of creating a change in perception, so to speak, came back to me in a very personal way about ten years ago.

About ten years ago, I spent most of my life as a runner. I went out for a run on Saturday morning and when I came back I woke up basically unable to move.

My right knee was swollen and I could hear the eerie sound of bones hitting bones.

And one of the perks of being a doctor is being able to order your own MRI.

And I had an MRI the next week and it looked like that.

Essentially, the cartilaginous meniscus between the bones had been completely torn off, shattering the bones themselves.

Now, for those of you who are sad to see me, let me give you some facts.

If you had an MRI of this whole audience, 60% would have these signs of bone and cartilage degeneration.

By age 70, 85% of all women have moderate to severe cartilage degeneration.

50 to 60 percent of men in this audience will have such symptoms.

So this is a very common disease.

Well, the second perk of being a doctor is being able to experiment with your disease.

So we introduced this process into our lab about 10 years ago and started a simple experiment to mechanically repair this degeneration.

We tried to reverse cartilage degeneration by injecting chemicals into the animal's knee cavity, and tried to summarize a very long and painful process, but basically to no avail.

nothing happened.

About seven years ago, a research student came from Australia.

The good thing about Australians is that they are accustomed to seeing the world upside down.

(Laughter) So Dan said to me, "Maybe it's not a mechanical problem.

Maybe it's not a chemical problem. Perhaps it's a stem cell problem. ”

So he had two hypotheses.

First, there are skeletal stem cells. Skeletal stem cells build the entire vertebrate skeleton, bone, cartilage, and the fibrous elements of the skeleton. Just like you have stem cells in your blood and you have stem cells in your nervous system.

And second, degeneration or dysfunction of this stem cell is probably responsible for osteochondral arthritis, a very common disease.

The question is, were you looking for pills when you really should be looking for cells?

So we changed our model and started looking for skeletal stem cells.

To put it simply again, about five years ago we discovered these cells.

They live in skeletons.

Here's a schematic and an actual photo of one of them.

The white ones are bones, and the visible red columns and yellow cells are cells that arise from a single skeletal stem cell. It is a column of cartilage, a column of bone that emerges from a single cell.

This cell is fascinating. They have four properties.

The number one reason is that they live where they should.

They live just below the surface of bones, beneath the cartilage.

In biology, it's place, place, place.

They then migrate to the appropriate areas to form bone and cartilage.

It's one.

There is an interesting property here.

They can be removed from vertebrate skeletons or grown in laboratory Petri dishes. And they are desperate to form cartilage.

Remember when you couldn't build cartilage for love or money?

These cells are dying to form cartilage.

They form curly hairs of cartilage around themselves.

Third, they are also the most efficient fracture repairers we have ever encountered.

These are tiny bones that were naturally healed from broken bones in mice.

These stem cells came in and almost completely repaired the yellow bone and the white cartilage.

When labeled with a fluorescent dye, it even appears that some kind of specialized cell adhesive can enter the area of ​​the fracture, fix it locally and stop functioning.

Well, number 4 is the creepiest. That is, their numbers decrease sharply, sharply, 10-fold, 50-fold with age.

And what actually happened is that we found ourselves in a perceptual shift.

We went looking for drugs and eventually found a theory.

And in a way we were hooked again on this idea of ​​the cell, the organism, the environment. Because we are thinking about osteoprogenitor cells now, we are thinking about arthritis in terms of cellular diseases.

And the next question was, do they have organs?

Could this be constructed as an organ outside the body?

Can cartilage be implanted at the site of trauma?

And perhaps most interestingly, can you quickly rise and create an environment?

We know that exercise rebuilds bones, but none of us try to exercise.

So can you imagine a way to passively load and unload bone so that degenerated cartilage can be recreated or regenerated?

And perhaps more interesting, and perhaps more important, is whether this model could be applied more globally outside of medicine.

As I said before, the problem is not to kill something, but to grow something.

And I think it raises the most interesting set of questions about how we think about medicine in the future.

Are your medicines cells instead of pills?

How do we grow these cells?

What can be done to stop the malignant growth of these cells?

We heard about the challenges in unlocking growth.

Could we implant a suicide gene into these cells to stop them from multiplying?

Is your drug an organ made outside the body and then transplanted inside the body?

Can it stop regression to some extent?

What if an organ needs memory?

In diseases of the nervous system, some of those organs had memories.

How can we transplant that memory?

Can these organs be saved?

Should each organ be developed and restored to fit the individual human being?

And perhaps most puzzling, could your drug be environmental?

Can you patent your environment?

In every culture, shamans have used the environment as medicine.

Can you imagine that for our future?

We talked a lot about models. I started this talk with the models.

So let's finish with a few thoughts on model building.

That is our job as scientists.

As you know, when an architect builds a model, he or she is trying to show a miniature world.

But when a scientist builds a model, he or she is trying to show the world in metaphor.

He or she is trying to create a new perspective.

The former is a scale shift. The latter is a change in perception.

Now, antibiotics have brought about a major change in the way we think about medicine, and they have done a great job of coloring and distorting the way we think about medicine over the last 100 years.

But we need new models to think about the future of healthcare.

That's the problem.

There's a popular trope that we haven't had a transformative impact on the treatment of disease because we don't have powerful enough drugs, and that's partly true.

But perhaps the real reason is that we don't have a strong enough mindset about pharmaceuticals.

Certainly, I would be happy if a new drug was developed.

But perhaps what really matters are three more intangible Ms: mechanism, model, and metaphor.

thank you.

(Applause) Chris Anderson: I love this metaphor.

How are you linked?

There is a lot of talk in techland about personalizing medicine, that we have all the data and that the future of medicine will be tailored specifically to your genome, your current situation.

Does that apply to this model here?

Siddhartha Mukherjee: That is a very interesting question.

We have been thinking deeply about personalization of medicine from the perspective of genomics.

That's because in today's medicine, to use the same word again, genes are such a dominant metaphor that the genome is thought to drive the individualization of medicine.

But of course the genome is only the end of a long chain of existence, so to speak.

Its chain of existence, in fact its first organized unit, is the cell.

Therefore, if we are really going to deliver health care in this way, we need to think about individualizing cell therapy, then individualizing organ or organism therapy, and finally personalizing immersion therapy according to the environment.

So at every stage, I think there's that metaphor and there's turtles all the way through.

Well, this one has personalization through and through.

CA: So when you say that drugs can be cells instead of pills, you're potentially talking about your own cells.

SM: Of course. CA: So it was converted into a stem cell and it was probably tested against all sorts of drugs or something, and it was ready.

SM: Probably not. This is what we do.

This is what is happening now, and indeed we are not moving away from genomics, but embedding it into so-called multidimensional, semi-autonomous autoregulatory systems like cells, organs and environments.

CA: Thank you.

SM: I'm happy. thank you.

Two twin domes, two diametrically opposed design cultures.

One is made from thousands of steel parts and the other from a single silk thread.

One is synthetic and the other is organic.

One is imposed on the environment and the other creates the environment.

One was designed for nature and the other by her.

Michelangelo said that when he saw raw marble, he saw a figure struggling to be free.

The chisel was Michelangelo's only tool.

But the creatures are not chiseled.

they grow up

And our cells, the smallest unit of life, contain all the information all other cells need to function and replicate.

Tools are also affected.

Since at least the Industrial Revolution, the world of design has been dominated by the rigors of manufacturing and mass production.

Assembly lines have defined a world of parts and shaped the imagination of designers and architects who have been trained to think of objects as collections of separate parts with separate functions.

However, homogeneous aggregates of materials are not found in nature.

Let's take human skin as an example.

Our facial skin is thin and has large pores.

The skin on our back is thicker and the pores are smaller.

One acts primarily as a filter and the other as a barrier, but it's the same skin, no parts or assemblies.

It is a system that gradually changes its function by changing its elasticity.

This is a split screen to represent my split worldview, between fleas and genes, between machines and organisms, between assembly and growth, between Henry Ford and Charles Darwin, the split personalities of all the designers and architects working today.

My two worldviews, left brain and right brain, analysis and synthesis, play out on two screens behind me.

My job, at its simplest level, is to integrate these two worldviews and move away from the collective and toward growth.

You're probably asking yourself why now.

Why wasn't this possible 10 years ago, or even 5 years ago?

We live in a very special time in history, a rare time, when four disciplines converge to give designers access to previously inaccessible tools.

These disciplines are computational design and enable you to design complex forms with simple code. Additive manufacturing. Parts can be manufactured by adding material instead of cutting it out. Materials engineering allows you to design the behavior of materials with high resolution. And synthetic biology allows us to design new biological functions by editing DNA.

And at the intersection of these four fields, my team and I create.

Touch the hearts and hands of the students.

We design objects, products, structures and tools on a variety of scales, from something as large as an 80 foot diameter robotic arm with a vehicle base that will someday print an entire building, to nanoscale graphics made entirely of GMOs that glow in the dark.

Here we have reimagined the mashrabiya, the archetype of ancient Arabian architecture, creating a screen in which every opening is uniquely sized to shape the shape of the light and heat that travels through it.

The next project explores the possibilities of creating capes and skirts. This was for the Paris Fashion Show with Iris Van Herpen. Rigid contours, flexible around the waist, like a second skin made from a single piece.

Working with my longtime 3D printing collaborator Stratasys, I 3D printed this cape and skirt with no seams between cells. We will introduce more similar objects.

This helmet combines hard and soft materials with a resolution of 20 microns.

This is the resolution of human hair.

This is also the resolution of CT scanners.

Having access to such high-resolution analysis and synthesis tools for designers allows them to design products that fit not only the body shape, but also the physiological makeup of the tissue.

Next, we designed an acoustic chair, a chair that is both structurally comfortable and sound absorbing.

My collaborator Professor Carter and I sought inspiration from nature to design this irregular surface pattern for sound absorption.

We printed 44 different properties of hardness, opacity and color on the surface that correspond to pressure points on the human body.

Its surface, as in nature, changes its function not by adding another material or another assembly, but by continuously and subtly changing material properties.

But is nature ideal?

Does nature have no parts?

I didn't grow up in a devout Jewish family, but my grandmother used to tell me stories from the Hebrew Scriptures when I was little. One of them stuck with me and has come to define much of what I hold dear.

she says: "On the third day of creation, God commanded the earth to grow fruit trees."

In this first fruit tree, no distinction was made between trunk, branches, leaves and fruit.

The whole tree was bearing fruit.

Instead, the land grew trees with bark, stems, and flowers.

The land created a world made up of parts.

I often ask myself, "What would design look like if the object were made from a single piece?"

Will we return to a better state of creation?"

So we looked for a biblical material, a fruit-bearing tree-like material, and we found it.

The second most abundant biopolymer on earth is called chitin, of which about 100 million tons are produced annually by organisms such as shrimps, crabs, scorpions and butterflies.

We thought that if we could adjust its properties, we could create a multifunctional structure from a single component.

that's what we did.

We called Legal Seafood -- (laughter) ordered a large quantity of shrimp shells, ground them, and made a chitosan paste.

By varying the concentration of chemicals, we were able to achieve a wide range of properties, from dark, hard and opaque to light, soft and transparent.

We built a robotically controlled extrusion system with multiple nozzles to print the structures on a large scale.

The robot changes material properties on the fly to create a 12-foot long structure made from a single material that is 100% recyclable.

Once the part is ready, let it dry and let it take its shape when exposed to air.

So why are we still designing with plastic?

As we learned yesterday, the air bubbles, a byproduct of the printing process, contained photosynthetic microorganisms that first appeared on Earth 3.5 billion years ago.

We worked with collaborators at Harvard University and the Massachusetts Institute of Technology to implant bacteria genetically engineered to rapidly capture carbon from the atmosphere and convert it to sugars.

For the first time, we were able to generate structures that seamlessly transitioned from beams to meshes and, at larger scales, to windows.

fruit-bearing fruit trees.

Using ancient materials from one of the first life forms on Earth, lots of water, and a little bit of synthetic biology, we were able to turn structures made out of shrimp shells into structures that act like trees.

And here is the best part. Objects that are designed to biodegrade can provide nutrients for marine life when placed in the ocean. Placing them in the soil will help the tree grow.

The next stage of exploration using the same design principles was the solar system.

We explored the possibility of creating life-sustaining clothing for interplanetary voyages.

To do that, we needed to be able to contain the bacteria and control its flow.

So, similar to the periodic table, we have devised our own table of elements. This is a computationally grown, additively manufactured, biologically enhanced new life form.

I like to think of synthetic biology as liquid alchemy, but instead of transforming precious metals, it just synthesizes new biological functions within very tiny channels.

It's called microfluidics.

To control the flow of these liquid bacterial cultures, we 3D printed our own channels.

For our first garment, we combined two microbes.

The first is cyanobacteria.

And the second is Escherichia coli, a bacterium that lives in the human gut.

One converts light into sugars, and the other consumes the sugars to produce biofuels that benefit the built environment.

Now, these two microbes never interact in nature.

In fact they have never met.

They came here and were designed to have a relationship in clothing for the first time.

Think of it as evolution by design, not evolution by natural selection.

To contain these relationships, we created a single channel resembling the gastrointestinal tract. This allows these bacteria to flow, changing their function along the way.

We then began growing these channels into the human body, varying the material properties according to the desired function.

If you want more photosynthesis, design a more transparent channel.

This wearable extinguisher system extends 60 meters from end to end.

That's half the length of a football field and ten times the length of our small intestine.

And this is the first public presentation at TED. Our first photosynthetic wearable liquid channel that glows with life in wearable clothing.

(Applause.) Thank you.

Mary Shelley said, "We are ugly creatures, but we are only half done."

What if design could provide the other half?

What if we could create structures that augment living organisms?

What if we could scan our skin, repair damaged tissue, and create a personal microbiome that sustains our bodies?

Think of this as a form of edited biology.

This whole planet-named collection, Wanderers, has never been fashion per se for me, but it has provided me with an opportunity to speculate about the future of humanity on earth and beyond, combining scientific insight with many mysteries and moving from the age of machines to a new era of symbiosis between our bodies, the microbes we inhabit, products and even buildings.

I call this material ecology.

For that, we must always return to nature.

You already know that 3D printers print materials in layers.

You also know that nature is not.

it grows. It adds sophistication.

For example, this silkworm cocoon creates a very sophisticated architecture, in which a metamorphosing house is created.

Additive manufacturing today has never come closer to this level of sophistication.

This is accomplished by combining two proteins at different concentrations rather than two ingredients.

One acts as the structure and the other as the glue or matrix that holds the fibers together.

And this happens on different scales.

The silkworm first attaches to the environment, builds a tensioned structure, and then begins spinning a compacted cocoon.

Tension and compression, the two forces of life are manifested in one material.

To better understand how this complex process works, we glued small earth magnets to silkworm heads and spinnerets.

By placing it inside a box with magnetic sensors, we were able to create this 3D point cloud and visualize the complex structure of the silkworm cocoon.

However, it was found that if the silkworms were placed on a flat surface instead of in a box, they would spin flat cocoons and still metamorphose in a healthy way.

Therefore, we started designing different environments and different scaffolds, and found that the cocoon shape, composition, and structure are directly affected by the environment.

Silkworms are often boiled to death in their cocoons, and their threads are unwound and used in the textile industry.

By designing this template, I realized that I could give shape to raw silk without boiling a single cocoon.

(Applause.) They will mutate in a healthy way and we will be able to create these things.

So we scaled this process up to architectural scale.

We had robots spin templates out of silk and place them on the site.

Knowing that silkworms migrate toward darker, colder regions, we used solar path maps to reveal the distribution of light and heat on the structure.

He then created holes, or openings, to trap the rays of light and heat, dispersing the silkworms into the structure.

We were ready to receive caterpillars.

We ordered 6,500 silkworms from an online silk farm.

And after four weeks of feeding, they were ready to rotate with us.

We carefully placed them on the bottom edge of the scaffold. Then they pupate as they spin, mate, lay eggs, and life starts all over again. Same as ours, but much shorter.

Bucky Fuller said tension is the greatest honesty, and he was right.

Spinning biological silk on top of robot-spun silk gives the entire pavilion a sense of integrity.

Over the course of two to three weeks, 6,500 silkworms rotate 6,500 kilometers.

Strange symmetry, but this is also the length of the Silk Road.

After hatching, moths lay 1.5 million eggs.

This may be used for 250 additional pavilions in the future.

These are the two worldviews.

One spins silk from robotic arms and the other fills the gaps.

If the final frontier of design is to bring the products and buildings around us to life, shaping the ecology of two materials, designers must integrate these two worldviews.

Of course this brings us back to the beginning.

This is the age of new design, the age of new creation. It takes us from nature-inspired design to design-inspired nature and challenges us to mother nature for the first time.

thank you.

(Thank you for applause. thank you.

(applause)

(Guitar music) I've been missing you for so long There was something in this tired head that I wanted to love instead But I was just thinking, I've got a lot of pictures, there's you in that dance dress But I feel silly in that dim light Right after seeing Kodak's joy and doing you The longer you got, the stronger my affection got, I was just thinking, just thinking, thinking that this ship was about to sink I'm tired of postcards, especially postcards with cute dogs and Cupid I'm tired of calling you, I'm tired of calling you, I'm tired of seeing you, I'm tired of dreaming that I slept with you Don't get me wrong, I still love you desperately in this tired head I just want us to love you instead But I just think and think I was just thinking, I was just thinking, I'm sick of calling you once a week thinking of long distance instead of kissing you, so baby I'm sinking, just sinking (Guitar music ends) (Applause) Thank you.

To sing is to share.

When you sing, you need to intimately understand what you are talking about, be willing to share that insight, and offer a piece of yourself.

I look for the intentions that I want to share in all things and ask what is the intention behind this architecture, this product, this restaurant, this meal.

And if your intention is to impress people or get a big round of applause at the end, you are receiving, not giving.

And this is the kind of song that everyone has their own version of.

The song is called "Home," and it's like, "This is where I'm from. Nice to meet you."

(Laughter) (Applause) (Piano music) Home is the voice of the birds early in the morning Home is a song that will always be remembered Home is the memory of the first day at school Home is a book to carry Home is an alleyway in a distant town Home is where I've been and want to be Home always feels home No matter where I wander I'll always find my way home No matter how far I go Flowers by the window Home is everything she told me Home never gave up Pictures Home smiles when you die Home tastes like apple pie I met a woman, she used to live in the same place And she said home was where you were born and raised I asked if it was okay.

And she said, I've been trying all my life to find my place, no matter where I walk, I'll always feel at home, no matter how far I go, I'll always feel this yearning, wherever I am, (piano music) (end of piano music) (applause)

In my lab, we build autonomous flying robots like the one you see flying here.

Unlike commercial drones you can buy today, this robot does not have GPS.

Without GPS, it would be difficult for such a robot to locate itself.

The robot scans its environment using on-board sensors, cameras and laser scanners.

Detect features from the environment and use triangulation methods to determine their position relative to the features.

And all these features can be put together in one map as you can see behind me.

This map then allows the robot to understand where obstacles are and navigate in a collision-free manner.

The next thing I want to show you is a series of experiments we did in our lab where this robot was able to travel long distances.

In the upper right you can see what the robot sees in the camera.

And on the main screen, of course, this is 4x faster, but the main screen shows the map under construction.

Here is a high resolution map of the corridors around our lab.

And soon we'll see it coming into our lab. You can tell by its cluttered appearance.

(Laughter) But the main thing I want to tell you is that these robots can build high resolution maps with a resolution of 5 centimeters, so someone outside the lab or outside the building can deploy these maps without actually going inside the building and guessing what's going on inside the building.

Now, there is one problem with such robots.

The first problem is that it is rather large.

It's big and heavy.

And these robots consume about 100 watts per pound.

And this makes the mission life very short.

The second problem is that these robots are loaded with sensors such as laser scanners, cameras, and processors, which end up being very expensive.

That drives up the cost of this robot.

So we asked ourselves. What are the inexpensive, lightweight, sensing and computing consumer products available at electronics stores?

And we invented the flying phone.

(Laughter) This robot uses a commercially available Samsung Galaxy smartphone. All you need is an app that you can download from the app store.

And you can see this robot reading letters (in this case, "TED"), looking at the corners of "T" and "E", triangulating from there, and flying autonomously.

That joystick is only there so Giuseppe can kill the robot if it goes crazy.

(Laughter) In addition to building these little robots, we're also experimenting with aggressive behavior like the one you see here.

So this robot is currently moving at 2-3 meters per second, actively pitching and rolling when changing direction.

Importantly, even in these highly unstructured environments, smaller robots that can move faster can be used.

And just as this bird, the eagle, gracefully adjusts its wings, eyes and legs to catch prey out of the water, so can our robot go fishing in this next video.

(Laughter) In this case, it's a Philadelphia cheesesteak hoagie grabbed out of thin air.

(Laughter) You can see that this robot is going at about 3 meters per second, which is faster than walking speed, and adjusting its arms, claws, and flight on the fly to achieve this maneuver.

In another experiment, we want to show how the robot coordinates its flight to control a suspended payload that is actually longer than the width of the window.

So to achieve this, you have to actually pitch and adjust altitude and swing the payload.

But, of course, we want these to be even smaller, and we're particularly inspired by bees.

So if you look at the bees, this is a slow-motion video, but the bees are so small, they have so little inertia (laughs) they don't care, but they bounce off my hand, for example.

This is a small robot that mimics the behavior of bees.

Smaller is better, because smaller sizes have lower inertia.

Less inertia -- (robot buzzing, laughter) Less inertia makes it more resistant to collisions.

And it makes you stronger.

So, just like these bees, we make little robots.

And this particular one weighs only 25 grams.

Power consumption is only 6 watts.

And it can move at 6 meters per second.

So normalizing this to that size would be something like a Boeing 787 traveling at ten times the speed of sound.

(Laughter) I'd like to show you an example.

This is probably the first mid-air collision planned at 1/20th normal speed.

They are traveling at a relative speed of 2 meters per second, which demonstrates the basic principle.

A surrounding 2-gram carbon fiber cage keeps the propellers from tangling, but essentially absorbs collisions and makes the robot react to them.

Small also means safe.

In my lab, in developing these robots, we started with the big ones and now we're getting to these little ones.

If you plot a histogram of the number of plasters ordered in the past, the number is currently decreasing.

Because these robots are really safe.

Small size has some drawbacks, and nature has found some ways to compensate for these drawbacks.

The basic idea is that they aggregate to form a large group, a herd.

Therefore, we are also trying to create a group of artificial robots in our laboratory.

And this is very difficult because you have to think about networks of robots.

And within each robot, we have to think about the interplay of sensing, communication and computation, which makes controlling and managing this network very difficult.

Thus, we are essentially robbing nature of the three organizing principles that enable the development of algorithms.

The first idea is that the robot should be aware of its neighbors.

They need to be able to sense and communicate with their neighbors.

This video explains the basic idea.

You have 4 robots. One of them was literally hijacked by a human operator.

But the robots will interact with each other, sense their neighbors, and basically follow them.

And there is one person who can lead this network of followers.

Again, it's not because all robots know where they're going.

This is because they are simply reacting to the position of their neighbors.

(Laughter) The next experiment demonstrates the second organizing principle.

And this principle is related to the principle of anonymity.

The key idea here is that the robots are unaware of the identities of their neighbors.

They are asked to form a circle, but no matter how many robots are introduced into the formation, or how many robots are pulled out, each robot will only react to the robot next to it.

It recognizes the fact that it needs to form a circle, but cooperates with its neighbors to form the shape without any center adjustment.

Putting these ideas together, the third idea is basically giving these robots a mathematical description of the shape they need to perform.

And these shapes can change as a function of time, and we see these robots starting out in a circular formation, changing to a rectangular formation, stretching into a straight line, and back to an elliptical shape again.

And they do this with the same kind of split-second coordination that you see in natural flocks in nature.

So why deal with flocks?

Let's talk about two applications that we are very interested in.

The first is about agriculture, which is probably the biggest problem we face in the world.

As you know, 1 in 7 people on the planet is malnourished.

Most of the land we can cultivate is already cultivated.

And while most systems around the world are becoming more efficient, our production system is actually becoming less efficient.

The main causes are water scarcity, crop diseases, climate change and several other factors.

So what can robots do?

We use an approach we call precision farming in our community.

The basic idea is to fly an aerial robot through an orchard and build a precise model of each individual plant.

So, much like personalized medicine, you might imagine wanting to treat every patient individually, but what we want to do is build models of individual plants and tell farmers what inputs each plant needs. The inputs in this case are water, fertilizers and pesticides.

Here we see a robot moving through an apple orchard. Soon you'll see two robots doing the same thing on the left.

What they are doing is essentially building a map of the orchard.

Inside the map is a map of all the plants in this orchard.

(robot buzzing) Let's see what these maps look like.

In the following video you can see the cameras used in this robot.

At the top left is basically a standard color camera.

There is an infrared camera in the left center.

And in the lower left there is a thermal camera.

And the main panel shows a 3D reconstruction of all the trees in the orchard as the sensor passes right next to them.

With information like this, we can do a few things.

The first and perhaps most important thing we can do is very simple. Count the number of fruits on all trees.

In this way, farmers can be told how much fruit there is on each tree and can estimate the yield in the orchard, optimizing the downstream production chain.

The second thing we can do is take a model of the plant, build a 3D reconstruction, estimate the crown size from it, and correlate the crown size with the amount of leaf area for each plant.

And this is called leaf area index.

So knowing this Leaf Area Index gives us basically a measure of how much photosynthesis is possible in any plant, which again tells us how healthy each plant is.

Combining visual and infrared information can also calculate metrics such as NDVI.

And in this particular case, we find that there are some crops that are inherently not doing as well as others.

This is easily identifiable from visual images as well as from a combination of both visual and infrared images.

And finally, one of the things we're interested in is detecting early onset of chlorosis. This is an orange tree, but you can tell basically by the yellowing of the leaves.

However, a robot flying overhead would easily spot this autonomously and report to the farmer that there is a problem with this section of the orchard.

Such a system would be very helpful, and we estimate that using a fleet of aerial robots could improve yields by about 10 percent and, more importantly, reduce inputs such as water by 25 percent.

Finally, I would like to applaud the people who actually create the future, Yash Margaonkar, Sican Liu and Giuseppe Roiano, who are responsible for the three demonstrations you saw.

thank you.

(applause)

A high forehead covered in disheveled black hair, a morbidly pale complexion, and dark sunken eyes with a deep intelligence and a deep sense of weariness.

The image of Edgar Allan Poe is not only instantly recognizable, but it also fits his reputation.

From prisoners strapped under the blades of a descending pendulum to crows refusing to leave the narrator's chamber, Poe's macabre and groundbreaking gothic horror tales have left a timeless mark on literature.

But what is it that makes Edgar Allan Poe one of the greatest American writers?

After all, horror was a popular genre at the time and had many practitioners.

Still, Poe stood out thanks to his meticulous attention to form and style.

As a literary critic, he identified two basic rules for the format of short stories. It should be short enough to read in one go, and every word should contribute to that purpose.

By mastering these rules, Poe holds the reader's attention and rewards him with an intense and idiosyncratic experience—what Poe called unity of effect.

It's often scary, but the impact goes far beyond fear.

Poe's stories use violence and horror to explore the contradictions and mysteries of love, grief, and guilt, while resisting simplistic interpretations and explicit moral messages.

And while they often allude to supernatural elements, the true darkness they explore is the human mind and its propensity for self-destruction.

"The Tell-Tale Heart" parallels a grisly murder and the killer's tender empathy for the victim, a connection that quickly returns to haunt him.

The title character of "Ligeia" rises from the dead through the corpse of her husband's second wife—or at least that's what the opium-addicted narrator thinks.

And when the protagonist of "William Wilson" violently confronts the man he believes has been following him, he may just be staring at himself in the mirror.

Through the pioneering use of an unreliable narrator, Poe must turn the reader into an active participant and determine if the narrator is likely to misunderstand or lie about the events they are telling.

Although best known for his short horror stories, Poe was actually one of the most versatile and experimental writers of the 19th century.

He invented the detective stories we know: The Murders in the Rue Morgue, followed by The Mystery of Marie-Roger, and The Stolen Letter. All three films feature the original armchair detective C. Auguste Dupin, who uses his genius and extraordinary powers of observation and reasoning to solve crimes that baffle the police.

Poe also wrote satires of social and literary trends, and sometimes hoaxes anticipating science fiction.

These included reports of balloon trips to the moon and reports of dying patients being hypnotized into a trance, allowing them to speak from the other side.

Working as an editor, Poe wrote hundreds of pages of book reviews and literary theories, as well as an adventure novel about the voyage to the South Pole and an astrophysical treatise.

The haunting hypnosis of Poe's poetry is essential to understanding Poe's career.

His most famous poem is Songs of Sorrow, or, as he puts it, "Melancholy and Endless Remembrance". "The Raven," in which the speaker projects sadness onto a bird that merely repeats a single sound, made Poe famous.

However, despite his literary success, Poe lived in poverty throughout his life, and his personal life was often as bleak as his writing.

He was haunted by the loss of his mother and wife, who died of tuberculosis at the age of 24.

Poe struggled with alcoholism and had frequent conflicts with other popular writers.

Much of his fame came from posthumous and very loose adaptations of his works.

Still, if he had known how much joy and inspiration his writing would bring to generations of readers and writers, he probably would have brought a smile to that famously brooding face.

Do you think the world will be better next year?

in the next ten years?

Can we end hunger, achieve gender equality and stop climate change in the next 15 years?

Well, according to the governments of the world, it is possible.

In recent days, world leaders met at the United Nations in New York and agreed on new global goals for global development by 2030.

These goals are the result of extensive consultation.

The global goal is what we humans want to be.

That's the plan, but can we get there?

Is this vision for a better world really achievable?

Well, I'm here today because I've run the numbers, and the answer, surprisingly, is that it's probably actually possible.

But in normal business this is not the case.

Now, the idea that the world would be a better place might seem a little fanciful.

Watching the news every day makes it seem like the world is going backwards instead of forwards.

Frankly, it's easy to be skeptical of grand announcements from the United Nations.

But please, please stop that distrust for a moment.

Because in 2001 the United Nations agreed to another goal, the Millennium Development Goals.

A key goal was to halve the proportion of people living in poverty by 2015.

The goal was to bring the poverty rate to 18 percent this year, up from the 1990 baseline, when 36 percent of the world's population lived in poverty.

Did we meet this goal?

No, it wasn't.

we have surpassed it.

Global poverty is expected to drop to 12% this year.

But that's not enough, there are still many problems in the world.

But the pessimists and despairers who say the world won't get better are just plain wrong.

So how did they achieve this success?

Well, a lot of that was due to economic growth.

The biggest reductions in poverty have been in countries such as China and India, which have experienced rapid economic growth in recent years.

So could we do the same trick again?

Can economic growth get us to the global goals?

To answer that question, we need to benchmark where the world is today against the global goal and figure out how far we need to travel.

But it's not easy. Because the global goals are not only ambitious, they are also quite complex.

The 17 goals have 169 targets and literally hundreds of metrics.

Some are fairly specific goals, such as ending hunger, while others are rather vague, such as promoting peaceful and tolerant societies.

To help with this benchmark, we use a tool called the Social Progress Index.

It measures everything the Global Goals aim to achieve, but it can be summed up into a single number that can be used as a benchmark to track progress over time.

The Social Progress Index basically asks three basic questions about society.

First of all, does everyone have the basic needs for survival: food, water, shelter, security?

Secondly, does everyone have what constitutes a better life: education, information, health, a sustainable environment?

And does everyone have the opportunity to improve their lives through rights, freedom of choice, freedom from discrimination and access to world-leading knowledge?

The Social Progress Index uses 52 metrics and sums them all up to create an aggregate score on a scale of 0-100.

And it turns out that performance is very diverse in today's world.

The best performing country is Norway, with 88 points.

The lowest performer, the Central African Republic, had a score of 31.

And if you add weights to different population sizes and add up all the countries, the global score is 61.

Specifically, it means that the average human being lives at roughly the same level of social progress as Cuba or Kazakhstan today.

That is the situation today. 61 out of 100.

What must be done to reach the global goal?

Now, the global goals are certainly ambitious, but they are not about turning the world into Norway in just 15 years.

Looking at the numbers, my estimate is that a score of 75 is not only a major breakthrough in human well-being, but is also considered to have achieved the goal of the Global Goals.

So your goal is 75 out of 100.

can i get there?

Well, the Social Progress Index can help you calculate this. As you may have noticed, there are no economic indicators there. There is no GDP or economic growth in the Social Progress Index model.

And it enables us to understand the relationship between economic growth and social progress.

Let me show you this chart.

So we put social progress on the vertical axis here, which is what the Global Goals are trying to achieve.

Higher is better.

And the horizontal axis is GDP per capita.

It means that the more you go to the right, the richer you are.

There we represent all the countries in the world as points and put a regression line on them that shows the average relationship.

What this tells us is that as we get richer, societal progress certainly tends to improve.

But as we get richer, every dollar of GDP gains us less and less social progress.

And now you can start building forecasts using this information.

This is the world in 2015.

It has a social progress score of 61 and a per capita GDP of $14,000.

And don't forget that the target we are trying to reach is 75 which is the target of the Global Goals.

Currently, GDP per capita is $14,000.

How wealthy will we be in 2030?

That's what we need to know next.

The best forecast we can find comes from the US Department of Agriculture, which predicts global economic growth to average 3.1% over the next 15 years. This means that by 2030, per capita GDP will be about $23,000, if our projections are correct.

So the question is, how much would society progress if we were richer?

I had a team of Deloitte economists look up the numbers and do the math, and they came back and said, If average global wealth goes from $14,000 to $23,000 a year, social progress increases from 61 to 62.4.

(Laughter) Exactly 62.4. Just a small increase.

This seems a little strange.

Economic growth seems to have really helped fight poverty, but it seems to have had little impact on achieving the global goals.

what happened?

Well, I think there are two.

The first is that, in a sense, we are victims of our own success.

We have exhausted the easy wins of economic growth and are now grappling with harder problems.

We also know that economic growth comes with costs as well as benefits.

There are costs to the environment and costs from emerging health problems such as obesity.

That's bad news.

We cannot reach the Global Goals simply by getting rich.

So are the pessimists right?

Well, maybe not.

Because the Social Progress Index also contains very good news.

Let's go back to the regression line.

This is the average relationship between GDP and social progress, and this is what our previous projections were based on.

However, as we have seen, there is actually a lot of noise around this trend line.

The takeaway from this, very simply, is that GDP is not destiny.

Some countries lag behind in social progress relative to their wealth.

Russia has abundant natural resources, but it also has many social problems.

China is growing rapidly economically, but has not made much progress on human rights and environmental issues.

India has a space program and millions of people don't have a toilet.

Now, on the other hand, some countries are outperforming in social progress relative to GDP.

Costa Rica has prioritized education, health and environmental sustainability and as a result has achieved very high levels of social progress despite having a fairly low GDP.

And it's not just Costa Rica.

From poor countries like Rwanda to rich countries like New Zealand, it turns out that it is possible to gain a lot of social progress without having a very large GDP.

This is very important. Because it tells us two things.

First of all, it tells us that we already have solutions in the world for many of the problems that the Global Goals seek to solve.

It also tells us that we are not slaves to GDP.

Our choices matter. By prioritizing people's well-being, we can make much more progress than GDP predicts.

ikura? Is it enough to reach the global goal?

Now let's look at some numbers.

What we already know: The world today scores 61 points on social progress, and 75 points where we want to be.

Relying solely on economic growth would reach 62.4.

So let's assume that we can bring the countries that are currently underperforming in social progress - Russia, China and India - up to average levels.

How much social progress will it bring us?

Well, that's 65 now.

It's gotten a lot better, but there's still a long way to go.

So what if we were a little more optimistic and all nations were a little better at turning wealth into happiness?

Well, let's go to 67.

And let's be even bolder this time.

What if every country in the world, like Costa Rica, chose to put human well-being first and use their wealth for the well-being of their people?

Well, we're close to 73 and very close to the global goal.

Can we meet the global goals?

Certainly not business as usual.

The flood of economic growth will not get us there if only the megayachts and the super-rich rise and the rest are left behind.

If we want to reach the global goals, we have to do things differently.

We need to prioritize social progress and really scale our solutions around the world.

I believe the Global Goals represent a historic opportunity, as world leaders are committed to achieving them.

Don't ignore your goals or fall into pessimism. Let them keep their promise.

And we need to hold them accountable and keep their promises by tracking their progress over the next 15 years.

Finally, I would like to end by introducing a method called the People's Report Card.

The People's Report Card puts all this data together into a simple framework we're all familiar with from school days to explain them.

We rate our performance against global goals on an F to A scale. F stands for the worst humanity, A for the best humanity.

Our world today scores a C-.

All global goals aim to reach A. That is why we can annually update the National Report Cards for the world and all nations of the world, and hold our leaders accountable for achieving this goal and delivering on this promise.

Because achieving the Global Goals will only happen if we do things differently, if our leaders do things differently, and for that we need to demand it.

Therefore, let's refuse normal business.

Demand another way.

Choose the world you want.

thank you.

(Applause) Bruno Giussani: Thank you, Michael.

Michael, I have one question. The Millennium Development Goals, set 15 years ago, seemed to apply to all countries, but in reality turned out to be the scorecard for emerging economies.

The new global goal is now decidedly universal.

They are calling on countries to show action and show progress.

As a civilian, how can you use notification cards to give pressure to action?

Michael Green: This is a very important point. That's a big shift in priorities. It's no longer a poor country problem, it's just a poverty problem.

It's in every country.

And any country will face challenges in achieving the global goals.

Unfortunately, even Bruno in Switzerland has work to do.

That's why we plan to produce these report cards for every country in the world in 2016.

That way we can really see how we are doing.

And no rich country gets consecutive A's.

And I think it's about providing a focal point for people to start demanding action and demanding progress.

BG: Thank you.

(applause)

The burly Miller, sober as to barely sit on a horse, rambles about the capricious wife of a grumpy old carpenter and her academic lover.

To get some alone time, the scholar and his wife use tricks such as feigning madness, staging a biblical flood, and public exposure.

But the parish clerk is also in love with his wife, and every night he comes and sings outside the house.

This got so annoying that she tried to scare him by having him hang his butt out the window and kiss him.

When this didn't seem to work, her scholar decided to fart in the same position, but this time the clerk was waiting with a bright red poker.

This may all sound like a crude joke, but it's part of one of the most respected works of English literature ever created: The Canterbury Tales, a seamless blend of the high and the low.

The work consists of 24 stories, each told by one of Chaucer's spirited characters.

Narrators include familiar medieval figures such as knights, clerk, and nuns, as well as lesser-known figures such as Reeve and Mancible.

The stories are written in Middle English and often look quite different from the language spoken today.

The language was used from the 12th to the 15th century and evolved from Old English due to increased contact with European Romantic languages ​​after the Norman Conquest of 1066.

Most of the Middle English alphabet is still well known today, including some archaic symbols such as yogh for the y, j, or gh sounds.

The story's talkative cast first meets at the Tabard Inn in Southwark.

they have a common journey. It is a pilgrimage to Canterbury to visit the shrine of the martyred Archbishop St. Thomas Becket, who was murdered in his cathedral.

Curious about personal details, the nosy innkeeper proposes a competition. Dinner will be served to those who tell the best stories.

Without the pilgrimage, many of these figures would never have had the opportunity to interact.

Medieval society followed a feudal system that separated the clergy and nobility from the working class of peasants and serfs.

By Chaucer's time, a professional class of merchants and intellectuals had also emerged.

Chaucer spent most of his life as a government official during the Hundred Years' War, traveling not only in his native England but throughout Italy and France.

This may have influenced the panoramic vision of his work, in which no level of society is more than a ridicule in the narrative.

Chaucer exploits the quirks of the characters' language—the cook's crude humor, Parson's solemn prose, and the squire's lofty concepts—to satirize their worldview.

The diversity of dialects, genres, and literary metaphors also make this work a vivid record of the many ways mediaeval audiences enjoyed themselves.

For example, tales of knightly courtly love, chivalry, and destiny are based on romance, while working-class storytellers' tales are generally comedies filled with scatological language, sexual deviance, and slapstick.

This variation has something for everyone, which is one of the reasons why readers continue to enjoy this work both in Middle English and in translation.

The story is over 17,000 lines long, but the prologue ambitiously introduces 29 pilgrims, each promising four tales, and the innkeeper won't award the winner.

Chaucer may have been too preoccupied with his opulent creations to choose a winner late. Or maybe I liked each character too much to choose.

Whatever the reason, this means that all readers are free to decide. Who wins is up to you.

When we think of cemeteries, we think of gaunt trees, rusty gates, crumbling stones, and lonely mourners.

But not so long ago, many cemeteries were vibrant places with flowers blooming and people strolling among the gravestones.

How did our cemeteries become what they are today?

Some have been around for centuries, like Wadi al-Salaam, the world's largest burial ground with more than 5 million people buried there.

But most of the places we recognize as cemeteries are much younger.

In fact, for most of human history, we didn't bury our dead at all.

Our ancient ancestors had many other ways to say goodbye to deceased loved ones.

Some were left in caves, others on trees and on top of mountains.

Still others were submerged in lakes, washed out to sea, ritually cannibalized, or cremated.

All these customs, though some may seem strange today, were ways of worshiping the dead.

In contrast, the first known burials, some 120,000 years old, were probably reserved for offenders and excluded from the usual ceremonies intended to honor the dead.

However, the first burial revealed several advantages over the others. Burial protected the bodies from carrion eaters and the elements, and protected loved ones from the spectacle of decay.

These advantages may have changed the mindset of ancient peoples towards tombs designed to honor the dead, making burials more common.

In some cases, these tombs contain practical or ritual items, suggesting a belief in an afterlife in which the dead would need such tools.

Communal burials first appeared in North Africa and West Asia about 10 to 15,000 years ago. This is about the same time that the first settlements began in these areas.

These burial grounds created a permanent place to mourn the dead.

The nomadic Scythians littered the steppe with grave mounds known as Kurgans.

The Etruscans built vast necropoles, gridded streets lined with tombs.

In Rome, both cremation urns and intact remains were kept in underground catacombs.

The word cemetery, or "bedroom", was first used by the ancient Greeks who built tombs in cemeteries on the edge of cities.

In medieval European cities, Christian churchyards not only provided a rare open space to house the dead, but also hosted markets, fairs, and other events.

Farmers even let their cows graze there, believing that the grass in the cemetery produced sweeter milk.

As cities grew during the Industrial Revolution, smaller urban churchyards were replaced by larger suburban cemeteries.

Cemeteries like the 110-acre Pere Lachaise Cemetery in Paris and the 72-acre Mount Auburn in Cambridge, Massachusetts were lush gardens filled with carved stones and ornate tombs.

Once a luxury only for the rich and powerful, individually marked graves are now available to the middle and working classes as well.

People visited the cemetery for funerals, but also for anniversaries, holidays, or simply to spend an afternoon outdoors.

By the late 19th century, the cemetery began to receive fewer visitors as public parks and botanical gardens proliferated.

Many old cemeteries are now lonely places.

Some keep visitors coming back with tours, concerts, and other attractions.

But even as we revive old cemeteries, we are rethinking the future of burial.

Cities such as London, New York and Hong Kong are running out of burial space.

Even where the space is not too tight, cemeteries permanently occupy land that otherwise could not be cultivated or developed.

Traditional burials consume materials such as metal, stone and concrete, and can contaminate the soil and groundwater with toxic chemicals.

As awareness of environmental costs grows, people are looking for alternatives.

Many people turn to cremation and related acts.

In addition to these traditional practices, people are now able to send their remains into space, fertilize trees, process them into gemstones, fireworks, and even tattoo ink.

In the future, such options may completely replace burial.

Cemeteries may be the closest memorials to those who have died, but they are just one step in an ever-evolving process of remembering and honoring the dead.

We all go to the doctor.

And we do so with trust and blind belief that the tests they're prescribing and the drugs they're prescribing are based on evidence—evidence designed to help us.

But the reality is that it's not always the case for everyone.

What if I told you that the medical discoveries of the last 100 years were based on only half the population?

I am an emergency doctor.

I was trained for medical emergencies.

It's life saving. How cool is that?

Well, lots of runny noses and scraped toes, but no matter who walks through the door to the ER, we order the same tests and prescribe the same medications, regardless of the patient's sex or gender.

Why?

We were never taught that there was a difference between men and women.

A recent government accountability survey revealed that 80% of drugs withdrawn from the market were due to side effects in women.

So let's think about that for a minute.

Why are side effects for women discovered only after a drug is launched on the market?

Did you know that it takes many years for a drug to go from idea to cell-tested in the lab, through animal testing, through human clinical trials, and finally through the regulatory approval process before doctors can prescribe it?

Not to mention the millions and billions of dollars required to go through that process.

So why would half of the population discover unacceptable side effects after it was over?

what's happening?

Well, it turned out that the cells used in that lab were male cells, the animals used in the animal experiments were also male, and the clinical trials were almost exclusively on males.

Why has the male model become a framework for medical research?

Let's take an example related to the media-famous sleep aid Ambien.

Ambian was launched over 20 years ago and since then hundreds of millions of prescriptions have been written, mostly for women. This is because women are more likely to suffer from sleep disorders than men.

But just last year, the Food and Drug Administration recommended cutting the dose in half for women only. Because women metabolize drugs more slowly than men, they found that they had more of the active ingredient in their bodies when they woke up in the morning.

And they are sleepy and behind the wheel of the car, risking a car accident.

And as an emergency physician, I can't help but wonder how many of the patients I've treated over the years have been involved in car accidents that could have been prevented if this kind of analysis had been done and acted on 20 years ago when this drug first came out.

How many other things need to be analyzed by gender?

What else are we missing?

World War II changed many things, one of which was the need to protect people from becoming victims of medical research without informed consent.

So much-needed guidelines and regulations were enacted, part of which was the desire to keep women of childbearing age out of medical research.

I was terrified of what would happen if something happened to the fetus during the research.

Who is responsible?

And scientists at the time actually thought this was a false blessing. Because, let's be honest, the male body is very homogenous.

They don't have the constantly fluctuating hormone levels that can confound the clean data you get when you have only men.

It was easier. It was cheaper.

Needless to say, at the time there was a common assumption that men and women were similar in every way, except for their reproductive organs and sex hormones.

So it was decided that a medical study was carried out on men and that the results would later apply to women.

What has this brought to the concept of women's health?

Women's health has become synonymous with reproduction: breasts, ovaries, uterus and pregnancy.

It is this term that we now call "bikini medicine".

And this remained so until about the 1980s, when the medical community and public health policy makers challenged the notion, realizing that excluding women from all medical research was actually doing them a disservice in that virtually nothing was known about the unique needs of female patients, other than reproductive issues.

Since then, an overwhelming amount of evidence has emerged showing how men and women differ in every way.

As you know, there is a saying in medicine that goes like this: "Children are not just little adults."

And we say that to remind ourselves that children actually have different physiology than normal adults.

That is why the specialty of pediatrics has come to attract attention.

And we are now doing research on children to improve their lives.

And I know the same can be said for women.

Women aren't just men with breasts and tubes.

But they have their own anatomy and physiology that deserve to be studied with equal intensity.

Consider the cardiovascular system, for example.

This branch of medicine has done the most to figure out why heart attacks look so different in men and women.

Heart disease is the leading cause of death in both men and women, but more women than men die within a year of having a heart attack.

A man may complain of a tearing pain in his chest, like an elephant sitting on his chest.

And this is called typical.

Women have chest pain too.

However, more women than men are likely to complain that they don't feel well, that they can't breathe enough air, or that they feel tired these days.

And, as I said, for some reason we call this atypical, even though women make up half the population.

So what is the evidence that helps explain some of these differences?

Anatomically speaking, the blood vessels that surround the heart are thinner in women than in men, and the ways in which these vascular diseases develop are different in women and men.

And because the tests we use to determine if someone is at risk of a heart attack were originally designed, tested, and perfected for men, they aren't so good at determining it for women.

Next, consider drugs. Common drugs we use, such as aspirin.

We give healthy men aspirin to prevent heart attacks, but did you know that giving healthy women aspirin is actually harmful?

It just tells us that what this is doing is just scratching the surface.

Emergency medicine is a fast-paced business.

How many important differences are available between men and women in life-saving medical fields such as cancer and stroke?

Or why do some people have more runny noses than others, or why do painkillers put into a bruised toe work for some people and not others?

The Institute of Medicine says all cells have a gender.

What does this mean?

Sex is DNA.

Gender is the way a person expresses themselves in society.

And as you can see from the transgender population, those two don't always match.

However, it is important to realize that from the moment of conception, every cell in our body (skin, hair, heart, lungs) contains our own unique DNA, and that DNA contains the chromosomes that determine whether we will be male or female, male or female.

It was previously thought that the sex-determining chromosomes depicted here (XY for males and XX for females) determined only whether a person was born with ovaries or testes. It was also believed that the sex hormones produced by these organs were responsible for the differences between the opposite sexes.

But we now know that theory was wrong, or at least a little imperfect.

And thankfully, scientists like Dr. Paige at the Whitehead Institute and Dr. Yang at UCLA who study the Y chromosome have found evidence that the sex-determining chromosome in every cell of our body remains active throughout life, which may explain differences in drug dosages and differences in disease susceptibility and severity between men and women.

This new knowledge is a game changer, and while it's up to scientists to continue discovering evidence for it, it's up to clinicians to start translating this data at their bedside today.

And to help with this, I am co-founder of a national organization called the Sex and Gender Women's Health Collaborative that collects all this data for use in education and patient care.

And we are working to bring medical educators to the table.

That's a big job.

It is changing the way medical education has been conducted since its inception.

But I believe them.

I know they will see the value of incorporating a gender perspective into their current curriculum.

It is about training future health care providers correctly.

And regionally, I am co-founder of the Division Sex and Gender in Emergency Medicine here at Brown University, within the Department of Emergency Medicine, whose research explores the differences between men and women in emergencies like heart disease, stroke, sepsis and substance abuse, but I also believe education is paramount.

We have created a 360 degree model of education.

We have programs for doctors, nurses, students and patients.

Because this cannot be left to medical leaders alone.

We all have a role to play in bringing about change.

But I have to warn you. This is not easy.

In fact it is difficult.

It is essentially changing the way we think about medicine, health and research.

It is changing our relationship with the healthcare system.

But there is no turning back.

We now know enough to know what we were not doing right.

Martin Luther King, Jr. said, "Change does not come on the wheels of necessity, but through continuous struggle."

And the first step to change is awareness.

This is not just about improving women's health care.

This is about individualized, personalized health care for everyone.

This recognition has the power to transform healthcare for men and women.

And from now on, I want you to ask your doctor if the treatment you're getting is specific to your gender or gender.

They may not yet know the answer.

But the conversation has started and we can all learn together.

Remember that your gender matters to me and my colleagues in this field.

thank you.

(applause)

good morning.

Let's take a look at the greatest icon, Leonardo da Vinci.

We are all familiar with his wonderful work, his drawings, paintings, inventions and writings.

But we don't know his face.

Thousands of books have been written about him, but his appearance has been and continues to be debated.

Even this famous portrait is not accepted by many art historians.

So what do you think?

Is this the face of Leonardo da Vinci or is it not?

Let's check.

Leonardo was a man who pulled everything around him.

He painted people, anatomy, plants, animals, landscapes, buildings, water, everything.

But no face?

I find that hard to believe.

His contemporaries wore the face seen here, front or three-quarters.

So surely a passionate painter like Leonardo must have painted a self-portrait from time to time.

Let's find them.

If we were to scan all his work and look for self-portraits, we would find his face looking at us.

So I went through all of his 700+ paintings looking for portraits of men.

There are about 120. displayed here.

Which of these is a self-portrait?

For that, as you just saw, you have to do it in front or three-quarters.

Therefore, all profiles can be deleted.

It should also be detailed enough.

So you can also remove things that are very vague or very stylized.

And we know from contemporaries that Leonardo was very handsome and even beautiful.

So ugly things and caricatures can also be eliminated.

(Laughter) And let's see what happens -- there are only three candidates left who meet the requirements.

And here it is.

Yes, indeed, the old man is there, as is this famous pen drawing of Homo Vitruvianus.

And finally, Leonardo's only male portrait, The Musician.

Before I describe these figures, I must explain why I have the right to talk about them.

In my 300 years, which is 30 years, sorry, only 30 years, I've made over 1,100 portraits myself for newspapers.

(Laughter) But there are 1,100 of them, and few artists have painted that many faces.

So I know a little bit about drawing and analyzing faces.

Now let's take a look at these three portraits.

Then grab your seat. For if you zoom in on these faces you can see how they all have the same wide foreheads, level eyebrows, long noses, curved lips, and small, well-developed chins.

I couldn't believe my eyes when I first saw it.

There is no reason why these portraits should look alike.

All we did was look for portraits with self-portrait features and voila, they are very similar.

Now, are they made in the correct order?

A young man should be made first.

And as you can see from the year they were created, that is indeed the case.

They are made in the correct order.

How old was Leonardo at the time? Does that apply?

Yes, it is. He was 33, 38 and 63 when these were made.

So there are 3 possible photos of the same person who was the same age as Leonardo at the time.

But how do you know it's him and not someone else?

Well, I need references.

And this is the only widely accepted photo of Leonardo.

This is a statue of David by Verrocchio, in which Leonardo poses as a 15-year-old boy.

And now, when we compare the face of the statue with that of the musician, we see exactly the same features again.

This statue is the reference and ties Leonardo's identity to these three faces.

Folks, this story hasn't been published yet.

No wonder everyone here at TED hears and sees it first.

The icon within the icon finally has a face.

This is Leonardo da Vinci.

(applause)

As a singer-songwriter, people ask me about my influences, or what I like to call sonic genealogy.

And it's easy to say that I was shaped by the jazz and hip-hop I grew up with, the traditions of my Ethiopian ancestry, or the 1980s pop that was playing on the radio stations when I was a kid.

But beyond genre, there is another question. How do the sounds we hear every day influence the music we make?

I believe that the everyday soundscape can be the most unexpected inspiration for songwriting. And to look at this idea a little more closely, I'm going to talk about three things today. Nature, language, silence, the impossibility of true silence.

And through this, I hope that each of us, consciously or not, acts as an active participant and feels a world where musical expression is already alive.

We're going to start with nature today, but before that, let's listen to this brief snippet of an opera singer as a warm-up.

here it is.

(sings) (finishes singing) It's beautiful.

Gotcha!

That's not really the sound of an opera singer warming up.

It is a bird song that has been slowed down to such a speed that the human ear mistakenly recognizes it as a bird song.

The song was released as part of Peter Scheke's 1987 Hungarian recording "The Unknown Music of Birds," in which he recorded many birds and slowed them down to reveal what lies beneath.

Listen to the full speed recording.

(Birds chirping) Now let's hear the two together so your brain can recognize them side by side.

(Bird singing slowly and at full speed) (Ends singing) Incredible.

Perhaps the technique of opera singing was inspired by the chirping of birds.

We humans intuitively understand that birds are our musical teachers.

In Ethiopia, birds are considered an integral part of the origin of music itself.

The story goes like this. 1,500 years ago, a young man was born in the Aksum Empire, a major trading center of the ancient world.

His name was Jared.

When Jared was seven years old, his father died and his mother sent him to live with his uncle, a priest in the Ethiopian Orthodox tradition, one of the oldest churches in the world.

Now, there is an enormous amount of learning and learning in this tradition, and Jared had to study and study and study and study. One day, while he was studying under a tree, three birds came to him.

One by one, these birds became his teachers.

They taught him music, actually scales.

Jared, who was eventually recognized as Saint Jared, used these scales to compose five volumes of hymns and hymns for worship and celebration.

And he used these scales in his compositions, creating an indigenous musical notation.

These scales then evolved into what are known as kinits. It is a unique pentatonic pentatone modal system that continues to flourish and evolve in Ethiopia today.

Okay, I love this story. Because it's true on many levels.

Saint Jared is a real historical figure, and the natural world can be our musical teacher.

There are many examples of this. Congolese pygmies tune their instruments to the sounds of birds in the surrounding forest.

Musician and natural soundscape expert Bernie Krause explains how in a healthy environment animals and insects occupy the low, mid and high frequency bands, just like a symphony.

And countless musical compositions have been inspired by songs of birds and forests.

Yes, the natural world can be our cultural teacher.

Now let's go to the world of uniquely human languages.

All languages ​​communicate with varying degrees of pitch. In Chinese, variations in melody inflection give the same phonetic syllables very different meanings, whereas in languages ​​like English, the final pitch is higher...

(Raising the pitch) Do you mean the question?

(Laughter) As an Ethiopian-American woman, I grew up around Amharinya, the Amharic language.

It was my first language, my parents' language, and one of the main languages ​​in Ethiopia.

And there are countless reasons to fall in love with this language. A proverb that reveals the depth of its poetics, the double intention, the wax and the gold, the humor, the wisdom and folly of life.

But it also incorporates melodic musicality.

And I think this is best articulated in what I call emphatic expressions—emphasis, underlining, or surprise.

For example, consider the word "indey".

Now, if there is an Ethiopian in the audience, they are probably giggling to themselves. Because the word means something like "no!"

or "Why did he?" or "No, he didn't."

It depends.

But this was my favorite word when I was a kid. I think it's because of the pitch.

I have a melody.

It looks like it's coming out of someone's mouth.

“Indie” – go down and go up again.

And as a musician and composer, when I hear those words, this is what comes to my mind.

(sings music and 'inday') (music ends) Or, for example, consider a phrase that stands for 'it's right' or 'it's right', 'Lickih nehu... Lickih nehu'.

That's affirmative and agreeable.

"Ricky Neff"

When I hear this word, things start running through my head.

(music and sing 'Lickih nehu') (music ends) And in both cases what I did was I took the melody and phrasing of those words and phrases and converted them into pieces of music to use in these short compositions.

And I like to write basslines, so both ended up kind of like baselines.

Now, this is based on the work of Jason Moran and others who work closely with music and language, but it's also something that's been on my mind since I was a kid, reminding me of how musical my parents sounded when they were talking to each other and to us.

I learned from them and from Amharinya that every word we speak, every sentence, every word, every sentence we receive is saturated with musical expression.

Maybe you can still hear it in the words I speak.

Finally, we come to John Cage's 4:33, written for any instrument or combination of instruments, the most original work of 1950s America and 20th century avant-garde composition.

The musicians come on stage with stopwatches and ask them to open the scores that were actually purchased by the Museum of Modern Art - the scores.

And in this score for 4 minutes and 33 seconds, not a single note is written and not a single note is played.

And Cage, in a rage and euphoria at the same time, teaches us that even if you don't have fingers to pluck strings or hands to hit piano keys, there is still music, there is still music, there is still music.

And what is this music?

It was that back sneeze.

(Laughter.) It's an everyday soundscape that arises from the audience themselves. The audience coughs, sighs, rustles, whispers, sneezes, the rooms, the wood of the floors and walls stretches and contracts, creaks and moans with heat and cold, the pipes clatter.

And it was, and remains, controversial, but Cage's point is that there is no such thing as true silence.

Even in the quietest of environments, we hear and feel our own heartbeat.

The world lives in musical expression.

We are already immersed.

Well, I had a John Cage remix moment a few months ago while standing in front of the stove cooking lentils.

Late one night, when it was time to stir, I took the lid off the cooking pot and put it on the kitchen counter next door and the pot started rolling back and forth making this noise.

(The clatter of a metal lid hitting the counter) (The clatter ends) And it stopped me cold.

I thought, "How strange and cool is the swinging of the pot lid?"

So when the lentils were ready and ready to eat, I took them to my backyard studio and made this.

(music including lid clang and singing) (music ends) Now, John Cage didn't direct musicians to dig up soundscapes to transform sonic textures into music.

He was saying that the environment is what makes music in itself, it's generous, it's fertile, and we're already immersed.

Musician, music researcher, surgeon, and human hearing expert, Charles Lim is a professor at Johns Hopkins University, studying music and the brain.

And he has theorized that the human auditory system may have evolved to actually hear music, because the human auditory system is much more complex than language alone would require.

And if that's true, it means we're wired to music, music can be found everywhere, there's no such thing as a musical desert, we're always hanging out in an oasis, and that's great.

You can add it to your soundtrack, but it's already playing.

That doesn't mean you don't study music.

Study music, trace your sound genealogy, and enjoy exploring it.

But there is a certain sonic lineage to which we all belong.

So next time you're looking for percussion inspiration, look out for the tires rolling over the unusual grooves of the highway, the burner on the top right of the stove, and the strange click as it prepares to light.

For melodic inspiration, look no further than an orchestra of birds at dawn and dusk, or the natural resonance of stressed words.

We are the audience, we are the composers, we receive from the work we are given.

We make, make, make, make, knowing that the inspiration is endless when it comes to nature, language and soundscapes.

thank you.

(applause)

Father Daniel Berrigan once said, "Writing about prisoners is a bit like writing about the dead."

I think what he meant was that we treat prisoners as ghosts.

They are invisible and inaudible.

It's easy to simply ignore them, but it's even easier when governments are making every effort to cover them up.

As journalists, I think these stories of what those in power do when no one is watching are the stories we have to tell.

That's why I began investigating America's most secretive and experimental prison for so-called "second tier" terrorists.

The government calls these units Communications Management Units (CMUs).

Prisoners and guards call them "Little Guantanamo".

They are islands themselves.

But unlike Gitmo, they live here at home, floating inside a larger federal prison.

There are two CMUs.

One was set up inside a prison in Terre Haute, Indiana, and the other was set up inside a prison in Marion, Illinois.

Neither have undergone the formal vetting process required by law when they opened.

All CMU prisoners have been convicted.

Some of their cases are questionable, others involve threats and violence.

I am not here to debate the guilt or innocence of prisoners.

I'm here because, as Supreme Court Justice Thurgood Marshall said, "When jails and gates slam, prisoners do not lose their human qualities."

All the inmates I interviewed said that there are three spots of light in the darkness of prisons: phone calls, letters, and visits from family.

The CMU is not a solitary confinement cell, but it limits all of this to a level that matches or exceeds even the harshest prisons in the United States.

Their phone calls are limited to 45 minutes a month, while other prisoners have 300 minutes.

Their letters are limited to 6 sheets of paper.

Their visits could be limited to four hours a month, compared to people like Olympic Park bomber Eric Rudolph, who can stay in Supermax.

Moreover, CMU visits are contactless, so inmates are not even allowed to hug their family members.

"We are not tortured here, except mental ones," said one CMU prisoner.

The government has not disclosed who is imprisoned here.

However, some small windows into CMU have been opened through court documents, public records requests, and interviews with current and former prisoners.

There are an estimated 60 to 70 prisoners here, predominantly Muslim.

These include figures like Dr. Rafir Duffir, who violated economic sanctions on Iraq by sending medical supplies to Iraqi children.

That includes people like Yasin Aleph.

Aleph and his family fled to New York as refugees from Saddam Hussein's Iraq.

He was arrested in 2004 as part of an FBI sting operation.

Aleph was an imam and was asked to give a loan testimony, a tradition of Islamic culture.

It turns out that one of the people involved in the financing tried to get another person to cooperate in the fake attack.

Aleph didn't know.

He was therefore convicted of conspiracy to provide material support to terrorist organizations.

The CMU also includes non-Muslim prisoners.

Guards call them "balancers," meaning they help balance race numbers in hopes of avoiding lawsuits.

These balancers include animal rights and environmental activists like Danielle McGowan.

McGowan was convicted of participating in two arson attacks under the pretext of environmental protection as a member of the Global Liberation Front.

During sentencing, he feared being sent to a rumored secret terrorist prison.

The judge dismissed all these concerns as unsupported by any facts.

But that may be because the government has not fully explained why some prisoners are sent to the CMU and who is responsible for these decisions.

When McGowan was transferred, he was told it was because he was a "domestic terrorist," a term the FBI repeatedly uses when talking about environmental activists.

Now, keep in mind that there are about 400 inmates classified as terrorists in US prisons, and only a handful of them are in CMU.

McGowan, who previously served in a low-security prison, had no communications breaches.

So why was he moved?

Like other CMU prisoners, McGowan repeatedly asked for an opportunity to answer, hear, or appeal.

Another prisoner example shows how these demands are viewed.

"I would like to transfer." "I told him no."

At one point, the Warden himself recommended that McGowan be removed from CMU because of his good manners, but the Warden was overruled by the Bureau of Prisons' Counterterrorism Unit, which works with the FBI's Joint Counterterrorism Task Force.

I later learned that McGowan was actually sent to CMU because of what he said, not what he did.

The counter-terrorism memo cited McGowan's "anti-government beliefs."

During his imprisonment, he continued to write about environmental issues, saying activists must reflect on their mistakes and listen to each other.

Now, in all fairness, if you've spent any time in Washington, D.C., you know this is a really radical concept for government.

(Laughter) I actually asked to visit McGowan at CMU.

and I was approved.

It was quite a shock.

First, as I discussed earlier at this stage, I learned that the FBI was monitoring my work.

Second, it would make me the first and only journalist to visit CMU.

I even learned through the Bureau of Prisons Counter-Terrorism Unit that they were monitoring my speeches about CMU like this one.

So how does a visit get approved?

A few days before I went to jail, I received an answer.

I was allowed to visit McGowan as a friend, not as a journalist.

Journalists cannot enter here.

Mr. McGowan was told by CMU officials that if I asked any questions or published an article, he would be penalized for my reporting.

When I arrived to visit, the guard reminded me of who I am and what I know about my job.

And they said if I tried to interview McGowan, the visit would be cut off.

The Bureau of Prisons describes CMUs as "self-contained housing units."

But I think this is the Orwellian way of explaining black holes.

Visiting the CMU goes through all the expected security checkpoints.

But after that, the road to the meeting room was quiet.

Once visited by CMU inmates, the rest of the prison is locked down.

I was shown to a small room. The outstretched arm touches the wall.

A sphere the size of a grapefruit was installed in the ceiling, allowing West Virginia counter-terrorism units to monitor the visit live.

The unit insists that all visits to CMU prisoners must be conducted in English, which creates further difficulties for many Muslim families.

There was a thick plate of frosted bulletproof glass, and on the other side was Daniel McGowan.

We conversed through these wall-mounted handsets and talked about books and movies.

We did our best to find reasons to laugh.

While at CMU, for boredom and amusement, McGowan was secretly spreading rumors that I was president of the Twilight Fan Club in Washington D.C. (laughs) For the record, I'm not.

(Laughter) But I kind of hope the FBI thinks Bella and Edward are terrorist codenames.

(Laughter) During our visit, McGowan spent the most time talking about his niece Lily and his wife Jenny and how painful it was to never be able to hold them, never hold hands.

Three months after our visit, McGowan was transferred from CMU and then sent back again without warning.

I had posted the leaked CMU documents on my website, and the counter-terrorism unit announced that McGowan called his wife and asked her to mail the documents.

He was sent back to CMU because he wanted to know what the government had to say about him.

When he was finally released after serving his sentence, his story became even more Kafkaish.

He wrote an article for the Huffington Post headlined "Court documents prove I was sent to CMU for making a political speech."

The next day he was put in prison again for giving a political speech.

His lawyers quickly secured his release, but the message was very clear. It was like, "Don't talk about this place."

Nine years after the Bush administration opened the CMU, the government is codifying how and why it was created.

According to the Bureau of Prisons, these are for prisoners of "inspiring significance."

I think this is a very good way of saying that this is a political prison for political prisoners.

Prisoners are sent to CMU because of their race, religion, or political beliefs.

Now, if you think the characterization is too strong, take a look at some of the government's own documents.

When part of McGowan's mail was rejected by the CMU, the sender was told it was because the letter was "directed to political prisoners."

When another prisoner, animal rights activist Andy Stepanian, was sent to CMU, it was because of his anti-government and anti-corporate views.

Now, believe it all or not, we know it's happening right now in the United States.

But the lesser-known reality is that the United States has a dark history of unfairly punishing people for their political beliefs.

Before Marion became home to CMU in the 1960s, it was home to the infamous Control Unit.

Prisoners were kept in solitary confinement for 22 hours a day.

The commander said the unit was meant to "control revolutionary attitudes".

In the 1980s, another experiment called the Lexington High Security Force detained women associated with the Weather Underground, Black Liberation, and Puerto Rico's struggle for independence.

Prisons severely restricted communication and used sleep deprivation and constant lighting for so-called "ideological shifts."

These prisons were eventually closed due to the work of religious groups and human rights activists such as Amnesty International.

Civil rights lawyers from the Center for Constitutional Rights are now challenging the CMU for stripping prisoners of their due process rights in court and retaliating for protected political and religious speech.

Many of these documents would never have come to light without this lawsuit.

The message of these groups and my message to you today is that we must testify to what is being done to these prisoners.

Their treatment reflects values ​​held beyond prison walls.

This story is not just about prisoners.

it's about us.

It's about our own commitment to human rights.

It depends on whether we choose to stop repeating the mistakes of the past.

If we don't listen to what Father Berrigan describes as the story of the dead, it quickly becomes our own story.

thank you.

(Applause) (End of applause) Tom Riley: I have a few questions.

In high school, I learned about the Bill of Rights, the Constitution, Free Speech, Due Process, and about 25 other laws and rights that I thought were violated.

How could this happen?

Will Potter: I think this is the number one question I get throughout my work, but the short answer is people don't know.

I think the solution to these kinds of situations and infringements really depends on two things.

They rely on the knowledge that it is really happening and the means and effects to actually make the change happen.

And unfortunately, when it comes to these prisoners, first of all, people have no idea what is going on, they are not native English speakers, they are already disenfranchised people who have no access to lawyers.

Some of these cases have great representatives as I mentioned, but it's just that the public is unaware of what's going on.

TR: Isn't the right to council or access to council guaranteed in prisons?

WP: Our culture tends to assume that when people are convicted of a crime, whether the accusation is false or legitimate, whatever happens to them afterward.

And I think it's a very damaging and dangerous narrative that we have that allows this sort of thing to happen when the public just turns a blind eye to it.

TR: All the documents on the screen are real documents that have not been changed word for word, right?

WP: Of course. I actually uploaded them all to my website.

This is willpotter.com/CMU, a footnote version of the talk, so you can see the document yourself without the small snippets.

You can see the full version.

I relied overwhelmingly on primary source documents and primary interviews with former and current inmates and those dealing with this situation on a daily basis.

And, as I said earlier, I've been there myself.

TR: You are doing a brave job.

Wipe: Thank you. Thank you everyone.

(applause)

This is a small village called El near Lista.

It is right at the southernmost tip of Norway.

And on January 2nd of this year, an elderly village man went out to see what had been washed ashore in the recent storm.

And in the grass right next to the water, he found a wetsuit.

He thought it looked cheap because it was gray and black.

Two white bones protruded from each leg of the wetsuit.

It was clearly human remains.

And usually in Norway the identity of the deceased is quickly established.

Police then launched a search based on local missing persons reports and national missing persons reports to look for related accidents.

Nothing found.

So they ran a DNA profile and launched an investigation internationally through Interpol.

none.

This was the man no one seemed to lack.

It was an invisible life heading for a nameless grave.

However, a month later, Norwegian police received a message from Dutch police.

A few months ago, a body was found wearing the same wetsuit, but we had no idea who this person was.

However, Dutch police have managed to track down the wetsuit through an RFID chip sewn into the suit.

So they found that both wetsuits were purchased at the same time by the same customer by the English Channel in Calais, France on 7th October 2014.

But that's all they understood.

The customer paid in cash.

There was no surveillance footage of the store.

It became an unsolved case.

This story naturally left me and fellow photographer Tom Christiansen skeptical. "Who are these people?"

At the time, I had heard very little about curry, but it took me a few seconds to realize that curry is basically known for two things.

It is the closest place on the European continent to Britain, and many migrants and refugees stay in this camp, trying desperately to cross to Britain.

And there was a plausible theory about the very identity of the two men, which the police also put forward.

Because if you or I or someone with strong European ties were to go missing off the coast of France, people would know right away.

Your friends and family will report you missing, the police will come looking for you, the media will find out, your picture will be on a lamppost.

It is difficult to disappear without a trace.

But even if you just fled the war in Syria and have family, they don't necessarily know where you are and you're living illegally among the thousands of people who come and go every day.

Well, if one day you're gone, no one will notice.

No one knows you're gone, so the police won't come looking for you.

And this is what happened to Shadi Omar Qatf and Muaz al-Balki from Syria.

Myself and Tom visited Calais for the first time in April of this year. After three months of research, I was able to tell the story of how these two young men fled the war in Syria, ended up in Calais, bought a wetsuit, and drowned trying to swim across the English Channel to reach Britain.

This is a story about the fact that everyone has a name, everyone has a story, everyone is someone.

But it's also a story about what it's like to be a refugee in Europe today.

From here we started exploring.

It is located in Calais.

There are now between 3,500 and 5,000 people living in dire conditions here.

It is said to be the worst refugee camp in Europe.

Access to food, access to water, access to medical care is limited.

Diseases and infections are rampant.

And they're all trying to go to England to apply for asylum, and they're stuck here.

And they do it by hiding behind trucks heading to ferries and Eurotunnels, or sneaking into tunnel terminals at night and hiding inside trains.

Most people want to go to England. Because they know the language and find it easier to start their life over from there.

They want to work, they want to study, they want to keep living.

Many of these people are highly educated and skilled workers.

If you go to Calais and talk to refugees, you will meet lawyers, politicians, engineers, graphic designers, farmers and soldiers.

you have every spectrum.

But when we talk about refugees and immigrants, we lose sight of who these people are. Because we often do it statistically.

That means there are 60 million refugees worldwide.

About 500,000 people have crossed the Mediterranean into Europe so far this year, with about 4,000 staying in Calais.

But these are numbers, and those numbers say nothing about who these people are, where they came from, or why they are here.

First, I would like to talk about one of them.

I am Muaz al-Balki, 22 years old from Syria.

We first learned of him after visiting Calais for the first time in search of an answer to the two-corpse theory.

And some time later I heard about a Syrian man who lived in Bradford, England, and had been desperately looking for his nephew Muaz for months.

It turns out that the last time anyone heard anything from Muaz was October 7, 2014.

It was the same day I bought the wetsuit.

So we flew there to meet my uncle, took a DNA sample of him, and then obtained additional DNA samples from Muaz's closest relatives who now live in Jordan.

An analysis concluded that the body found in a wetsuit on a beach in Holland was in fact Muaz al-Balki.

And while we were doing all this research, we learned about Muaz.

He was born in 1991 in Damascus, the capital of Syria.

He grew up in a middle-class family, with his middle father a chemical engineer who served 11 years in prison for the Syrian rebels.

While his father was in prison, Muaz assumed responsibility and cared for his three sisters.

They said he was that kind of man.

Muaz studied to become an electrical engineer at the University of Damascus.

So a few years after the Syrian War began, the family fled Damascus for neighboring Jordan.

Their father was having trouble finding work in Jordan and Muaz was unable to continue his studies, so he thought, ``Well, the best thing I can do to help my family is finish my studies and go somewhere else where I can find a job.''

So he goes to Türkiye.

In Turkey, they were not allowed to enter universities, and once they left Jordan as refugees, they were not allowed to re-enter.

So he decides to go to England where his uncle lives.

He entered Algeria, walked into Libya, paid smugglers to help him cross to Italy by boat, and from there to Dunkirk, a city right next to Calais on the English Channel.

We know he made at least a dozen unsuccessful attempts to cross the English Channel by hiding in a truck.

But at some point he must have given up all hope.

The last night he was found alive, he spent in a cheap hotel near the train station in Dunkirk.

His name was found in the records, but it appears he was staying there alone.

The next day he went to Calais with Shadi Kataf and entered the sports shop a few minutes before 8pm.

They both bought wetsuits, but the woman at the store was the last person we knew to see them alive.

We tried to find out where Shadi met Muaz, but we weren't able to.

But they also have similar stories.

We first learned of Shadi after his cousin in Germany read an Arabic translation of Muaz's story on Facebook.

So we contacted him.

Shadi, a few years older than Muaz, also grew up in Damascus.

He was the hard working type.

He ran a tire repair shop and then worked for a printing company.

He lived with a large family, whose home was bombed early in the war.

The family then fled to an area known as Camp Yarmouk in Damascus.

Yarmouk is said to be the worst place to live on earth.

They have been bombed by the military, surrounded, raided by ISIS and deprived of supplies for years.

There was a UN staff member who visited last year, and he said, "The grass was all eaten and there was no grass left."

Out of a population of 150,000, only 18,000 are believed to remain in Yarmouk.

Shadi and his sisters went outside.

Parents are still trapped inside.

So Shadi and one of his sisters fled to Libya.

This was after the fall of Gaddafi and before Libya plunged into full-blown civil war.

And in the last remaining stable in Libya, Shadi took up scuba diving and seems to have spent most of his time in the water.

He was totally obsessed with the sea and hoped to find work as a diver once he got to Italy when he finally decided in late August 2014 that he was no longer in Libya.

Reality was not so easy.

We don't know much about his travels because he struggled to communicate with his family, but we do know he struggled.

And by the end of September he was living on the streets somewhere in France.

On October 7, he called his cousin in Belgium and explained his situation.

He said, "I'm in Calais. Please come pick up my backpack and laptop."

I can't afford to pay a smuggler to help me get to the UK, but I'm going to buy a wetsuit and swim."

Of course, his cousin tried to warn him against doing so, but Mr. Shadi's phone ran out of battery and the phone wouldn't turn on again.

The wreckage of Shadi was found nearly three months later in a wetsuit on a Norwegian beach 800km away.

He is still awaiting his funeral in Norway, but none of his family will be able to attend.

Many people might think that the story of Shadi and Muaz is about death, but I don't think so.

For me, this is a story about two questions that I think everyone shares. What is a better life and what am I going to do to achieve it?

And for me, and probably for many, a better life means being able to do more of the things we think are meaningful, like spending more time with family and friends, traveling to exotic places, or simply earning money to buy a cool new device or new sneakers.

And all this is within our reach.

But when fleeing a war zone, the answers to these two questions are very different.

A better life is a safer life.

It's a life with dignity.

A better life means not having your home bombed or being kidnapped.

That means you can send your kids to school, college, and find a job that will support you and your loved ones.

A better life is a future with some possibilities, compared to a future with few possibilities, which is a strong motivator.

And I have no trouble imagining that most of us would be willing to do just about anything after spending weeks, possibly months, as second-class citizens, living on the streets and in horrible makeshift camps with stupid and racist names like “Jungle.”

If I could ask Shadi and Moores the moment they stepped into the icy waters of the English Channel, they'd probably say 'this is worth the risk'. Because they didn't see any other option.

It's hopeless, but that's the reality of living as a refugee in Western Europe in 2015.

thank you.

(Applause) Bruno Giussani: Thank you, Anders.

This is Tom Christiansen. The guy who took most of the pictures you see and wrote the report with.

Tom, you two have recently returned to Calais.

This was our third trip.

This was after the article was published.

what changed? what did you see there?

Tom Christiansen: When I first went to Calais, there were about 1,500 refugees.

They went through a difficult time, but they were positive and hopeful.

The last time the camp was bigger, maybe 4,000 or 5,000 people attended.

It appears to be more permanent, NGOs have arrived and small schools have been opened.

But the problem is that the refugees have stayed longer and the French government has successfully closed the borders, so now the jungle is expanding and despair and hopelessness are growing among the refugees.

BG: Do you have plans to go back and continue reporting?

TC: Yes.

BG: Anders, I'm a former journalist, and it's surprising to me that Dougblade agreed to provide so many resources for this article, which speaks volumes about newspaper responsibility in the current climate of cut budgets and publishers in crisis, how did you sell it to editors?

Anders Fjellberg: It wasn't easy at first because I didn't know what I could actually understand.

As soon as it became clear that we could actually identify who the first one was, we basically got the message that you can do whatever you want, travel wherever you want to go, do whatever you want to do, and just let this end.

BG: That's the editor's responsibility.

By the way, this story has been translated and published in several European countries and will continue to be translated.

And we would love to read updates from you. Thank you Anders. Thank you, Tom.

(applause)

A few years ago, together with my colleague Emmanuel Charpentier, I invented a new technique for genome editing.

It's called CRISPR-Cas9.

Using CRISPR technology, scientists can make changes to the DNA inside cells, which could potentially treat inherited diseases.

You may be curious to know that CRISPR technology was born through a basic research project aimed at discovering how bacteria fight viral infections.

Bacteria have to deal with viruses in the environment. A virus infection can be thought of as a ticking time bomb. It takes just a few minutes for the germs to defuse the bomb.

Therefore, many bacteria have an adaptive immune system called CRISPR in their cells that can detect and destroy viral DNA.

Part of the CRISPR system is a protein called Cas9, which can seek out, cleave, and ultimately degrade viral DNA in a specific way.

Through my research to understand the activity of this protein, Cas9, I realized that its function could be used as a genetic engineering technique. It's a way for scientists to delete or insert specific bits of DNA into cells with astonishing precision, offering the opportunity to do things that were practically impossible before.

CRISPR technology has already been used to alter the DNA inside the cells of mice, monkeys, and other organisms.

Chinese scientists recently showed that CRISPR technology can also be used to alter the genes of human fetuses.

And Philadelphia scientists have shown that CRISPR can be used to remove integrated HIV viral DNA from infected human cells.

The opportunity to do this kind of genome editing also raises various ethical issues that we must consider. Because this technique can be used not only in adult cells, but also in the embryos of organisms, including our own species.

So, along with my colleagues, I have called for a global dialogue about the technologies I co-invented so that we can consider all the ethical and social implications of such technologies.

What I want to do now is tell you what CRISPR technology is, what it can do, where we are today, and why I think we need to take a cautious path in adopting this technology.

When a virus infects a cell, it injects its DNA.

And in bacteria, the CRISPR system allows DNA to be pulled out of the virus and inserted piece by piece into the chromosome (bacterial DNA).

These integrated viral DNA bits are then inserted into sites called CRISPRs.

CRISPR stands for clustered regularly spaced short palindromic repeats.

(Laughter) In a nutshell, you can see why we use the acronym CRISPR.

This is the mechanism that allows cells to record exposed viruses over time.

And importantly, these DNA bits are passed on to the cell's progeny, thus protecting the cell from the virus for generations, not just one.

This allows the cell to record an infection, and as my colleague Blake Wiedenhoeft likes to say, the CRISPR locus is effectively a genetic vaccine card in the cell.

When these DNA bits are inserted into the bacterium's chromosome, the cell makes a small copy of a molecule called RNA (orange in this picture). This is the exact replication of viral DNA.

RNA is a chemical relative of DNA, allowing it to interact with DNA molecules that have matching sequences.

Therefore, these small RNAs from the CRISPR locus bind to a protein called Cas9, which is white in the picture, forming a complex that acts like a sentinel inside the cell.

Searches all DNA in the cell for sites that match the sequence of bound RNA.

And when these sites are found (as you can see here, the blue molecule is DNA), this complex binds to that DNA, allowing the Cas9 cleaver to cut the viral DNA.

Makes a very precise break.

Therefore, the Cas9 RNA sentinel complex can be thought of as a pair of scissors that can cut DNA. Cuts the double strand of the DNA helix.

And importantly, the complex is programmable, so it can be programmed to recognize a specific DNA sequence and cut the DNA at that site.

As we will discuss, we have used its activity for genome engineering, realizing that cells can make very precise changes to the DNA at the site where this break is introduced.

This is similar to using a word processing program to fix typos in your document.

We envisioned using the CRISPR system for genome engineering because cells have the ability to detect and repair damaged DNA.

Therefore, when a plant or animal cell detects a double-strand break in its DNA, it can either repair the break by slightly altering the sequence at that position and patching the ends of the broken DNA together, or it can repair the break by incorporating a new piece of DNA at the break site.

Therefore, if we had a way to introduce double-strand breaks at precise locations in DNA, we could prompt cells to repair those breaks by either breaking them or incorporating new genetic information.

So, for example, if CRISPR technology could be programmed to cut DNA at or near a mutation that causes cystic fibrosis, it could trigger the cell to repair that mutation.

Genome engineering is actually nothing new and has been in development since the 1970s.

We have the technology to sequence DNA, copy DNA, and even manipulate DNA.

And while these technologies were very promising, the problem was that they were either inefficient or so difficult to use that few scientists adopted them for use in their own laboratories, or for many clinical applications.

Therefore, the opportunity to leverage technology like CRISPR is attractive because of its relative simplicity.

You can think of old genome-engineering techniques in the same way that you have to rewire your computer every time you run new software, but CRISPR technology is like software for your genome, and you can easily program it with these tiny pieces of RNA.

Therefore, once a double-strand break is made in DNA, it can induce repair, which has the potential to do amazing things, such as correcting the mutations that cause sickle cell anemia and Huntington's disease.

I actually think the first application of CRISPR technology will be in blood. Delivering this tool to cells is relatively easy in blood compared to solid tissue.

Much of the current research applies to animal models of human disease, such as mice.

This technique is used to make highly precise changes that allow us to study how these changes in a cell's DNA affect a tissue, or in this case, an entire organism.

In this example, we used CRISPR technology to disrupt the gene responsible for black coat color in mice by making subtle changes to the DNA.

Imagine that these white mice are otherwise perfectly normal, unlike their pigmented littermates with just a tiny change in one gene across their genome.

And when we sequence the DNA of these animals, using CRISPR technology, we find that DNA changes occur exactly where we provoke them.

Additional experiments are being conducted in other animals, such as monkeys, to help create models of human disease.

And here we find that these systems can be used to test the application of this technology in specific organizations. For example, we can figure out how to deliver CRISPR tools to cells.

We also want to better understand how to control the way DNA is repaired after it has been cut, and we also want to find ways to control and limit any kind of off-target or unintended impact of the use of technology.

I believe that within the next ten years, this technology will certainly be clinically applied to adults.

In the meantime, clinical trials are likely to take place, and in some cases the treatment is likely to be approved, which is very exciting to think about.

And the excitement over this technology has generated a lot of interest in the startups that are being set up to commercialize CRISPR technology, as well as the many venture capitalists investing in these companies.

However, we also need to consider that CRISPR technology can be used for enhancements and more.

Imagine being able to manipulate humans with even desirable traits, such as stronger bones, less cardiovascular disease, different eye color, or even taller height.

A “designer”, so to speak.

At this time, very little genetic information is known to understand what kind of genes produce these traits.

However, as knowledge of CRISPR technology becomes available, it is important to know that CRISPR technology provides the tools to make such changes.

This raises a number of ethical issues that we must consider carefully, and this is why I and my colleagues have called for a global moratorium on the clinical application of CRISPR technology to human embryos, to give us time to seriously consider all the implications of doing so.

And indeed, an important precedent for such a moratorium was when scientists came together in the 1970s to demand a moratorium on the use of molecular cloning until the technology's safety was carefully tested and validated.

So, while genome-engineered humans don't exist yet, this is no longer science fiction.

Genome-engineered animals and plants are happening now.

And this places a great responsibility on all of us to carefully consider both the unintended consequences and the intended effects of scientific progress.

thank you.

(Applause) (End of applause) Bruno Giussani: Jennifer, as you pointed out, this is technology that has a huge impact.

Your attitude of asking for a pause, pause, or quarantine is incredibly responsible.

Of course, some of these are therapeutic, but some are non-therapeutic, and they seem to be getting a lot of attention, especially in the media.

This is one of The Economist's latest issues, The Compilation of Humanity.

It's all about gene enhancement, not treatment.

What was the response from your scientific colleagues in March when you asked or suggested that you should really stop and think about this for a moment?

Jennifer Doudna: I think my colleagues were really happy to have the opportunity to talk openly about this.

What's interesting is that talking to my scientific colleagues and others, there are different perspectives on this.

It is therefore clear that this is a subject that requires careful consideration and discussion.

BG: There's a big conference coming up in December that you and your colleagues are calling along with the National Academy of Sciences and others, what are you really hoping to get out of that conference?

JD: Well, I'd love to hear the voices of various individuals and stakeholders who want to think about how to use this technology responsibly.

It may not be possible to find a consensus point of view, but I think we should at least understand what the challenges ahead are.

BG: Now, your colleagues, like George Church at Harvard, say, "Well, ethics issues are basically just safety issues.

We do a lot of testing on animals and labs, and when it's safe enough, we move on to humans. ”

So it's kind of another way of thinking that we should really take this opportunity and really work on it.

Is it possible for the scientific community to disagree on this matter?

In other words, will some hold back because of ethical concerns, and others move forward because some countries have poor or no regulation at all?

JD: Well, I think with any new technology, especially with this one, there are different perspectives, and I think it's understandable enough.

Ultimately, I believe this technology will be used for human genome engineering, but I do not believe it is our responsibility to do so without careful consideration and discussion of the risks and potential complications.

BG: Like you, there are many exponentially developing technologies and other scientific fields.

I'm thinking about things like artificial intelligence and autonomous robots.

With the exception of autonomous combat robots, no one seems to have initiated a similar discussion calling for a moratorium in these areas.

Do you think your discussion could become a blueprint for other areas?

JD: Well, I think it's hard for scientists to get out of the lab.

Speaking for myself, I'm a little uncomfortable doing that.

However, I believe that being involved in the creation of this issue really puts me and my colleagues in a position of responsibility.

And just as we like to look at what might impact other fields outside of biology, we certainly hope other technologies will be looked at in the same way.

BG: Jennifer, thank you for coming to TED.

JD: Thank you.

(applause)

First of all, I would like to ask you to go to your happy place.

So your happy place, I know you have it, even if it's fake.

(laughs) Yes, so are you comfortable?

good.

Now, I would like you to answer the following questions in your heart.

Do you have strip lighting in your happy place?

Do you have a plastic table?

polyester floor?

mobile phone?

no?

I think we all know that our happy places are outdoor, natural places like the beach or by the fireplace.

I read, eat, and knit.

And we are surrounded by natural light and organic elements.

Natural things make us happy.

And happiness is a great motivator. We strive for happiness.

Perhaps that's why we're constantly redesigning everything in hopes that our solution will feel more natural.

So let's start there first. Start with the idea that good design should feel natural.

Your cell phone is not very natural.

And while you probably think you're a phone addict, you really aren't.

We are not dependent on our devices, we are dependent on the information flowing through them.

How long can you stay happy in your own happy place without any information from the outside world?

I'm interested in how we access and experience that information.

We are transitioning from the age of static information stored in books, libraries and bus stops to the age of digital information to the age of fluid information. From quantum physics to medieval viticulture, from gender theory to tomorrow's weather, kids will expect access to everything, anytime, anywhere, just like flipping a light bulb. Please try to imagine.

Humans also like simple tools.

A mobile phone is not such a simple tool.

A fork is a simple tool.

(Laughter.) And I don't like plastic phones much like I don't like cell phones. That's not how I want to experience information.

I think there is a better solution than the world through the screen.

I don't hate screens, but I don't think anyone feels better about how much time they spend slouched over them.

Fortunately, big tech companies seem to agree.

They've actually invested heavily in touch, sound, gestures, and even senses, potentially transforming silly objects like cups, imbuing them with the magic of the internet, and turning this digital cloud into something we can touch and move.

Parents facing a screen time crisis need physical digital toys to teach their kids to read and a safe app store for families.

And actually, I think it's already happening.

Reality is richer than the screen.

For example, I love books.

To me they are time machines, atoms and molecules bound in space from the moment of creation to the moment of my experience.

But frankly on my phone the content is the same.

So what makes this a richer experience than the screen?

In other words, scientifically.

Of course you need a screen.

I'm going to show a movie, so I need a huge screen.

But that's not all you can do with these magic boxes.

Your mobile phone is not your gateway to the Internet.

(Laughter) We can use physics and pixels to build physical things that can integrate the internet into the world around us.

Here are some examples of those.

Some time ago, I decided to work with design firm Berg to explore what the screenless internet would really look like.

And they showed us the many ways light works with simple sensations and physical objects to bring the internet to life and make it tangible.

Like this wonderfully mechanical YouTube player.

And this was an inspiration for me.

Next, I worked with a Japanese institution, AQ, on a research project on mental health.

We wanted to create an object that could capture subjective data about mood swings that are essential for diagnosis.

This object captures your touch, so you can press it very hard if it's angry, or stroke it if it's calm.

It's like a digital emoji stick.

And you can revisit those moments later and even add some context online.

Above all, we wanted to create something intimate and beautiful that fits in your pocket and is loved.

In fact, it seems that this binoculars is a birthday present to commemorate the 40th anniversary of the Sydney Opera House.

Our friends at Tellart in Boston brought street binoculars, like those in the Empire State Building, and used Street View to get a 360-degree view of other iconic World Heritage sites (laughs).

I then pasted it under the stairs.

So they became very physical and simple reuse, or sort of a portal to other icons.

You may see the Palace of Versailles or Shackleton's Hut.

It's basically virtual reality circa 1955.

(Laughter) We use Hacky Sack for exchanging URLs in our office.

It's incredibly simple, like an Opal card.

You basically put your website on a little chip here, and you run this... wow! -- The website will be displayed on your mobile phone.

About 10 cents.

Treehugger is a project I'm working on with Grumpy Sailor and Finch here in Sydney.

And I'm so excited to see what happens if I take my phone apart and stick the pieces into a tree, and that my kids will have the chance to be guided by a magic wand to visit an enchanted forest where they'll have the chance to talk to the Digital Fairy and ask questions and be asked questions in return.

As you can see, this is in the cardboard stage.

(Laughter) But I'm very excited about the potential to put the powerful magic of the Internet at our fingertips and bring our kids back into the outdoors screen-free.

And we hope to have something like this by the end of the year.

So let's summarize.

Humans prefer natural solutions.

Humans love information.

Humans need simple tools.

These principles should form the basis of how we design for the future, not just for the Internet.

You may feel uncomfortable about the information age we are moving into.

You may feel challenged rather than just excited.

guess what? me too.

It is a truly extraordinary period in human history.

Our world is actually built by us humans, artificial intelligence does not exist...

not yet.

(Laughter) It's us, designers, architects, artists, engineers.

And I think if we challenge ourselves, we can actually create happy places filled with the information we love that feel as natural and easy as turning on a light bulb.

And while it may seem inevitable that what ordinary people want is watches, websites, and widgets, it might be worth thinking about corkscrews and light hacky bags for a second.

thank you very much.

(applause)

Interpreter: "p" in piano is my favorite musical symbol.

It means to play gently.

If you are playing an instrument and notice that there is a "p" in the sheet music, you should play it softer.

Two p's -- softer.

4 p -- very soft.

This is the p-tree I drew. This shows that perfect silence can never be reached, even with thousands of p s.

That's my current definition of silence. In other words, it sounds very ambiguous.

I would like to talk a little bit about the history of American Sign Language, ASL, and my own background.

French Sign Language was brought to America in the early 1800s, and over time it mixed with local sign languages ​​and evolved into what we know today as ASL.

In other words, it has a history of about 200 years.

I was born deaf and have been taught to believe that sound is not part of my life.

And I believed it to be true.

But now I know that was not the case at all.

Sound was part of my life and was in my head every day.

As a deaf person living in the world of sound, I live in a foreign country and blindly follow the rules, customs, behaviors and norms of that country without question.

So how can I make sense of sound?

Well, I observe how people behave and react to sounds.

You are like my speakers, amplifying the sound.

I learn and reflect on that behavior.

At the same time, I've learned that I make sounds and see how people react to me.

Thus I learned, for example...

"Don't slam the door!"

"Don't make too much noise when eating from a bag of potato chips!"

(laughs) "Don't burp. Be careful not to rub the dishes with your plate when you eat."

All this I call "sound etiquette".

Maybe I'm thinking more about acoustic etiquette than normal hearing people.

I am very cautious when it comes to sound.

And I'm always excited to see what happens next when it comes to sound.

So this figure.

Undecided, undecided.

Undecided, to be continued.

TBD, to be announced.

And you notice the staves - the lines do not contain notes.

That's because the lines already contain sound through subtle smudges and smudges.

In Deaf culture, movement is equated with sound.

This is the ASL "staff" symbol.

A typical staff contains 5 lines.

But it doesn't feel natural to me to stick my thumb out like that and sign.

That's why in my drawings I stick to four lines on paper.

In 2008 I had the opportunity to go to Berlin, Germany for an artist residency.

Until then, I was working as a painter.

This summer, I visited various museums and galleries, and as I went from one place to the next, I realized that there was no visual art.

Sound was the trend at the time, so this was shocking….

There was no visual arts, it was all auditory.

Now sound has entered my artistic realm.

Will it push me further away from art?

I realized that it doesn't have to be that way at all.

I know the sound.

I know it so well that I don't have to experience it simply through my ears.

It can be felt tactilely, experienced visually, or even as an idea.

So I decided to take back ownership of the sound and incorporate it into my artistic practice.

So I decided to throw away everything I had been taught about sound and not learn it.

I started working on a new piece.

And when I announced this to the art community, I was amazed at the amount of support and attention I received.

I realized that sound is like money, power, control, social currency.

In the back of my mind, I always felt that the sound belonged to you, to those who could hear it.

And sound is so powerful that it can either take power away from me or my artwork, or it can empower me.

I chose to empower.

There is a huge culture centered around the spoken language.

And just because I don't use my literal voice to communicate makes me look like I have no voice at all in the eyes of society.

Therefore, I need to work with people who support me equally and who are my voice.

That's how I stay relevant today.

That is why I work with a wide variety of ASL interpreters in schools, workplaces and educational institutions.

And their voice becomes my voice and my identity.

They help me be heard.

And their voices have value and currency.

Ironically, borrowing their voice allows us to maintain temporary currency, much like taking out a loan at a very high interest rate.

I feel that if I don't continue this practice, I may not be able to maintain social currency and may be forgotten.

So I explored the world of music with sound as a new art medium.

And I was amazed at the similarities between music and ASL.

For example, musical notes cannot be perfectly captured and represented on paper.

And the same applies to the concept of ASL.

They are both highly spatial and highly inflated, meaning that subtle changes can affect the overall meaning of both symbols and sounds.

To give you a better understanding of how ASL works, I would like to share the piano metaphor.

Now imagine a piano.

ASL is categorized into various grammar parameters.

If you assign different parameters to each finger when playing the piano (such as facial expressions, body movements, speed, hand shapes, etc.), English becomes a linear language as if you were pressing one key at a time.

However, ASL is more like code. To express a clear concept or idea in ASL, all 10 fingers must be down at the same time.

A change in the code of even one of those keys can result in a completely different meaning.

The same is true for pitch, timbre, and volume.

ASL allows you to express different ideas by experimenting with these different grammatical parameters.

For example, consider the sign TO-LOOK-AT.

This is the TO-LOOK-AT sign.

looking at you

I'm staring at you

(laughter) (laughter) Oh, it crashed.

(Laughter) Oh, yeah.

what are you looking at

Oh no.

(Laughter) Then I started thinking, 'What if we look at ASL through the lens of music?

If you make a symbol and repeat it over and over, it may become a piece of visual music.

For example, this is the "day" sign, where the sun rises and sets.

This is "all day".

If you repeat it and slow it down, it visually looks like music.

during the day.

I think "all night" is the same.

"All night."

This is the ALL-NIGHT shown in this diagram.

And this got me thinking about three different kinds of nights: "last night," "all night," (things) "all night."

(laughs) I feel like the third one is more musical than the other two.

(Laughter) This is how time is represented in ASL and how distance from the body can represent time change.

For example, 1H for one hand, 2H for both hands, the present tense occurs in front of the nearest body, the future in front of the body and the past behind.

So the first example is "old days".

Next, 'Past', 'Once upon a time' and finally 'Once upon a time' are my favorites for their very romantic and dramatic concepts.

(Laughter) "Common time" is a musical term that has a specific time signature of four beats per bar.

But when I see the word "common time," what automatically comes to mind for me is "at the same time."

RH: right hand, LH: focus on left hand.

I have a cane on my head and chest.

[Head: RH, Flash Claw] [Common] [Chest: LH, Flash Claw] This time, we will introduce a hand shape called "Flash Claw".

Do you mind if I follow you?

Everyone, please raise your hands.

From now on, do it both in your head and in your chest, like in "common time" or at the same time.

Yes, I understand.

It means "to fall in love" in the international [sign].

(laughter) International [Sign] is a visual tool for communicating across cultures and sign languages ​​around the world.

The second thing I want to explain is this. Please join us again.

And now this.

This is the "colonization" of ASL.

(Laughter) Third, follow me again.

and again.

This is the "enlightenment" of ASL.

So let's do these three things together.

"Falling in Love", "Colonization", "Enlightenment".

You guys have been worked hard.

(Laughter) Notice that all three signs are very similar. These all occur in the head and chest, but convey completely different meanings.

So, like music, it's amazing to see how alive and thriving ASL is.

But these days, we live in a very audio-centric world.

And just because ASL has no sound doesn't automatically hold social currency.

We need to start thinking more seriously about what defines a social currency and allow ASL to develop its own form of currency, silently.

And this could be a step towards a more inclusive society.

And perhaps people will realize that you don't have to be deaf to learn ASL and you don't have to be deaf to learn music.

ASL is such a rich treasure, and I hope everyone will have the same experience.

And listen, open your eyes, participate in our culture, and experience our visual language.

And you never know, you might fall in love with us.

(Applause.) Thank you.

Dennis Kahler-Braten: Hi, it's me.

(applause)

Every day I hear harrowing stories of people fleeing for their lives across dangerous borders and unfriendly seas.

But there is one story that keeps me awake at night. It's about Doaa.

A 19-year-old Syrian refugee, she was living a harsh life in Egypt as a day laborer.

Her father was constantly thinking about the thriving business in bomb-tossed Syria.

And the war that got them there was still raging, now in its fourth year.

And the community that once welcomed them was sick of them.

Then one day, men on motorcycles tried to kidnap her.

Once an aspiring student who only thought about the future, now he was always frightened.

But she was also hopeful. Because she was in love with the same Syrian refugee named Bassem.

Since Bassem was also suffering in Egypt, he said to Doaah, "Let's go to Europe, seek asylum and security.

I work, you study, that's the promise of a new life. ”

And he proposed marriage to her father.

But they knew that to get to Europe they would have to risk their lives, cross the Mediterranean, and dabble with smugglers notorious for their brutality.

And Doaah was afraid of water.

she always was. She never learned to swim.

In August of that year, 2,000 people had already died trying to cross the Mediterranean Sea.

So she asked her parents if she could go, and after some bitter discussion they agreed, and Mr. Bassem paid the smugglers his entire life savings -- $2,500 each.

It was Saturday morning when the call came and they were taken by bus to the beach where hundreds of people had gathered.

They were then taken in small boats to old fishing boats, which were packed with 500 people, 300 below and 200 above.

There were Syrians, Palestinians, Africans, Muslims, Christians and 100 children, including 6-year-old Sandra and 18-month-old Masa.

Families were stuffed shoulder to shoulder and foot to foot in the boat.

Doaa was sitting with her legs close to her chest, and Bassem was holding her hand.

On their second day at sea, they were sick with worry and had stomachaches from the rough sea.

On the third day, Doaa had a hunch.

And she said to Bassem, "I'm afraid we're not going to get along.

I am afraid that the ship will sink. ”

And Bassem said to her, "Wait.

We will arrive in Sweden, get married and have a future. ”

On the fourth day, passengers began to get excited.

They asked the captain, "When will you get there?"

He told them to shut up and insulted them.

"Within 16 hours we will reach the coast of Italy," he said.

They were weak and tired.

Soon they saw a boat approaching - ten men in a smaller boat, but they began shouting at them, hurling insults, throwing sticks, asking them all to disembark and board this smaller, less sea-worthy boat.

Fearing for their children, the parents refused to disembark in groups.

So the boat angrily ran away, came back half an hour later, and began deliberately ramming the side of Doaa's boat, just below where she and Bassem were sitting.

And she heard them shout, "Let the fish eat your flesh!"

And when the boat capsized and sank, they started laughing.

The 300 men below deck were doomed.

Doaa clung to the side of the sinking boat, watching in horror as a small child was torn apart by the propeller.

Bassem said to her, "Keep your hands off, or you too will be swept away and killed by the propellers."

And remember--she can't swim.

But she let go and started moving her arms and legs thinking "this is swimming".

And miraculously, Bassem found the Ring of Life.

It was one of the children's rings used for playing in pools and calm waters.

Doaa then climbed into the ring with his arms and legs dangling by his side.

Bassem was a good swimmer, so I held her hand and tread water.

There were corpses around them.

Initially about 100 survived, they began gathering in groups to pray for rescue.

However, after a day passed, no one came, and some people gave up hope. Doaa and Bassem watched in the distance as men took off their life jackets and sank into the water.

A man, Malek, approaches them with a tiny nine-month-old baby on his shoulders.

He was holding a gas canister to keep him afloat, but he said to them, "I'm afraid I won't survive.

I'm too weak I don't have the courage anymore. ”

And he handed little Marek over to Bassem and Doora, who made her sit on a life ring.

So they were Doah, Bassem, and little Marek.

Let me pause this story here and ask a question. Why would a refugee like Doaa take such a risk?

Millions of refugees are in exile and live in isolation.

They live in countries [fleeing] from a war that has been going on for four years.

I can't go back even if I want to.

Their homes, businesses, towns and cities were completely destroyed.

This is Homs, Syria, a UNESCO World Heritage City.

So people keep fleeing to neighboring countries and we are building refugee camps for them in the desert.

Hundreds of thousands of people live in camps like this, and thousands and millions more live in towns and cities.

And the communities and neighboring countries that once welcomed them with open arms are overwhelmed.

Schools, water systems and sanitation are simply lacking.

Even wealthy European countries cannot cope with such an influx without significant investment.

About 4 million people have fled across the border because of the Syrian war, but more than 7 million have fled the country.

This means that more than half of Syria's population has been displaced.

Let's go back to the neighboring countries that are hosting many people.

They feel that the world of abundance supports them too little.

And days turned into months and months into years.

A refugee's stay should be temporary.

Return to Doaa and Basem in the water.

By the second day, Bassem was very weak.

And now it was Doaah's turn to say to Bassem: “Beloved, stay hopeful for our future. We will succeed.”

And he said to her, "I'm sorry I put you in this situation.

I have never loved anyone as much as I love you. ”

And he let himself go in the water, and Doa watched his beloved drown before his eyes.

Later that day, a mother came to Doaa with her little 18-month-old daughter, Masa.

This is the little girl in the life jacket I showed you in the picture earlier.

Her older sister Sandra had just drowned and her mother knew she had to do everything in her power to save her daughter.

Then he said to Doorah, "Please take this child with you."

Let her be part of you. I won't survive ”

Then she went off and drowned.

So Doaa, a 19-year-old refugee who couldn't swim because she was afraid of water, found herself in charge of two young babies.

And since they were thirsty, hungry, and excited, she did everything in her power to entertain them, sing songs, and pass on the words of the Quran to them.

Around them the corpses were swollen and blackened.

The sun was shining during the day.

At night there was a cold moon and mist.

I was so scared.

On his fourth day in the water, Doaa probably looked like this in the ring with his two children.

On the fourth day a woman came and approached her and asked her to take another child, a little boy who was only four years old.

When Mr. Doora took a little boy and his mother drowned, the mother said to the crying child:

But soon his heart stopped and Mr. Doerr had to release the boy into the water.

Later that day, she looked up at the sky with hope. I saw two planes crossing in the sky.

And she waved her arms, hoping they would find her, but the plane soon left.

But that afternoon, as the sun was setting, she saw a merchant ship.

And she said, "God, please save me."

She waved her arms and seemed to scream for about two hours.

Then it got dark, but finally the searchlight spotted her, and when she stretched out the rope, she was surprised to see a woman holding two babies.

They hoisted them onto a boat, received oxygen and blankets, and a Greek helicopter picked them up and took them to Crete.

But Doora looked down and asked, "What happened to Marek?"

And they told her that the little baby didn't survive and she died in the boat clinic.

But Doaa was sure the little baby girl was smiling when she was pulled into the lifeboat.

Only 11 of the 500 people in the wreck survived.

There has never been an international investigation into what happened.

Several media outlets reported on the terrible tragedy of the mass murder at sea, but it was only for one day.

And the news cycle went further.

Meanwhile, at a children's hospital in Crete, young Masa was on the verge of death.

She was really dehydrated. Her kidneys were failing.

Her blood sugar was dangerously low.

The doctors did everything in their power to save them, and the Greek nurses never left her side, hugging her, hugging her, singing her words.

A colleague of mine also visited her and said nice words in Arabic.

Surprisingly, little Masa survived.

And soon the Greek press began reporting about a miracle baby who had survived four days in the water without food or drink, and offers came from all over the country to adopt her.

Meanwhile, Doaa was in another hospital in Crete, thin and dehydrated.

The Egyptian family took her into their home as soon as she was released.

And soon, rumors of Doaa's survival spread and her phone number was published on Facebook.

I started getting messages.

"Doerr, do you know what happened to my brother?

my sister? my parents? A friend of mine? Do you know if they survived? ”

One of those messages read, "I believe you saved my little niece, Masa."

And then there was this photo:

It was from Masa's uncle, a Syrian refugee who had arrived in Sweden with his family, and Masa's sister.

Masa hopes to reunite with him in Sweden soon, but until then she will be cared for in a beautiful orphanage in Athens.

And Doa? Well, rumors circulated about her survival as well.

And the media wrote about this skinny woman, but they couldn't imagine how she could have survived so far and saved yet another life in that maritime condition.

The Athenian Academy, one of Greece's most prestigious institutions, gave her the Courage Award, and she deserves the accolade and a second chance.

But she still wants to go to Sweden.

She hopes to reunite with her family there.

She wants to take her mother and father and her brothers out of Egypt as well, and I believe she will succeed.

She wants to be a lawyer or a politician or something that will help fight injustice.

She is an extraordinary survivor.

But I have to ask: what if she didn't have to take that risk?

Why did she have to go through such a thing?

Why was there no legal way for her to study in Europe?

Why didn't Masa get on the plane to Sweden?

Why couldn't Bassem find a job?

Why is there no large-scale resettlement program for Syrian refugees, victims of the worst war of our time?

In the 1970s, the world did this for the Vietnamese. why not now

Why is there so little investment in neighboring countries that host so many refugees?

And the fundamental question is, why is so little being done to stop the wars, persecution and poverty that drive so many people to the shores of Europe?

Until these issues are resolved, people will continue to go to sea in search of safety and asylum.

What happens next?

Well, it's mostly European selection.

And I understand people's concerns.

People are concerned about their security, economy and cultural changes.

But is it more important than saving lives?

Because there's something fundamental here that takes precedence over other parts, and it's about our common humanity.

A person fleeing war or persecution should not have to cross the sea and die to reach safety.

(Applause.) One thing is certain: if refugees can live where they are, they won't board dangerous ships.

And if they had enough food for themselves and their children, migrants would not make such dangerous journeys.

And if there was a legal way to emigrate, no one would hand over their life savings to the notorious smugglers.

So, on behalf of little Masa, on behalf of Doora and Bassem, and the 500 people who drowned with them, can we be sure that they did not die in vain?

Can we draw inspiration from this event to stand up for a world where every life matters?

thank you.

(applause)

I'm a professional poker player. Today I want to talk about three things that games have taught me about decision making that also apply to everyday life.

The first is about luck.

Now, like poker, life is also a game of skill and luck, and when it comes to what we care most about: health, wealth, and relationships, these outcomes depend not only on the quality of our decisions, but also on the roll of our life dice.

For example, even if we are completely health-conscious, we can still unfortunately contract diseases such as cancer.

Alternatively, you can smoke 20 cigarettes a day and live into old age, but this kind of ambiguity can make it difficult to know how good your strategy is, especially if you've experienced a lot of success.

For example, back in 2010, I won a very large poker tournament known as the European Poker Tour.

And I had only been playing full-time for about a year, so when I won, I thought I must be a pretty good player.

In fact, I thought I was so good that not only did I slack off studying the game, but I also started taking more risks and playing against the best in the world in the biggest tournaments possible.

And my profit graph went from beautiful to kind of sad, and this alarming downhill trend continued for so long that I finally realized I had overestimated my skill level and was able to correct my behavior.

And this reminds us of what we've seen in the crypto space, at least in 2017. There, the only thing that is rising faster than the market itself is the number of "senior investment professionals" that have emerged out of nowhere.

I'm not saying it's impossible to have a strategic advantage, but at the same time, it's easy to feel like a genius when you're in a market that's rising so fast that even the worst strategies are profitable.

Therefore, when we are experiencing success, it is important to ask ourselves seriously how much of that success really depends on us. Because our ego loves to downplay the luck factor when we're winning.

Now, the second thing poker has taught me is the importance of quantifying your thoughts.

You can't just think, 'Oh, they're probably bluffing' while you're playing.

Poker is a game of probability and precision, so you have to train yourself to think in numbers and you will lose a lot of money.

So now, when I find myself vaguely thinking about something really important, like "I'm unlikely to forget what I want to say in my TED talk," I try to quantify it.

(Laughter) Believe me, it's very helpful in the planning process.

And the problem is that almost anything that can happen today or in the future can also be expressed as a probability.

(Laughs) That's why I'm trying to talk about numbers now.

So if someone asks me, "Hey Liv, do you think you'll come with me to that thing tonight?"

Instead of just saying, "Well, probably," I actually tell them my best estimate, say 60 percent.

Because, while it might sound a bit strange, we actually ran a Twitter poll on how people understood the word "probably" and the response spread.

Huge!

So it seems quite useless for actually conveying real information.

If you find yourself using vague words like "maybe" or "sometimes," try using numbers instead. Because when you talk in numbers, you know what's going to reach the other person's brain.

Now, the third thing I want to touch on today is intuition.

How often have you seen this kind of inspirational meme on your Facebook feed?

[Always trust your intuition and don't guess after the fact. ] They're good, aren't they?

wonderful. yes. "Trust your soul."