question

This is why we have exhibitions

In this exhibition, 40 young artists will be presented to other generations in 8 years.

I thought deeply about what I wanted to convey implicitly

How does an artist feel about thinking as an insider about the problems that face us at the same time that our work has traveled around the world and is out in the world?

The exhibition also thought about creativity and how we nurture it in American cities.

Let's wrap up

This exhibition was, for me, a recapture of cultural discourse in an international context.

The final theme of the exhibition was "fluidity." What we had in mind was a real network of artists from all over the world.

I think we all know what the African continent means to us in the 21st century. When we look at artists and works, we think about Africa. What they say about the future, what possibilities artworks can create to include Africa in our wider dialogue.

Now, what do I discover when I look at a work of art?

What do I think about when I think of art?

The good thing about being a curator is that you can see new works and exciting works.

Not only that, but it's the joy that I can offer to discover ourselves, to hold exhibitions, to talk about beauty, about power, about who we are, with each other.

That's why I wake up every morning and think about contemporary artists.

thank you

In the spirit of Jacques Cousteau, who said, "People protect what they love." Today I want to talk to you about what I love most about the ocean.

It was this strange diving suit called Wasp that drew me to the ocean, not because Wasp is an abbreviation, but because it looks like a digger wasp.

Originally developed for use in offshore oilfields, it was a submersible tool capable of diving to depths of 600 meters.

Shortly after completing my PhD, I was fortunate enough to join a group of people who were trying to use this device for ocean exploration for the first time.

After training in a submersible at Port Hueneme, my first ocean dive was in the Santa Barbara Channel.

it was a night dive

I dived to 260 meters and turned off the lights.

The reason I turned off the lights was because I thought I would be able to see the light that living things produce, a phenomenon called bioluminescence.

I was just completely unprepared and didn't expect how much light there would be and how wonderful it would be.

I saw a string of jellyfish, the tudaceae, that were longer than this room, and they gave off so much light that I could read the memory discs and gauges in my suit without turning on the lights.

gasped

Now, if you've ever seen bioluminescence, it's probably something like fireflies.

Some insects, earthworms, and some fungi that glow on land, but in general, they're pretty rare on land.

In the ocean, bioluminescence is the norm, not the exception.

If you go out into the open sea anywhere in the world and pull up a net from 900 meters deep, in fact, in most places, the majority of the organisms caught in the net, 80 to 90 percent, will emit light.

Here you can see a wonderful light show

So I'm going to show you a short video taken from the submarine.

I started out honing my skills on the single-person submersible Deep Rover, and then I went on to do this shoot on the Johnson Sealink, which you see here.

In front of the observation dome, there's a 90-centimeter-diameter ring where you put the screen.

Inside the dome, I record with a high-sensitivity camera, which is about as sensitive as the human eye, which is used to the dark, but has the disadvantage of being a little blurry.

Now turn on the camera and turn off the lights

That crackling isn't bioluminescence, it's noise from the camera electronics.

You can't see the bioluminescence until the submersible starts moving forward underwater, when the creature hits the screen and glows on impact.

When I first did this, all I could do was count the number of flashes.

Based on the forward speed and the area of ​​the screen, we were able to calculate how many light sources per cubic meter.

Eventually, I realized that I could identify the type of organism, by the type of flash it produced.

This is the Gulf of Maine, 220 meters deep, and almost everything you see is named at the species level.

For example, large fireworks explosions come from small combed animals, including krill, other crustaceans, and even jellyfish.

Yushitsu It's a member of the animal family.

So I worked with a computer image analysis engineer to develop an automatic recognition system that could extract the type of organism and the xyz coordinates of the first impact location.

So you can do things that conservationists on land do, at very close range.

If you want to see a light show like this, you don't have to dive deep

This is what you see on the surface of the water

This video, shot by Dr. Mike Lutz of the Scripps Research Institute, shows dolphins swimming among bioluminescent plankton.

It wasn't shot in a specific location, like the bay of Puerto Rico, which is famous for its bioluminescence, but it was shot in the harbor of San Diego.

Sometimes you can even get a closer look at the ship's "head" -- a toilet in land-based parlance -- flushed with unfiltered seawater, which often contains bioluminescent plankton.

You might think that if you stumbled to the "head" of the ship late at night, seasick and dizzy, and shut yourself up in a cubicle without even a light, you'd have had a sort of religious experience.

It was a big mystery in the 19th century, when the French physiologist Raphael Dubois discussed the bioluminescence of mollusks.

He ground the mussels to extract a couple of chemicals, one of which he named luciferase, and the substrate he named luciferin, after Lucifer, the angel of light.

The terminology is fixed, but it doesn't refer to any specific compound, because these compounds are very diverse.

In fact, today, most bioluminescence researchers are looking at these chemistries, because these chemicals are incredibly valuable. They're used as antibacterial agents, as anticancer agents, as tests for life on Mars.

In 2008, the Nobel Prize in Chemistry was awarded to the work that isolated the bioluminescent green fluorescent protein, extracted from the luminescence chemistry of jellyfish, and has had an impact on par with the invention of the microscope in its impact on cell biology and genetic engineering.

These molecules also tell us something else: bioluminescence has evolved at least 40, maybe 50 times in the course of organism evolution, which suggests that the evolutionary path of bioluminescence was particularly important for the survival of organisms.

What is bioluminescence so important to so many organisms?

For organisms that hide in the dark to avoid predators, light is very useful for three things that organisms do to survive: finding food, attracting the opposite sex, and not being eaten.

For example, this fish has headlights embedded behind its eyes that can be used to find food and attract mates.

When I'm not using the light, I put it in my head, like the headlights on a Lamborghini.

This fish is equipped with high beam

This fish, my favorite, has three lamps on each side of its head.

This is a blue light. In the ocean, most of the bioluminescence is blue, and the color blue, which can reach the farthest in water, was chosen by evolution for better communication.

Most organisms emit blue light and can only perceive blue light, except for this fascinating fish, which has two red luminophores.

I don't know why there are two, but I'd like to solve this mystery someday.This fish can see not only blue light, but also red light.

Using the red bioluminescence as a sniper's telescope, you can sneak up on fish that can't see red, so they can see you without being seen.

They also have blue glowing lures in their whiskers that can attract prey from a distance.

Many organisms use bioluminescence as a lure

This fish is one of my favourites.

This is a red-spotted shorebird with a long fishing rod with a lure at the end that dangles in front of its jaw, and its sharp teeth give it its name.

This fish's teeth are so long that if you close your mouth, they'll stick in your own brain.

Instead, it slides along grooves on the outside of the head.

It's a fish that looks like a Christmas tree, and everything it wears glows, and it's not just lures.

It also has a built-in strobe light.

It has a jewel-like organ on its belly that it uses for a variety of camouflage purposes, hiding shadows as it swims around and making it invisible to predators looking up from below.

The mouth also has luminescent organs, all the scales and fins glow, and the mucus layer on the back and abdomen also glows.

Thanks to Pixar, bioluminescence has become known, and I'm grateful to Pixar for spreading the word about a topic I love to so many people.

However, if Pixar had spent a little more money and paid consulting fees to poor and starving graduate students, they would have been told that those eyes were soaked in formalin.

This is the eye of a living monkfish

Like a live mousetrap, the bait is dropped just in front of the needle-sharp teeth, and the victim is unknowingly attracted.

This lure has all sorts of interesting threads.

It was thought that different lure shapes would attract different kinds of prey, but when scientists -- or maybe graduate students -- looked inside the stomachs of these fish, they found that all species had similar diets.

So now it's believed that the different bait shapes are for males to find females, and in the anglerfish world, these males are notorious for their extremely small size.

This little fish doesn't seem to have any means of defending itself.

There is no lure to attract prey, and even if they do catch prey, they cannot eat it because they have no teeth.

The only way to live on this planet is the gigolo.Find a good person and stick with them for the rest of your life.

This little fish has found a good person, have you noticed that the clever thing is that you don't even have to look at their faces to stick together?

(Laughter) But it's obviously good for him, so I'm going to cement my relationship with her with an eternal kiss.

The male fuses with the female and lives in the female's bloodstream, thus turning the male into a mere sperm sac.

(Laughter) This is what women's ribs look like in the deep sea.

The females also know the males are there. Females don't necessarily have to be monogamous, and some females have multiple males.

This is how it's used to find food and attract the opposite sex.

It is also used extensively in many ways for defense.

Many of them can release luciferin and luciferase into water, like squid and octopus spewing ink.

This little shrimp spits light out of its mouth, like a fire-breathing dragon.Blinding or distracting the red-spotted sea bream, it can swim away into the darkness.

There are so many organisms that can do this, including jellyfish, squid, various crustaceans, even fish.

This is a red sardine, which secretes a luminous fluid from an organ near its gills.

I was very lucky to catch this, I went to study trawl nets off the northwest coast of Africa, to study deep-sea life for the "Blue Planet" project.

Special trawl nets are used to salvage these creatures alive.

Take the captured red sardine back to the lab

You can pick it up like this and touch this shoulder organ, and when you do that, it's bioluminescence.

What surprised me was not just the amount of light, but the fact that it emitted something other than enzymes and substrates.

This fish releases whole cells with nuclei and membranes.

It's a really wasteful way of doing things when it comes to energy. I have no idea why they would do that.

Another form of defense is something like a burglar bell. It's like a car's anti-theft alarm, it sounds its horn and flashes its light to get your attention, and if you're lucky, the police will come and take the thief away. If a creature is trapped by a predator, and the only hope of escape is to attract the attention of a much bigger and tougher creature, and the predator is attacked, there's a chance of escape.

For example, this jellyfish exhibits a striking bioluminescence.

We're chasing it in a submarine.

It's not luminescence, it's the gonads reflecting light.

A special device attached to the front of the submersible captures the jellyfish without damaging it and brings it back to the onboard laboratory.

And then they did something: they touched the nerve ring of the jellyfish with a sharp needle once a second.

I will not touch it anymore when it starts to emit light

It's an incredible light show

It's a windmill of light, and if you do the math, you can see this light from a predator up to 90 meters away.

I think it's a great lure

One of the frustrating things about deep-sea exploration is that you have no idea how many unknown marine organisms there are, and that's because of the way ocean exploration is done.

The basic method for studying marine life is to go out to sea and pull a net from a boat.

What other field of science relies on such centuries-old technology?

Another way is to dive in a submersible or remotely controlled device.

I have made hundreds of submersible dives

But when you're in a submarine, it's far from unobtrusive, with bright lights and clashing screw noises, and even the slightest bit of clever creatures will quickly flee.

I've been looking for other ways to explore for a long time.

Some time ago, I came across the idea of ​​a camera system.

It's not very advanced technology, but we call it the Eye of the Sea.

On land, this is what scientists have been doing for years, using light that animals can't see, and cameras that sense that light.

Infrared cannot be used underwater

We use red light, but it also has a problem: red light is quickly absorbed.

I wanted to develop a high-sensitivity camera and then make this electronic jellyfish.

In the case of scientific research, if you don't explain to the funding foundation what you're going to find, they won't give you money.

And I didn't know what I'd find

So I put together this device from scratch, and had it built as a student project at a university, and I scraped together all the money.

The lab at the Monterey Aquarium gave us time to try out the remote control, and we did some testing and figured out what kind of red light to use, so that we could see the animals, but not the animals.

I was lucky enough to make it in time, so you can even see the Ziploc logo that I used as a mold when I epoxyed the 16 LEDs.

Assembled so far with jumbles Repeated trials of trial operation to make it work

The time has finally come for everything to move together

Photographer Mark Richard captured the moment on film.

That's me on the left, and the grad student at the time was Erica Raymond, and Lee Frye was the engineer on the project.

This photo is in the honors corner of my lab, and it says, "Engineer who satisfied two women at once." We were really, really happy.

We now have a system that can be brought into a kind of oasis on the ocean floor where large predators are patrolling.

So we brought it to a salt lake on the bottom of the northern Gulf of Mexico.

It's a strange place

It's an unglamorous picture, but at the time we had terrible cameras, and this is where I lost myself.

There's a fish swimming towards a camera we set up on the edge of a saltwater lake.

don't care about us

Sink my peephole deep into the sea

For the first time, we were able to see what a creature looks like when we don't interfere.

Four hours after we'd put it on the ocean floor, we turned on our programmed electronic jellyfish for the first time.

Eighty-six seconds after the pinwheel appeared, I captured this: a squid, over 1.8 meters long, scientifically new, and not part of any known taxonomy.

No better demonstration results

When I took these results to the National Science Foundation (NSF), I explained, "This is what we're going to discover."

We've got enough research funding to develop the world's first deep-sea webcam, and it's been in the Monterey Trench for the past year. And more recently, the system has been modularized into a more mobile form, making it easier to submerge and retrieve. We're thinking of using it to help us explore and protect the "spots of hope" that Sylvia described.

I have a message for you: there's still a lot more to explore in the ocean.

In Sylvia's words, you're destroying it before you know what's there.

So if you ever get the chance to dive in a submersible, say yes a thousand times, take the opportunity and turn off the lights.

you'll love it

thank you

(applause)

good morning

It's nice to see so many of you, and everyone is smiling.

My background and my attitudes and ideas about the real world have changed quite a bit, because I'm a magician.

I prefer the term conjurer to magician, but if you're a magician, you cast spells, you cast spells, you act strangely, you actually do magic, right?

I'm not, I'm just pretending to be a real magician. (Laughter) So how do magicians do that?

It's taking advantage of the fact that audiences like you make assumptions.

For example, I come here and I take this mic from the stand and turn it on, you might think it's a mic.

No (Laughter) Actually, this is something that more than half of you are unfamiliar with.

It's an electric razor.

It's not a very good microphone. I've tried it many times. (Laughter) You have another assumption.

Given the right hints, they'll be convinced.

you think i'm watching you

no i can't see

I know you are because I was told backstage that the seats were full.

And I know it's a voice, but I can't see it without my glasses.

This is just the frame. (Laughter) No lenses.

So why is this old man standing here with glasses without lenses?

To fool you, to fool you, to prove that you believe it too.

don't forget that

Let's put real glasses on first so that we can see you properly, because that might be more convenient.

hmm not very good

(Laughter) What I do might be a little weird for a magician to do.

But hey, I'm going to take my medicine

In this bottle is a medicine called Calms Forte.

I will explain later

Ignore the instructions. Instructions are what the government puts in to confuse us.

I will take this medicine from now on

a whole bottle

Calms Forte 32 tablets

Okay, that's it. I'll explain this later. I just want to say that I'm an actor.

an actor who plays a specific role

I play sorcerers and wizards, or real wizards if you want.

If someone were to show up on this stage and say that they were Hamlet, the old Danish prince, you'd think they were making fun of you, of course.

I don't believe in such nonsense

But there are so many people out there who claim that they have psychic abilities, that they have mystical powers, that they can see the future, and that they can even talk to the dead.

And some people are in the business of astrology or some other form of divination.

They say they're willing to tell fortunes if you pay them.

And it's also said to have a perpetual motion machine.

They are psychics and have some sort of power.

Now, one of those things has been booming again lately, and it's the business of talking to the dead.

Now, the simple question is, doesn't being dead mean you can't talk? (Laughter) I think you probably agree.

But what they're saying is, not only can they talk to the dead, but they can say, "Hey, they can hear what the dead say, and they can tell the living what they hear."

Is it true

It's a lie, because these people use the same methods that we magicians use. It's exactly the same.The physical methods are the same, the psychological methods are the same.

They trick people into paying big bucks and inflicting terrible emotional pain on them.

Every year, all over the world, people pay billions of dollars to these scammers.

Now, if I get the chance, there are two things I'd like to ask them.

First, if you want the dead to be summoned, they're like this

I listen, I ask you to call my grandmother.

She says, "I'm in heaven right now, it's so beautiful"

"I'm with all my childhood friends and friends who passed away." "And my family."

"I love you I will always be by your side"

"See ya"

But you didn't answer the most important question

where is the will

It would be nice if you answered simply, "On the second shelf in the study, behind the encyclopedia." But I would never say that.

Doesn't give me any useful information

I paid a lot of money to ask this question, and I'm not getting an answer.

The other question is, it's easier, but let's say you want to talk to your late father-in-law.

They keep asking me in my ear, "Does my name start with J or M?"

Is this a game to find the answer

what are you looking for

20 questions, maybe 120 questions.

But what they're playing is really cruel and vicious... Oh, I'm fine, sit down. (Laughter) It's a totally shameless game.

And they're taking advantage of unsuspecting, ignorant people who are grieving and in need of help.

Now what they're doing is called cold reading.

There's this guy, his name is James Van Praag.

he's a tycoon in this industry

So do people like John Edward, Sylvia Brown, Rosemary Althea.

There are hundreds of these people all over the world, but in this country, James Van Praag is a big deal.

What do you think he's doing He's telling the story of how the deceased died Hearing voices through his ears

And what he usually says is something like, "Before he died, he said," "He couldn't breathe."

That's what it means to die

(Laughter) If you stop breathing, you're dead.

it's really simple

do you want that kind of information?

it's not

Well they go on like this "electricity yes"

"He says electricity." "Was the deceased an electrician?"

"Did you have an electric razor?" "No."

It's like this guessing game

this is how they do it

At the James Randy Educational Foundation, I got a call asking why this is such a big deal and is it just a game?

I often receive

This is not a game, it's a cruel farce

It might provide some comfort, but that feeling of relief only lasts for about 20 minutes.

And people look in the mirror and say, pay a lot of money for this seance

All I heard was I love you, they all say the same thing

I haven't gotten a single piece of meaningful information, and I haven't gotten anything worth paying for.

Sylvia Brown is a famous fortune teller.

we call her vulture

Thank you, Sylvia Brown is a big name in the current world of divination.

Sylvia Brown, for example, charges $700 for a 20-minute phone reading.

The customer pays with a credit card or something, and then sometime within two years, you get a call.

"Hello, I'm Sylvia Brown."

You'll know who it is right away

Well, Montell Williams is a smart guy.

he is famous on tv

He's educated, he's smart, he knows how to do Sylvia Brown, but I don't care.

I don't mind

Because the sponsors love it, and they're always openly promoting her on TV.

What would Sylvia Brown do for $700?

First, it will tell you the name of the person's guardian angel.

This is essential, isn't it? (Laughter) And it will tell you what your name was in your previous life, who you were before.

That's right

According to her fortune-telling, the customer was a Babylonian princess or something.

All the men were Greek warriors who fought alongside Agamemnon.

I would never say a 14-year-old boy who died of tuberculosis while shining shoes in the streets of London.

Clearly a boy like that isn't worth bringing up.

And as you've probably noticed, strangely enough

When these people are on TV, they never call anyone out of Hell. (Laughter) They're from Heaven, they're not from Hell.

If I were to summon any of my friends, it wouldn't be heaven...you know what I mean?

(Laughter) Well, Sylvia Brown is kind of an exception.

easy to win

You just have to prove something paranormal, occult, or some kind of supernatural phenomenon or ability under the right conditions.

It's so easy to get a million dollars

Sylvia Brown is an exception because she was the only professional psychic in the world to take up the challenge.

I said that on CNN's Larry King Live six and a half years ago.

I haven't heard from her since. That's strange.

she first said she didn't know how to contact

no way

You can talk to the dead, but you can't reach me.

(Laughter) I'm alive.

well ok

You said you couldn't contact me, but now you say you don't want to contact me because I'm disrespectful.

Then you should win more and more million dollars

Seriously, people like that need to stop

because that's a cruel farce

People keep coming to the Foundation

I was hurt financially and emotionally, so I trusted them and paid for them.

Well, I took a pill earlier, didn't I?

let's talk about that

homeopathy what is that

I'm sure you've heard

It's a form of alternative medicine.

That pill is also homeopathic

It's called Calms Forte, forgot to mention 32 sleeping pills.

I drank it, six and a half days of sleeping pills.

(Laughter) Six and a half days is a lethal dose.

Here's what's on the back of this box: If you overdose, call your doctor right away, and a toll-free number.

Please sit down I'm fine

You don't have to, because I've been doing this experiment in front of audiences all over the world for eight or 10 years, taking lethal doses of homeopathic sleeping pills.

why does nothing work

(Laughter) (Applause) You'll be surprised when I tell you.

what is homeopathy

This uses a drug that really works, but dilutes it down to even lower than Avogadro's constant.

(Laughter) Now, this is not a metaphor, it's the truth.

It's kind of like throwing a single 325-milligram aspirin tablet into the middle of Lake Tahoe, stirring it with a really long stick, and waiting a couple of years or so for the solution to become homogenous.

So when I had a headache, I drank this water and, voila, it healed.

(Laughter) That's what homeopathy is about.

Also, interestingly, they said that the more you dilute the drug, the more potent it becomes.

Speaking of which, the poor guy in Florida

I was taking homeopathic medicine

Death due to overdose

It is believed that the medicine was only forgotten

(Laughter) Think about it.

it's really funny

What were you thinking, believing this shit for so many years?

Now, look, the James Randy Education Foundation has a very big giveaway, and no one is willing to accept it, but that doesn't mean those forces don't exist.

may exist somewhere

Perhaps those people are rich enough

Well, so does Sylvia Brown.

$700 for a 20 minute consultation over the phone, lawyers don't make that much.

I mean, that's a lot of money.

Those people probably don't want the million dollar prize, but don't you think they'd accept the challenge just to make fun of me?

As Sylvia Brown used to say, to get rid of this irreverent man.

something has to be done

Please let me know if there is any way I can reach out to the United States, state and local governments and get them to do something about it.

if you know that oh yeah

Even today, there are people speaking out about the AIDS epidemic, starving children around the world, people with dirty water to drink.

That's very important, it's extremely important

something has to be done about those problems

But at the same time, as Arthur C. Clarke said, I think we have to do something about the rot in the human mind, the medieval way of thinking that believes in the paranormal, the occult, the mystical, all that nonsense.

Most of the responsibility for this lies with the media.

They promote all sorts of shit like that because it pleases their sponsors.

because it is a way of income

Only income matters

really have to do something about this

If you have any suggestions, please go to the Foundation's webpage.

It's www.randi.org

Go there, look at the archives, and you'll have a better idea of ​​what I'm talking about today.

There are documents in the Foundation's possession.

It's terrible to hear that you're in that library when a family comes in and tells you that your mom's property has been taken.

They pawned CDs and donated shares and deeds.

It's a really sad story.

If you don't really think about these things, you're going to mess up the minds of Americans, the minds of people all over the world.

The Foundation has provided this carrot, hanging on the bait.

waiting for someone to bite into it

Yes, there are many. Hundreds of them show up every year.

Fortune tellers, people who claim to be able to talk to the dead, but they're amateurs and don't know how to assess their abilities.

Professionals never go near the Foundation, except Sylvia Brown, who I just told you about.

she accepted the challenge and withdrew

Hi everyone, my name is James Randy and I'm waiting.

that's all

(applause)

The greatest irony in global health is that the poorest countries carry the heaviest burden of disease.

If you scale the size of the world's countries relative to the size of the challenge, you find that sub-Saharan Africa is the region most affected by AIDS.

AIDS is the most serious infectious disease today

We can also see that this region is the region with the least capacity to deal with AIDS.

There are very few doctors, and frankly, these countries don't have the resources they need to deal with an epidemic like this.

So the developed countries of the West have been generous enough to offer free medicines to people in third world countries who can't afford them.

This has already saved millions of lives and prevented the collapse of the entire economy of sub-Saharan Africa.

But there's a fundamental problem: this policy will undermine efforts to fight this disease. If you continue to administer drugs to undiagnosed people, you'll eventually develop drug-resistant viruses.

It's already happening in sub-Saharan Africa.

The problem is that what started out as a Third World tragedy can easily become a global problem.

The last thing we want to do is have a drug-resistant virus break out all over the world, which will make treatment more expensive, and we may once again see AIDS kill as many as it did before anti-HIV drugs became available.

I experienced this myself when I was in high school in Uganda.

In the 1990s, the spread of HIV was at its peak, and there were no anti-HIV drugs in sub-Saharan Africa at the time.

Around that time, I lost many relatives and teachers of mine to AIDS.

This is what fueled my passion to find real solutions to these problems.

Everyone knows about the miracle of miniaturization.

Computers used to be big enough to fill this entire hall, and people were working inside computers.

But the miniaturization of electronics has allowed us to pack technology into mobile phones.

All of the cellphones you have will probably work in the far corners of the globe, in third world countries.

The good news is that the same technology that miniaturizes electronics can be used to miniaturize biological laboratories.

Now, we can actually make biology and chemistry laboratories small enough to fit on a microfluidic chip.

I was lucky enough to come to the United States right out of high school to study this technology and develop some of the devices.

This is my microfluidic chip.

So let me show you what the technology is. This is a circuit the size of a human hair. It's got valves, it's pumps, it's mixers, it's injectors.

What we're trying to do with this technology is to use the technology we have today to create an HIV diagnostic kit in a microfluidic system.

A single microfluidic chip the size of an iPhone can diagnose 100 patients simultaneously.

We will be able to do up to 100 viral load tests for each patient.

And it only takes four hours, 50 times faster than today's state-of-the-art technology, and at 1/5 to 500 times the cost.

This will bring personalized medicine to the Third World at an affordable price, making the world a safer place.

In order to push forward this concept and lead it to practical application, I would like everyone to be interested and participate.

thank you very much

(applause)

A few years ago at TED, Peter Skillman introduced me to a design challenge called the Marshmallow Challenge.

The rules are very simple: a team of four people builds a self-supporting structure as tall as possible out of 20 spaghetti sticks, 90 centimeters of tape and string, and marshmallows.

You have to put the marshmallow on top

It sounds easy, but it's actually quite difficult, because you have to work quickly with people on your team.

I thought this was interesting, so I incorporated it into my design course.

it was a great success

Since then, we've done it about 70 times around the world, with students, designers, architects, and even CTOs of Fortune 50 companies.

Most people usually start by checking the issue

We talk about the problem, think about how it should be, and fight for leadership.

After that, I spend some time planning and preparing, sketching and deciding where to place the spaghetti.

Most of your time is spent assembling spaghetti to make structures taller.

At the end of the hour, it's finally time for someone to take out the marshmallow, carefully place it on top, and then step back and say, "Wow!"

But a lot of the time, the reality is that 'yay' turns into 'ahhh', because the weight of the marshmallows crushes the whole structure down.

Some people tend to be more 'ahhh' than others, and the worst is new business school grads.

(Laughter) Lies, cheats, distractions and builds really bad structures.

Of course, there are groups that often end up with a "good job," and the best are the new kindergarten graduates.

(Laughter) It's really amazing.

As Peter puts it, kindergarteners build not only the tallest, but the most interesting structures.

You're probably wondering why? What makes it so?

Peter says, "Kids aren't trying to be president of Spaghetti Corporation." Exactly.

Don't waste your time fighting for power

but there's another reason

Business school students are trained to find one plan that works.

and carry out according to plan

By the time they put the marshmallows on top, time is running out, and what happens?

It's a crisis

Sounds like something you've heard before, doesn't it?

What's different about the kindergarten kids is that they start with the marshmallow, and they always put the marshmallow on top, and they build one prototype after another, so they can revise the bad prototypes over and over again.

If you're a designer, you'll realize that such work is the essence of an iterative process.

I get feedback every time I make it, and I can immediately see what works and what doesn't.

The ability to prototype is really important. Let's look at how different types of teams perform.

The overall average is about 50 centimeters. Business school students are about half that. Lawyers are better, but below average. Kindergarteners do better than most adults.

Who did the best?

I'm an architect and an engineer.

(Laughter) 99 centimeters is the highest I've seen.

why? Because they know that triangles and self-reinforcing geometries are key to building stable structures.

CEOs are doing a little better than average, but it's interesting.

Having an administrator on the team significantly improves their performance.

(Laughs) When I looked around the whole thing,

I know before the end why?

Because the people in charge have a special skill called facilitation.

they understand and manage the process

Any team can greatly improve its performance by carefully monitoring and managing its work.

Specialty skills and facilitation skills, and the combination, can lead to great success.

If you have 10 teams, which is normal, maybe 6 teams will build a standing structure.

So I tried something interesting

I was thinking of raising the stake

I decided to give the winning team $10,000 worth of software.

What do you think happened to the design students?

what was the result?

This is what happened: we couldn't have a structure that stood as a team.

If I had made something that would stand, even if it was just three centimeters, I would have been able to bring home a prize.

It's interesting that the presence of big prizes can have a tremendous impact.

Four months later, I had the same students do the exercise again.

What do you think happened this time?

They understand the importance of prototyping

We went from being the worst team to being one of the top performers.

Built the tallest structure in the least amount of time

There's an important lesson here about motivation and the nature of success.

You might be wondering why I'm doing something like the Marshmallow Challenge.

The reason is that my job is to create digital tools and processes to help the creators of cars, games and visual effects.

And the Marshmallow Challenge helps them discover hidden assumptions.

Because, really, every project has its own marshmallow.

Through this challenge, a common experience, a common language, a common attitude is built for proper prototyping.

That's the value of this really simple exercise.

Interested parties can visit marshmallowchallenge.com

You can see how to build marshmallow structures

Contains instructions for doing the Marshmallow Challenge

We're seeing crazy examples of ingenuity from people all over the world.

There is also a world record for the marshmallow challenge

The fundamental lesson is that design is really a contact sport.

You are required to put all your senses into the task, and you must apply your best thoughts and feelings and actions to face the challenges at hand.

Sometimes a little prototyping can turn an "ahhh" into a "yay!"

and it can make a big difference

thank you very much

(applause)

I think one of the hallmarks of being a TED fellow is turning your passion into a responsibility.

TED Fellows take real action on issues they care about.

But in the end, it may be necessary to move politicians.

How can we do that?

One thing I can tell you is that I used to work for the Discovery Channel, so that may have affected my perspective.

When you think of politicians, you have to understand that they are strange creatures.

Aside from their inability to point you in the right direction and their bizarre breeding habits, how do you work with them? We need to understand what drives political creatures.

There are two main things that occupy the minds of politicians. The first is reputation and influence.

This is the main tool politicians use to get their jobs done.

Second, unlike most animals trying to preserve their species, politicians try to preserve themselves.

You might think that politics is money, but money is just another way of self-preservation.

The difficulty in overcoming the problem is that politicians continue to receive demands from those around them all year long.

So there are less effective ways to get issues addressed.

You can also send an e-mail

Unfortunately I get so many Viagra ads that your emails will get buried.

Spam disables it.

What about trying to make a phone call?

Maybe an incompetent phone number picks up and just tells you. “He called me and said he didn’t like it.”

This will not progress the problem.

Of course it's effective to talk directly It's going to be difficult to set up the opportunity.

It's hard to set the context and actually move the conversation forward.

Of course donations help. You can have context for the conversation, but it takes time to get there.

So the real question is, what is better?

Although the answer may be a bit strange

It's a letter.

Even though we live in a digital world, we are very analog creatures.

A letter really works.

Even the president takes time each day to read ten letters selected by his staff.

Every politician I know will tell you about the letter they received and what it meant to them.

How should I write the letter?

The first is to use an analog instrument, the pen.

It's hard, and you may struggle to hold the pen well, but it's really important.

Writing a handwritten letter is really important.

The idea of ​​someone using an analog device to write a letter and send it to you is a novelty.

Second, I encourage you to take a proactive stance and write to your legislators at least once a month.

I can assure you that if you keep doing this, in less than three months, your legislators will call you and ask you when it started and what you think about it.

So let me teach you the four-paragraph format you should use in your letter.

You should understand that there are dangers when you approach these animals. It has to be approached with a certain amount of respect and a little caution.

The first paragraph should be simple. Show gratitude.

You may not be particularly grateful to them, but you can appreciate their hard work.

Animals do when they do.

Don't waste your time playing.

Hence this. The second paragraph is to get straight to the point and say what you think.

At this time Try to criticize the way instead of criticizing people.

Personal attacks do nothing.

In the third paragraph, when animals are attacked and cornered, they will fight for their lives. you need to keep an escape route open

If there is an exit strategy, they usually use it.

because everyone is intelligent

If I had the right information, I'm sure I would have done the right thing. Finally, be a nurturing being.

Be a safe haven.

In the fourth paragraph write: "If you don't have anyone to pass this information on to, let me help you."

A letter signature has the same effect.

I'm sure you're doing a lot of things, like being the vice president of a company, or being a volunteer.

why is that important?

Because it fits two main criteria of political creatures. You have influence over a wide range of people, and the position of politicians depends on you.

Here's another tip, especially useful for federal employees.

About how to send a letter.

Send the original letter to the district office first.

Send a copy to headquarters.

If they followed the procedure, they would call and ask, "Do you have the originals over there?"

Then the clerical person wrote down his name on a sticky note and thought, "Oh, this is an important letter."

I'll probably put that letter in a folder of papers for the legislators to look at.

what does the letter mean? We are all at a party, and politicians are Kusudama dolls, so to speak.

(Laughter) Politicians are touted, lectured, pitched, marketed, but the truth is that letters are one of the few ways we can communicate directly.

I got this letter when I was first elected, and I still carry it with me every time I go to Congress.

Letters are an opportunity for real dialogue. Letter dialogue is very powerful if you are in charge of something and want to communicate.

With the power of handwritten letters, you can become like a 300kg gorilla in the forest.

Please write me a letter.

(applause)

I've kept a low profile all my professional life, and standing in front of an audience is a combination of an out-of-body experience and a deer in the headlights.

I'll start with the idea that made me want to become a documentary photographer.

I spent the 1960s as a student, a time of social upheaval and exploration, and on a personal level, I felt an awakening of idealism.

The Vietnam War was raging, the civil rights movement was happening, and photography had a strong impact on me.

Photographers were saying the exact opposite of what politicians and military men were saying.

Like many Americans, I put my trust in the photographer.

Photography empowered resistance to war and racism

Photographs not only documented history, they changed the course of history.

As photography became part of our collective consciousness, and as that consciousness evolved into a common conscience, change went from possible to inevitable.

I have found that the free flow of information, represented by visual journalism among others, can focus on both the benefits and costs of policy.

It gave credibility to decisions and boosted success

It's a kind of intervention, in the face of thoughtless political decisions and political failures, that counts the damage and encourages us to reconsider our own actions.

It puts a human face on problems that, from afar, seem abstract, ideological, or monumental in their impact on the world as a whole.

What happens at the ground level, far from the center of power, is happening to every ordinary citizen.

And I've found that documentary photography has the power to reinterpret things from the point of view of ordinary citizens.

It gives voice to those who otherwise have no voice.

In response, it can stimulate public opinion and energize public debate, so that only interested parties cannot lead the debate as much as they would like.

Having lived through these times, I have come to realize that the free flow of information is essential to the functioning of a free and vibrant society.

Publishing is still a business, and business success is essential to survival, but you have to find the right balance between commercial consideration and reporting responsibility.

Social problems cannot be solved unless they are discovered

From a higher point of view, publishing is a service industry, and that service provides an awakening.

Not every story has to sell something

sometimes it is necessary to serve

I wanted to follow that tradition

Discovering the enormous impact war has on everyone involved, and how visual journalism can be a factor in ending conflicts, made me want to be a war photographer.

But what drives me is the feeling that any photograph that exposes the truth of war is, by its own definition, an anti-war photograph.

I will now take you on a visual journey through the events and phenomena that I have been involved with for the past 25 years.

In 1981 I went to Northern Ireland

Ten IRA (Irish Republican Army) prisoners were on a hunger strike that led to their deaths in protest at their prison treatment.

The reaction in the streets turned into a violent confrontation

I learned that the front lines of modern warfare are not on isolated battlefields, but on the very places where citizens live.

In the early '80s, I spent a lot of time in Central America, which was engulfed in a civil war that was driven by Cold War ideology.

In Guatemala, the ruling European oligarchy waged a scorched-earth tactic against local rebels that seemed to reflect an image of Latin American history: conquest by the Bible and the sword.

An anti-Sandinista guerrilla soldier who was fatally wounded during Commander Zero's attack on a town in southern Nicaragua.

The wreckage of a tank belonging to the National Guard of Somoza stands as a monument in a park in Managua, and the vigor of children has changed its meaning.

At the same time, there was a civil war going on in El Salvador, and here again civilians were involved in the fighting.

Since 1981, I have covered the Palestinian-Israeli conflict.

Back in 2000, the Second Uprising had just started, and stone throwing and Molotov flame grenades were still the only way to counter the military.

In 2001, the riots escalated into armed conflict, one of the major incidents of which was the destruction of a Palestinian refugee camp in the West Bank town of Jenin.

Unable to find a landing point in the political arena, the friction caused by the exchange of tactics has created nothing but suspicion, hatred, and revenge, and the chain of violence continues.

In the 1990s, after the collapse of the Soviet Union, Yugoslavia was divided into ethnic groups and civil wars broke out in Bosnia, Croatia and Serbia.

This is a house-to-house battle scene in Mostar, where neighbors are fighting each other.

The bedroom, a place where people share intimacy and nurture life, has become a battlefield.

A mosque in northern Bosnia was destroyed by Serbian artillery and used as a makeshift morgue.

After the battle, the corpses of Serb soldiers were collected and used to replace prisoners and Bosnian soldiers who died in battle.

This used to be a park

The Bosnian soldier who guided me told me that all his friends were there now.

Meanwhile, in South Africa, after Nelson Mandela was released from prison, black forces were entering the final stages of liberation from apartheid.

One of the things I had to learn as a journalist was how to handle my anger.

I had to turn it into energy and clear my eyes instead of clouding them.

At Transkai, I witnessed a Xhosa coming-of-age ceremony

A teenager lives alone, his body is covered with white clay

After a few weeks, they wash off the clay and become men on their own.

It was a very old ceremony, but it seemed to symbolize the changing political struggles in South Africa.

A boy in Soweto is playing on a trampoline

Hunger was happening everywhere else in Africa.

In Somalia, the regime collapsed and tribal conflicts erupted

Farmers were displaced, crops and livestock destroyed or stolen.

Hunger was used as a weapon of mass destruction - primitive yet extremely effective.

Hundreds of thousands died slowly and painfully

The international community provided enormous humanitarian aid, saving hundreds of thousands of lives.

American troops were sent to defend the evacuation boats, but were eventually embroiled in conflict and withdrew after the tragic Battle of Mogadishu (Blackhawk Down).

In South Sudan, similar starvation tactics were used to massacre during the civil war.

Once again, international NGOs under the protection of the United Nations launched a massive rescue operation, saving thousands of lives.

I am a witness and want my testimony to be honest and uncensored

I also want to be strong and eloquent in doing as much justice as possible for the experiences of the people I photograph.

This man is in an NGO's food center, and he's getting the most support possible.

He's got nothing really, he's like a living skeleton Yet he musters up the courage to move

He hasn't given up, and if someone like him doesn't give up, who in the outside world would give up?

In 1994, when I covered the South African elections and saw Nelson Mandela become president, that was the most exciting thing I've ever done.

It was a demonstration of the best side of human nature.

The next day I left for Rwanda and it was like going to hell in a super express elevator.

This man has just been released from a Hutu death camp

He let me take pictures for a very long time, and even turned his face to the light, as if to ask me to take a closer look.

I think he knew what the scars on his face would tell the world.

At this time, the international community remained silent, either confused or daunted by the military tragedy in Somalia, and about 800,000 people were murdered by agricultural implements from their own countries, sometimes by their neighbors.

Perhaps learning from its timid reaction in Bosnia and its failure in Rwanda, when Serbia attacked Kosovo, the international response was even more decisive.

NATO forces invade, Serbian forces withdraw

The Albanians were murdered, their farms were destroyed, and vast numbers were deported.

They were received by refugee camps in Albania and Macedonia.

This is the burned mark of a man who was burned at home

This photo reminds me of cave paintings, whispering that in many ways we are still primitive.

Between 1995 and 1996, I covered the first two wars of the Chechen conflict from inside Grozny.

This is the Chechen rebel front against the Russian army

For weeks on end, the Russians continued to bomb Grozny, killing mostly civilians trapped inside the city.

I found a boy from the local orphanage wandering the front lines.

My work has evolved from being primarily about the battlefield to critical social issues.

After Ceaușescu's downfall, I entered Romania and discovered a children's concentration camp, where orphans were kept in medievally squalid conditions.

Ceausescu imposed a quota on the number of children each family could produce, and made the female body an instrument of economic policy.

Children who could not support their families were raised in government orphanages.

Children with birth defects were considered incurable and confined to inhuman conditions for the rest of their lives.

International aid stepped in again as reports surfaced

I spent months delving deep into the remains of the political system of Eastern Europe, telling stories about the effects of industrial pollution, where no consideration was given to the environment or the health of workers or the general public.

An aluminum factory in Czechoslovakia was full of carcinogenic smoke and dust, and four out of five workers had cancer.

After the fall of the Suharto government in Indonesia, I started looking at the state of poverty in modernizing countries.

I spent a long time with a man who lived with his family on a railroad embankment and lost an arm and a leg in a railroad accident.

Once the story was published, voluntary donations were sent in large numbers.

A trust fund was set up, and the family now lives in a house in the suburbs and has all their necessities covered.

The story was not for commercial purposes.

Journalism paved the way for people's natural generosity, and readers responded.

I met a group of homeless boys who came to Jakarta from the countryside and ended up living in a train station.

By age 12-14 they were already beggars and drug addicts.

The suburban poor become the urban poor, and in the process, they become invisible.

The people in Pakistan's de-heroin addiction facility remind me of characters in Beckett's play: Isolated, waiting for darkness and drawn back into the light.

Agent Orange was a defoliant used during the Vietnam War to prevent the Viet Cong and North Vietnamese forces from hiding in the forest.

The ingredient is dioxin, a highly toxic chemical that is sprayed in huge quantities, and its medicinal effects are inherited and affect the next generation.

In 2000, I started documenting global health problems, concentrating first on AIDS in Africa.

I tried to tell the story through my work on the nursing side.

Whether international NGOs or local grassroots organizations, we thought it important to let them know they were helping patients.

Too many children are orphaned by epidemics, and grandmothers take the place of their parents in their care, and many of those children are born with HIV.

hospital in zambia

I started reporting on the strong link between HIV/AIDS and tuberculosis.

This is Cambodia's Médecins Sans Frontières (MSF) hospital.

My photos can help NGOs by highlighting the critical social issues they deal with.

I traveled with MSF to Congo to contribute a book and an exhibition to bring attention to a war that kills millions and is weaponized by exposing people to diseases for which there is no cure.

A child undergoing an anthropometric measurement as part of a nutritional supplementation program.

Autumn 2004 I went to Darfur

This time I was dispatched by a magazine company, but I worked with MSF again.

The international community had not created the necessary pressure to stop the genocide.

An MSF hospital in a camp for displaced people.

I have been working on crime and penalties in America for many years.

This is a scene in New Orleans

In Alabama, a chained prisoner is handcuffed to a pole in the midday sun for punishment.

This experience raised a lot of questions, some of which were about race and equality, and they should have opportunities and choices in this country.

A chained prisoner in Alabama.

I didn't see the moment either plane crashed. When I looked up the window, the first tower was on fire. I thought maybe there was an accident.

A few minutes later, when I looked up again, I could see the second tower on fire, and I knew we were on the battlefield.

In the midst of the rubble of Ground Zero, I understood

Since 1981, I have been photographing Islamic societies not only in the Middle East but also in Africa, Asia and Europe.

When I was photographing these different places, I thought they were separate stories, but on September 11th, history crystallized and I realized that I had actually been covering the same story for 20 years, and the New York raids were the latest manifestation.

A post-war photo of the commercial district of Kabul, Afghanistan, just before the town fell to the Taliban.

A landmine victim receives care at a Red Cross rehabilitation center run by Alberto Cairo.

A boy who lost his leg due to a remaining landmine.

I have witnessed the terrible suffering of Islamic societies, due to political oppression, civil war, foreign invasion, poverty and hunger.

I believe that Islamic society is screaming in its agony.Why don't we listen?

A Taliban soldier shot during the Northern Alliance invasion of the town of Kunduz.

When the war with Iraq was imminent, I felt that the American military would be very well covered, so I decided to cover the invasion from inside Baghdad.

Several members of one family were killed in a market mortar attack.

A day after the U.S. Army marches on Baghdad, Marines arrest a bank robbery and are celebrated by the crowd - a hopeful time that didn't last long.

For the first time in many years, Shiites were allowed to make pilgrimages to Karbala to perform Ashura ceremonies.

A group of men cut themselves with knives and march down the street

It was clear that the Shiites were a force to be reckoned with and that we should understand them and learn how to deal with them.

Last year, I spent several months documenting an American soldier wounded on the battlefield in Iraq and returning home.

This is an army doctor giving cardiopulmonary resuscitation to a soldier who was shot in the head by a helicopter.

Military medicine has become so efficient that the percentage of soldiers who survive their injuries is higher than in any previous war.

The symbolic weapon of war is the improvised bomb The symbolic injury of war is a severe leg injury

After enduring tremendous pain and trauma, the injured face extreme physical and mental struggles in rehab facilities.

Their mental strength is just amazing

When I imagine myself in that position, I am humbled by the courage and determination they display in the face of such a devastating loss.

Good people put in the worst possible situation for questionable results.

One day in rehab, someone started talking about surfing, and they'd never surfed before and they said, "Hey, let's go."

and they went surfing

Photographers go to extreme human experiences to show people what's going on there.

Sometimes even risking their lives because they think your opinion matters, your influence.

In the photographs they take, they appeal to your best instincts, your tolerance, your sense of right and wrong, your ability and willingness to share with others, your power to reject the unacceptable.

Here's my TED wish: I have important stories to tell, and I want TED to help me get to them and to develop innovative and inspiring ways to use news photography in the digital age.

Thank you very much

(applause)

Like every passionate software engineer out there, I follow Silicon Valley tech companies, like a European soccer fan following their favorite team.

I read articles on tech blogs, and I listen to podcasts on my phone.

But after reading the article, locking my phone and unplugging my earbuds, I'm back in sub-Saharan Africa, and things are very different here.

Frequent, long blackouts, low computer penetration, slow internet speeds, understaffed hospitals, large numbers of patients, etc.

Since the HIV epidemic, hospitals have struggled to manage routine HIV medical records as patient numbers have increased.

In such an environment, technology mechanisms developed elsewhere won't help. But in 2006, I joined Baobab Health, a team of community-based engineers who deliver appropriate medical interventions to address the challenges of Malawi's healthcare system.

We've developed an electronic medical record system that healthcare professionals use to see patients.

Halfway through development, we realized that we needed not only to develop software, but also to build infrastructure.

Because we don't have enough medical staff to comprehensively examine every patient, we built clinical guidelines into the software to guide the nurses and clerks who assist in the care.

Everyone has a birthday, but not everyone knows their birthday, so we created an algorithm to treat the estimated birthday as the de facto birthday.

How are we going to follow up on patients who live in slums with no street numbers or house numbers?

We used striking structures to deduce their actual addresses.

In Malawi, we don't have identification cards to identify patients, so we needed an identification feature to share patient records between clinics.

The identification is printed with a barcode and attached to the patient's personal health record book.

This barcode ID allows quick retrieval of patient records by simply holding it up to a barcode reader.

You no longer have to fill out your personal information on a paper roll every time you visit the hospital.

The queue shortened in no time

What this means is that patients, especially mothers with young children on their backs, don't have to wait long to get assistance.

Even if you lose your notebook, you can retrieve the record just by searching for the name.

Names are pronounced and spelled differently

People often confuse R and L, and they often confuse English and native language names.

Even the Soundex algorithm, which classifies words by their pronunciation similarity, didn't help.

So we had to modify it to connect and match existing records.

Before the iPhone came out, software engineers were building for personal computers, but we knew from our own experience that the power supply was unreliable for personal computers.

So we took a touchscreen retail terminal and turned it into a hospital workstation.

At the same time, they also introduced Internet appliances called i-Openers, manufactured by a now-defunct dot-com-era American company.

We modified the screen to include a touch sensor and power it from a rechargeable battery.

In the beginning, we didn't have a reliable network environment to send data, especially in rural hospitals.

So we built our own radio towers, built a wireless network, and connected it to a clinic in Lilongwe, the capital of Malawi.

(Applause) I've watched teams of engineers and medical personnel working in hospitals use the system and build it over and over again, and now all the major public hospitals in Malawi use it to manage their HIV medical records.

Each clinic serves more than 2,000 people with HIV.

Nurses who used to spend days recording and preparing quarterly reports are now producing the same report in minutes, and medical professionals from all over the world come to Malawi to learn how we've done it.

(Applause) It's great and fun to follow technology trends around the world, but in order to do that in a resource-poor environment like a public hospital in sub-Saharan Africa, I had to be a jack of all trades and build the entire system from scratch, including the infrastructure.

Thank you for your attention

(applause)

In March 2017, the Mayor of Cape Town officially declared a local state of emergency as there were less than four months of usable water remaining.

Residents were limited to 100 liters of water per person per day.

What does this actually mean?

You can shower for five minutes with 100 liters of water a day, wash your face twice, and probably flush the toilet about five times.

But you can't brush your teeth, you can't wash your clothes, and of course you can't water your plants.

Unfortunately, you can't even wash your hands after flushing the toilet five times.

I can't even sip water

The mayor said this meant a new relationship with water.

Today, seven months later, I would like to introduce two things about this second home for me.

First, Cape Town's water hasn't run out yet.

But as of September 3rd, the 100 liter limit has been lowered to 87 liters.

The mayor explained that chronic water shortages are the city's new normal.

Second, what's happening in Cape Town is going to happen in many other cities and countries around the world.

According to the Food and Agriculture Organization of the United Nations, less than 5 percent of the world's population lives in countries with more water than they did 20 years ago, excluding those with no data.

Everyone else lives in a country with less water than before.

And almost one in three people live in countries facing water shortage crises.

I grew up in Jordan, a country that has experienced absolute water scarcity since 1973.

Even in 2017, only 10 countries in the world have less water than Jordan.

Dealing with water scarcity is ingrained in my soul.

As soon as I was old enough to learn how to write my name, I also learned that I needed to save water.

My parents always told my siblings and me to turn off the faucet when brushing our teeth.

When I played with balloons, I used flour instead of water.

it's really just as fun

(Laughter) A few years ago, when my friend and I did the Ice Bucket Challenge, we used sand.

(Laughter) Sand isn't ice water, so you might think it's no big deal.

In fact, you're covered in sand all over your body, and it takes a long time to shake off.

But what I didn't realize when I was playing with flour-filled balloons as a kid, or throwing sand on my head as an adult, is that some of the techniques that seem routine to me and people living in arid countries may help us face a rapidly unfolding global crisis.

I want to share three lessons with you today, three lessons that we've learned from countries with water scarcity and how they've managed to survive and thrive in water scarcity crises.

Lesson 1: “Tell everyone how much water you actually have”

In order to solve the problem, we need to know the current situation

Especially when it comes to water, it's easy for anyone to turn a blind eye, and now that there's water at the tap, they're going to act like it's going to be okay forever.

But knowledgeable, drought-affected countries have introduced simple and innovative measures to help their citizens, communities and businesses understand how drought-stricken their countries are.

Earlier this year, when I was in Cape Town, I saw an electronic billboard on the highway showing the city's water reserves.

It's an idea that seems to have been borrowed from Australia, which suffered the worst drought in its history from 1997 to 2009.

Water levels in Melbourne have dropped to a very low amount of about 26%.

The city yells at people

I didn't plead with you to save water.

They used electronic billboards to display water levels to all citizens.

He showed people what the real water reserves were, and encouraged them to take responsibility for themselves.

By the end of the drought, this measure increased community cohesion as well as awareness of the emergency.

Nearly one in three Melbourne residents have installed a rainwater storage tank in their home.

The actions taken by the citizens were not limited to the installation of tanks.

With help from the city, we were able to do more effective things.

Lesson 2: "Encourage citizens to save water."

The City of Melbourne expected its citizens to save water at home.

One way to save water is to spend less time in the shower.

But research shows that some people, especially women, are reluctant to adopt such water-saving measures.

Some people said bluntly, "The shower isn't just about washing your body.

my sanctuary

It's also a place to relax."

So the city started giving away water-saving shower heads for free.

And some people complained that the showerhead didn't look good or fit in their bathroom.

So the so-called "showerhead team" has developed a small water flow regulator that you can attach to your existing showerhead.

I don't care what a shower head looks like, but I think it's great that the team didn't give up and came up with a simple and unique solution to help everyone save water willingly.

In less than four years, over 460,000 showerheads have been replaced.

When the small water flow regulator was introduced to the public, there were over 100,000 orders.

Melbourne has managed to reduce per capita water demand by 50 percent.

In 2010, the United Arab Emirates, the second-most water-poor country in the world, designed what it called the Business Hero Toolkit.

The aim was to encourage companies to do more to reduce their water and energy consumption.

The toolkit helped companies learn how to measure their water consumption and get ideas to reduce their consumption.

This kit worked

Hundreds of organizations have downloaded this toolkit

Several organizations have joined what's called the "Corporate Hero Network," a community where companies voluntarily set targets to reduce their water consumption within a year.

Companies that met the challenge saved an average of 35% water

For example, one company implemented as many water-saving ideas as possible in its offices.

They changed the way toilets are flushed, the faucets, the showerheads, everything.

We replaced them with water-saving products wherever possible, and as a result cut our employees' water usage in half.

Encouraging individuals and businesses to save water is very important, but it's still not enough.

Countries need to look beyond the status quo and look at the problem and implement measures to conserve water at the national level.

Lesson 3: Look under the surface of the problem.

Saving water comes from unexpected places

Singapore is the eighth most water-scarred country in the world.

We rely on imports for approximately 60% of our water needs.

It's also a very small island.

So we need to use as much land as possible to store rainwater.

So in 2008 we built a marina barrage.

It's the first urban reservoir built in the center of an urban area.

It's the largest water storage facility in the country, nearly one-sixth the size of Singapore.

What's so amazing about the marina barrage is that it's built to take full advantage of its size and was built in an unexpected and actually very important location.

It brings three valuable benefits to the country: Singapore's water supply has increased by 10 percent; the dam connects it to the sea, protecting low-lying land from flooding;

All that effort is great, and it doesn't have to be visible.

I realized that my home country of Jordan consumes most of its fresh water in agriculture.

So we decided to focus on encouraging crops that need less water.

To achieve that, local farmers increased their production of dates and grapes.

These two crops are much more drought tolerant than many other fruits and vegetables, and at the same time they are highly valued crops both locally and internationally.

Locals in Namibia, one of the driest countries in southern Africa, have been drinking reclaimed water since 1968.

You will say that many countries reuse water.

That's right

But only a very small percentage of people use reclaimed water for drinking, and that's because people don't want their toilet water going to tap water.

But in Namibia, we couldn't say that.

To save water, we looked under the surface of the problem.

It's a great example of how other countries are tackling water shortages and implementing measures to purify wastewater to drinking standards, and Namibia, for example, provides drinking water to more than 300,000 people in its metropolitan area.

Many countries that were once water rich are now water scarce, so we don't need to find new solutions here.

If you look at what water-stressed countries have achieved, there is already a solution.

It's really up to us to put it into action.

Thank you

(applause)

Hello

Good morning

If you've seen my TED profile, you might think that I'm going to talk about the latest trends in philanthropy, how Wall Street and the World Bank are talking about how we invest in women, how we protect and save their rights.

i am not

I'm interested in how women are saving us.

They help us by overturning our familiar polarizing views of things and envisioning different futures: tradition and modernity, underdeveloped and developed countries, oppression and opportunity.

As we face many challenges as a global society, this third path is exciting to me.

The most fascinating thing to me is that women are doing this in a difficult and interesting contradiction.

Why is it that, in many societies, women are so much oppressed by customs on the one hand that they are the guardians of culture on the other?

Is the hijab and scarf a symbol of submission or defiance?

With so many women and girls being beaten, raped and mutilated every day under the guise of honor, religion, nationality, what makes it possible for women to replant trees, rebuild societies, and change societies through radical, non-violent activism?

Women defending culture and women in radical movements

Are they different people?

As Chimamanda Adici said at TED at Oxford, have we forgotten that there is more than just one story about women fighting for their rights?

And if so, what is the position of men?

Most of my life has been a long road to answering these questions.

It has taken me around the world, and I've met some amazing people.

In the process, I was able to find some pieces of a complicated puzzle.

Some of the people who have awakened me to the Third Way are the devout Muslims of Afghanistan, the singing lesbians of Croatia, and the taboo-breakers of Liberia.

I am indebted to them. To my parents as well, maybe they did something wrong in their previous lives, and they gave me three girls.

And for some reason I'm very proud of the three of us.

I was born and raised in India and from a young age I watched with skepticism when my aunts and uncles would come over and bend down to stroke our heads and say to my parents without a problem, "Poor girl, you only have three daughters.

But I'm still young, so I can still do my best."

Anger about women's issues reached its peak when I was 11.

My aunt, a smart and talkative woman, was widowed at a young age.

relatives came and surrounded her

take away her colorful sari

dressed in a white saree

wipe the bindi from her forehead,

broke her bracelet

Her daughter, Lani, who was a few years older than me, was just sitting on her lap, confused, unable to comprehend what had happened to her mother, who had always been a confident woman.

Later that night, I heard my mother begging my father, "Please, Ram, can you do something about it?"

And my father said in a low, muffled voice, "I'm the youngest brother, so I can't do anything."

"This is tradition"

That night I learned the rules What it means to be a woman in this world

Women don't make these rules, but they bind us, our futures, our opportunities.

And men are also affected by this rule

My father fought in three wars, but he couldn't save his sister from suffering.

By the time I turned 18, under the tutelage of my wonderful mother, as you can imagine, I was fully feminist.

Raise your fists by the roadside, (Hindi) (Hindi) "We are Indian women

It's not a flower, it's a spark of change."

By the time I arrived in Beijing in 1995, I believed that the only way to achieve gender equality was to overturn centuries of oppressive traditions.

As soon as I got back from Beijing, I started working for an organization founded by women that supports organizations that promote women's rights internationally.

But less than six months into the job, I met a woman who changed my mind.

Her name is Sakina Yakoubi

She came to my office when no one in America knew where Afghanistan was.

She said, 'burqa doesn't matter'

She was the most determined women's rights advocate I've ever met.

She told me that in Afghanistan, women run schools in secret. Her organization, the Afghan Institute for Learning, started a school in Pakistan.

"Every Muslim knows that the Koran demands and supports literacy," she said.

The Prophet Mohammed wanted all believers to read the Qur'an for themselves."

eh? Really?

How can a woman's rights advocate cite religion!

But Sakina is unconventional

She always wears a scarf around her head But I walked with her along the beach with her long hair flowing

She begins every class with a prayer, and she's a single, vibrant, financially independent woman in a country where she's married at the age of 12.

she is also very practical

"This outfit and scarf around my head gives me the freedom to do what I have to do and talk to people who need to ask for their support."

“When I opened a school in a refugee camp, I went to see the Imam.

I told him "I am a believer. In this dire situation, women and children need faith to survive." She laughed mischievously.

"He was delighted

Women couldn't go to the mosque, so he came to my center twice a week.

And after he left, the women and girls remained behind.

We started with a small literacy class to read the Quran, then math, English, and a computer class.

Within weeks, everyone in the refugee camp was coming to our classes.

Sakina is a teacher at a time when being involved in educating women is a dangerous business in Afghanistan.

She's on the Taliban's target list

I worry every time she travels to Afghanistan

When I ask about safety, he shrugs his shoulders.

"Kavita Jean, we ain't the time to be scared

I have to follow the example of girls who go to school even after having hydrochloric acid poured on their faces."

As I smiled and nodded, I found myself watching women and girls take advantage of the traditions and practices of their own religions to rebel and seize the chance to build their future.

In their own way, Afghanistan is heading in a different direction.

What it means to be different Lezboa women from Zagreb, Croatia know better

Being a lesbian, being homosexual is a very uncomfortable and prejudiced position in many countries around the world, including here in India.

In post-conflict countries like Croatia, extreme nationalism and religion have created an intolerable environment for the social marginalized.

Then came a group of young lesbians who loved old music, music that spread from old Macedonia and Bosnia to Serbia and Slovenia.

These folk singers met in a gender studies class at university.

Most are in their 20s, some are mothers

Many were unable to come out in their own communities because of their religious beliefs, which made it difficult for families to accept that their daughter was gay rather than sick.

According to Leah, who helped found the group, "I really like traditional music.

i like rock too

So at Lesbian Boa we blend the two

Singing traditional songs is also a rebellion for us to have our true voices heard, especially those of other ex-Yugoslav countries.After the war, many songs disappeared.

But they're part of our history, they're childhood memories, and they shouldn't be forgotten."

Unexpectedly, this LGBT choir shows how women, through tradition, are making a difference in society, like an alchemist turning discord into harmony.

Their repertoire ranges from Croatian national songs to Bosnian love songs to Serbian duets.

Leah smiled and said, "Kabitta, we're especially good at Christmas songs. The Catholic Church hates us, but you can show that we're open to religious conventions."

Their concerts, of course, attract peers like them, but they also attract older generations, who may be suspicious of homosexuality, but who are nostalgic for their music and the past that it symbolizes.

The father, who was initially angry about his daughter's coming out in one of these choirs, is now composing a song for them.

In the Middle Ages, lyrical poets sang, told stories and read poetry as they traveled around the world.Likewise, Lesboas traveled singing throughout the Balkans, and along the way, brought together people who were divided by religion, nationality and language.

Bosnians, Croats and Serbs discover a precious, proudly shared space, and Lesboa reminds them that no matter what song one group claims to be theirs, it's the song of all of them.

(Chorus) Yesterday, Malika Sarabhai taught us that music has the power to create a world that is more tolerant of differences than the one we've been given.

Reymah Bowie was given a world of war.

Liberia was in a terrible state after decades of civil war.

Reima was not a peace activist, she was a mother of three.

But she was overwhelmed with worry. She worried that her son would be kidnapped and turned into a child soldier. She worried that her daughters would be raped.

One night she had a dream

She stopped a bloody war with her thousands of female allies.

The next morning she consulted other women at church.

We were all tired of the war

"Leaders know that we need peace and will not rest until we have it."

Reima had a friend who was a Muslim policewoman.

She promised to tell the story in her community

During the next sermon on Friday, the women sitting at the far end of the mosque started talking about how they felt about the state of the country.

"What do you mean?" "The bullet doesn't distinguish between Muslim and Christian."

These women were determined to end the war, and they used their own traditions to do so. Liberian women usually dress colorfully with lots of accessories.

But for this protest, everyone wore white and showed up with their bare faces.

As Reima put it, "We wore white and said we came for peace."

They stood on the road that Charles Taylor's motorcade passed every day.

They stood for weeks, first ten, then twenty, then fifty, then hundreds of women, dressed in white, singing, dancing, saying, "I'm here for peace," and standing.

In the meantime, rival factions in Liberia entered into peace talks in Ghana.

The negotiations dragged on for quite some time and did not seem to end.

Reima and friends felt that they had had enough

With the rest of my money, I sent some women to the peace talks and surrounded the building.

They sat on the floor with their arms crossed, as seen in the now-famous CNN video.

It's in India too (Hindi)

Then I became more nervous

The police were called in to move the women by force.

As the senior officer approached with the baton in her hand, Reima deliberately stood up, put her hand over her head and slowly began to undo the cloth covering her hair.

The video clearly shows the police officer's expression.

he looks embarrassed and backs off

And I looked around and the police were gone.

Reima later explained, "In West Africa, it's taboo.

If an older woman voluntarily undresses in front of a man, that man's family will be cursed."

(Laughter) (Applause) "I don't know if he really believed it, but he seems to have understood that we were never going to move from there.

We weren't going to leave until a peace deal was agreed."

and a peace deal was agreed

And then Liberian women scrambled to win the elections for Ellen Johnson Sirleaf, who herself broke taboos and became Africa's first female head of state in a long time.

In her presidential inaugural address, she thanked the courageous women of Liberia, even if they just won against a soccer player presidential candidate.

Women like Sakina, Leah, and Reima have humbled me, changed me, and taught me not to jump into guesswork about anything.

You saved me from selfish anger by showing me the third way.

A Filipino activist said to me, "Do you know how mochi is made?

Fire from above and below at the same time."

The protests, the marches, and the firm stance that women's rights are human rights.

fire from below

Malcolm X, women's suffragists, gay parades.

But we also need fire from above

And in most of the world, that top is ruled by men.

As Marx said, "Women make change, but not at will."

they have to negotiate

They must overturn oppressive traditions and find new hope.

and they need allies

A friend like the imam, a friend like the father who wrote songs for the lesbian choir, a friend like the policeman who respected the taboo and withdrew, a friend like the father who helped his three daughters achieve their dreams, even if he couldn't save his own sister.

Perhaps this is because feminism itself, unlike other social movements, is not a battle against any one particular oppressor.

And perhaps the greatest beauty of feminism is that the personal is political.

As Eleanor Roosevelt said about human rights, gender equality starts in the smallest place, closest to home.

Of course, it's true in the streets, in negotiations around the kitchen table, in a couple's bedroom, and in relationships between lovers, parents and children, sisters and friends.

And finally, by incorporating a piece of tradition and community into their own battles, women like Sakina, Ria, and Leima, and even Sonia Gandhi in India, Michelle Bachelet in Chile, and Shirin Ebadi in Iran, are doing something different.

They're trying to overcome the Western model of development.

They say they can make a difference without being like Westerners.

Whether we wear saaris and hijabs, whether we wear pants or bobs, we can be party leaders, presidents, human rights lawyers.

We can use our traditions to make a difference

We can demilitarize society and ensure real security in return.

In every little story like this, we see stories of radical change being written by women all over the world.

My hope is that each of these threads will be spun into a strong fabric that can sustain a community.

And what excites me is that in these tiny crumbs, sometimes you get a glimpse of a whole new world.

it's definitely heading here

thank you

(applause)

(Chris Anderson) Stuart 60's — You launched a magazine in '68 [Whole Earth Catalog]

(Stuart Brand) Exactly! [Global Catalog]

Originals are hard to come by [Whole Earth Catalog]

(Anderson) It's the first one.

(brand) yeah

CA: Why did this have such a big impact?

(Brand) Counterculture was a big thing that I was involved in at the time, and it involved hippies and the New Left.

Those were my contemporaries, and I was a little older than them.

My style is to find interesting trends and explore the opposite direction.

(Anderson) (Laughter) (Brand) That's what I was trained to do in the military, but it was also a quick way to find something original, and look in the opposite direction of what everyone else was doing.

The counterculture was -- the hippies were very romantic and they hated technology, except Sandoz's high-quality LSD.

Because the computer says "Don't do that, don't do this"

"I have to fight against such things"

So The Whole Earth Catalog was anti-countercultural because I took Buckminster Fuller's idea that tools are essential.

Science and engineers define the world in interesting ways.

If all the politicians disappeared for a week, it would be... troublesome.

But when all the scientists and engineers disappear for a week, it's nothing short of "troublesome."

CA: At least we still believe so.

(Brand) think about it

The New Left proclaimed "power in the hands of the people"

People like Steve Jobs and Steve Wozniak said, "Power in the hands of the people" and "Tools that actually work for the people."

Fuller said, ``Don't try to change human nature.

So what's efficient is that if you want to change the world for the better, instead of trying to change people's behavior like the New Left, you should give them the tools to naturally move them in that direction.

That was the attempt at Whole Earth Catalog

(Anderson) Stuart This cover is one of the first images humans have seen of Earth from space.

It was also groundbreaking

BR: Coincidentally — my LSD experience on the rooftops of San Francisco in the spring of '66 made me start thinking about what Fuller said again. Many people believe that the Earth is flat and that its resources are infinite.

"Spaceship Earth" is a metaphor for that.

I thought it would be nice, with a hundred micrograms of LSD, I kept getting high on the roof of my San Francisco house, and the downtown buildings in front of me seemed to fan out like this instead of being parallel.

That's because the building was built on a curved horizon.

If I had climbed higher, I would have seen it more clearly If I had risen higher, I would have seen it more clearly From high enough, the horizon would have circled And I would have seen the round Earth from outer space

So I thought, mankind has been in space for 10 years, back in '66, the camera had never looked back at the Earth

All I could see was the outside or part of the Earth

Why hasn't anyone seen a "global picture" of the entire Earth yet? I thought

The story went around and through NASA, through the legislators and directors, through the people in the Politburo in the former Soviet Union, and through the people.

And then two-and-a-half years later, The Whole Earth Catalog was published, and this image came into the public eye, and it really changed everything.

Civilization hacking, in my opinion, is doing something clever and clever -- somehow tricking the situation.

And these pictures -- at last week's "March for Science," they had a "The Whole Earth Catalog" placard or something, and I did it effortlessly.

I just sold tin badges for 25 cents each.

Tinkering with the system is not only the most efficient way to make the system evolve in interesting directions, but it's also the safest way to do it, because if you try to forcefully change the whole system, you're going to run into a lot of obstacles, but if you tweak the details, the system will adapt to it.

CA: Anderson: You've been doing a lot since then. You're a leader in environmental activism, you're a champion of the counterculture.

I would like to ask about them

tell me about this image

(Brand) Haha!

This National Geographic map is the steppe tundra, and this is what the Arctic and sub-Arctic landscapes used to look like.

Actually the whole world was like this

The abundance of large animals found in South Africa and Tanzania's Serengeti National Park was once seen in parts of Canada, the United States, Eurasia, and the rest of the world.

This was normal and it may be like this again

So, in a way, my long-term goal right now is to bring back these animals and the grasslands that they created, which in the long run might be a system that stabilizes the climate, but also bring back the mammoths in the background that play a role in the scenario.

This is probably a goal that will take 200 years

Maybe in 100 years, by the end of this century, we will be able to slow the rate of extinction to that of ordinary animals.

It's going to take longer to restore the rich ecosystem, but it's worth it.

CA: How should we think about extinction, apart from mammoths for a moment?

Clearly one of the big concerns right now is that extinctions are happening at the fastest rate in history.

this idea is common

What do you think of that?

BRAND: The story out there is that we're in the Sixth Extinction, or in the beginning of it.

We are promoting the restoration of extinct species and the prevention of extinction under the name of "Revive & Restore," so we have started researching what actually goes along with extinction.

I've found that it's full of chaotic data, and it's oversimplified that we end up with—

The yellow triangles here represent the last five mass extinctions, and the next one is imminent.

The final extinction is shown on the far right Dinosaurs went extinct 66 million years ago when a meteorite fell.

And humans are said to be the next meteorite.

This is what it means

When I wrote one of my papers, I researched that when 75% of all species in the world die out, that's a mass extinction.

Humans have discovered 1.5 million of the approximately 5.5 million total species

And 14,000 species are discovered each year.

There are many different creatures in the world

Since 1500, 500 species have gone extinct, which makes the term 'mass extinction' used strange.

About a year and a half ago, Carl Zimmer reported on the front page of the New York Times, "Large-scale survey reveals ongoing mass extinction in ocean."

I read that article, and it says that 15 species -- only 15 -- have gone extinct in the ocean since 1500, and by the way, in the last 50 years, no species has gone extinct.

If you read further, it says something terrifying: it says that overfishing is reducing the number of fish in the ocean by 38%.

it's serious

But none of the species are likely to go extinct

This is how a reporter writes a panic-inducing sentence in the title of an article.

It's kind of like inflammatory clickbait, and the reader goes, "Oh God, I'm going to panic, all the sea creatures are going extinct!"

I have no such prospects

In fact, if you look into the details, the "Red List," or the List of Threatened Species, lists about 23,000 species as being more or less threatened with extinction, and this list is produced by the International Union for Conservation of Nature (IUCN).

Nature magazine published an article on wildlife extinction studies that said, "If all 23,000 species go extinct in the next 100 years or so, and the rate of extinction continues for centuries to millennia, we may face a sixth extinction."

This kind of exaggeration is totally unmanageable

Environmentalists always exaggerate

that's the problem

CA: Activists probably feel a sense of moral responsibility because they care about what's happening in front of them, and if they don't speak loudly, no one will listen.

(Brand) Moral Moral, you say -- "moral hazard" or "precautionary principle" or whatever, these words exist to deny things.

CA: So you're saying that the problem isn't the extinction of fish and animals, but rather their overgrowth, and that we humans are contributing to some of the overgrowth?

(Brand) Yeah, we're losing money because of the excess growth—

Agriculture is the main culprit, so if there's a way to improve farming, make it more compact, and be more productive, even GMOs, do it.

It is also good for people to move to cities.

It's a good thing that farmland doesn't destroy nature.

(Anderson) There is a lot of talk about "rewilding," which means reviving extinct species and returning them to the wild.

What does it mean to release an animal into the wild in the first place?

(Brand) Hahaha! it's a wolf

To tie in with what I just said, Europe is probably at its peak in terms of arable land now, and in terms of population, we're already the most populous generation in history.

From now on, the birthrate will continue to decline

We are the last generation of humankind to experience an explosive population explosion, and the world's population will reach 9 to 9.5 billion, and after that, it will start declining rather than leveling off.

Similarly, the area of ​​arable land is at an all-time high, but Europe has abandoned farmland that is quickly reforested.

That's why we don't build corridors to connect wildlife habitats.

We don't need it in Europe, where there's a lot of connected farmland and reforested wildlife corridors, and wolves, for example, are back in Spain.

I'm moving all the way to Holland

Bears and lynx are back

I didn't even know that golden jackals existed

It's coming back from Italy to all of Europe.

Unlike here, they're all predators, which is funny.

Europeans are happy to see them again

CA: And surprisingly, when predators return, they often do not diminish the diversity of the underlying ecosystem, but rather increase it.

(Brand) Yes, usually predators and large animals, large animals with sharp fangs and claws, are proving to be very important for very rich ecosystems.

CA: I'm naturally intrigued by your involvement in this dramatic rewilding project.

Why would you want to revive something like the dreaded Woolly Mammoth?

(Brand) Asian elephants are the closest relatives to woolly mammoths, about the same size and genetically very similar.

Asian elephants differentiated fairly recently in evolutionary history.

Asian elephants are closer to woolly mammoths than to African elephants, and close enough to African elephants that they were able to crossbreed.

We're working with George Church at Harvard University, and he's already isolated genes for four major traits from the well-preserved and well-studied woolly mammoth genome by what they call "ancient DNA analysis."

And then we transplanted that genome into the appropriate genetic site in an Asian elephant cell line in the lab, and CRISPR allowed us to do that.

We don't randomly throw genes in like genetic engineering —

Edit an allele with CRISPR and replace it with a different allele.

It's like adding traits that make the Asian elephant's germline cells more Arctic-friendly, like planting them there.

And through this process through an Asian elephant surrogate mother,

It produces what conservation biologists call a "surrogate" for the woolly mammoth, a hairy, tusked Asian elephant, and perfectly adapted to subarctic life.

People often ask me, "How do you get elephants to live there?

Asian elephants hate snow, don't they? ”

However, Asian elephants actually like snow.

A few at the Ontario Zoo have made snowballs bigger than people.

I love rolling little snowballs with my long nose to make them bigger

And then they ask me, "But you're probably 22 months pregnant.

Such cross-species cloning is difficult.

Are you going to sacrifice some surrogate Asian elephants? ”

George Church of Harvard said, "It's okay.

Using an artificial womb to raise a fetus."

People say, "Maybe in the next century..." But news this week appeared in Nature magazine that a baby sheep is developing in an artificial womb system and is four weeks old.

It's already half a sheep's gestation period.

This is now coming to fruition

CA: But why do we need a world like that, imagine a world with thousands of these animals roaming Siberia?

Is it a better world now?

(Brand) Maybe. (Laughter) There are three groups that are serious about studying woolly mammoths, and our "Revive & Restore" group is right in the middle. George Church's group at Harvard University is doing genetic research. made a place

Research so far suggests that there are now 1/100th of the animals that used to live there.

There were many animals like the picture I saw earlier

now there aren't many

Most of the tundra is covered with moss, and there is also boreal forest.

That's how it is, there are only a few animals there

There they brought a lot of herbivores, musk oxen, Yakut horses, bison, and now they're bringing in more.

Grasslands are made by herbivores

Herbivores eat up grass and perform several functions.

First, turn the tundra, or moss-covered land, back into grasslands.

Grasslands fix carbon dioxide in the atmosphere

In a warming world, the tundra is melting, releasing large amounts of carbon dioxide and methane gas.

With only 25 square miles of land, they're regulating the climate.

Part of the story is that the boreal forest absorbs sunlight very well, even in the snowy winters.

The mammoth steppes once circumnavigated the North Pole Around the North Pole there is a vast expanse of land that was once grassland.

The steppes were magnificent, perhaps the largest in one of the world's most productive biomes (groups of organisms in an environment).

In the forest there, Sergei and Nikita Zimov are knocking down trees in an old tank they got for free.

It's tedious and tiring work. As Sergey says, "Trees don't poop!"

But all large animals, including mammoths, poop.

Mammoths have become what environmental biologists call "umbrella species."

Umbrella species are amazing -- like the pandas in China or elsewhere -- by improving their living conditions, they're creating habitats and ecosystems that are good for many plants and animals. Ideally, they'll reach a self-sustaining environment, where conservation biologists can step in and say, "All we need to do is keep out these invasive species. This environment can sustain itself."

CA: You've been thinking about reviving a lot of species from extinction over time. But the next question I want to ask you is how mammoths can kind of green Siberia.

It's been said that deforestation is one of the most terrifying curses of our time, and one that has a huge impact on climate change.

You sent me this graph, or rather, a map.

What does this map show?

(Brand) Global greening

When you read the news headlines and stories that short stories tell, what you should do is watch what else is going on.

Al Gore, the leading narrator of this narrative, said, "Climate change that threatens civilization is occurring very rapidly.

We must stop producing any more greenhouse gases as soon as possible, especially carbon dioxide, or we will be in serious trouble."

They're all true, but they're not all told And the whole story is more interesting than the fragmented story

plants prefer carbon dioxide

Plants use sunlight and are made of carbon dioxide and water.

That's why in many industrial greenhouses, the plants that feed the carbon dioxide feed on it.

Based on satellite research, and this is a graph for the last 33 years or so, the amount of leaves on trees has increased by 14 percent.

biomass has increased

It's what ecologists call "primary production."

There's more life going on, partly because of climate change, partly because of those damn coal mills.

What the hell is going on?

By the way, because crop yields go up along with this,

This is to some extent a countermeasure against increasing carbon dioxide, because there are more plants that are absorbing carbon dioxide.

The plant dies, rots, and either returns to the atmosphere or is absorbed by the roots and remains in the soil.

These things also need to be kept in mind. The deeper story is that thinking about, working with, and geoengineering climate is a very complex process.

it's like medicine

Always tinkering with the system to see how it could be better

I kept trying to improve and suddenly — oops, I went too far! Half-turn reverse

CA: But some people might think, "Not all greens are created equal."

Maybe we're trading the beauty and diversity of our rainforests for something like green algae and grasses in swamps.

BRAND: In this study, we found that all plants were growing.

What's interestingly missing from this study is what exactly is going on in the ocean.

The primary production of the sea — the biota of the sea, of which the role played primarily by microbes is perhaps the most important.

Microbes produce the atmosphere we breathe, but that's not included in this study.

James Lovelock argued that our knowledge of oceans and sea life is, in some ways, a haze.

That's why we're understanding the role of the ocean through over-enhancing atmospheric carbon dioxide and unintentionally poor geoengineering.

Now, the ocean is expanding due to rising sea temperatures.

This is the main reason for sea level rise, and if global warming progresses, more damage will occur.

Some of the reefs are badly damaged, like off Australia.

The Great Barrier Reef is bleaching due to rising temperatures.

So Danny Hillis and I said in our earlier conversation, "Geoengineering is worth trying to see if it works. In the face of global warming, if we can buy time, we can fine-tune the system with small but useful studies, and then decide whether to take further action."

CA: So for the rest of the time, let's focus on this, because it's a very important story.

In the recently published book by Yuval Noah Harari,

They say the next evolution of humanity will be like humans becoming god-like beings.

I think he's — (Brand) you've talked to him, you've read his books.

i haven't finished reading

I don't know what you mean — (Anderson), but it's a pretty bold idea.

He believes that we're going to use data and bioengineering to completely transform humanity into a whole new kind of creature with supernatural powers, and that there's going to be tremendous social inequality.

We are about to write a whole new and bold chapter in history.

he believes that

(Brand) What did he think of that?

CA: I'm nervous, but he also seems to like to provoke people.

(Brand) Are you worried?

(Anderson) I'm worried

A lot of what I see and hear at TED makes me excited and nervous.

The optimistic part of me tends to think, "This is great, it's exciting!"

(Brand) Isn't that your TED secret?

continuous tension and excitement

CA: It's also a bit of a recipe for schizophrenia.

he didn't quote you

I was so surprised by your words, this memorable closing line of yours in The Whole Earth Catalog, "If man is like God, let's try to be like him."

and recently you upgraded it

please tell me about that idea

BRAND: One of the things I'm learning is that writing is much better than just memorizing.

And what I learned from someone was what was written on Twitter.

It changed my life —

And when someone quoted this phrase, they said it was theirs, and then someone else said, "But that's not what you said in the first Whole Earth Catalog, published in 1968.

"If humans are like gods, why don't we get used to it?"

Story — this damn story we tell ourselves Over time it turns into a lie

So writing it down can get you through it

It became ``If humans are like gods, let's try to be like that.'' That was The Whole Earth Catalog.

By the time he wrote "The Global Issue: A Real Environmentalist Manifesto," he said in light of climate change, "If humans are like God, we should try to be like him."

(Anderson) "If a man is like God, he should try to be like God."

Let's talk about this: Quite a lot of people react emotionally when you talk about geoengineering. Some people reject it for religious reasons, saying that it's impossible for humans to act like gods. Most people think it's awe-inspiring.

(Brand) It's like the Greek story about arrogance.

When I get too confident, I start sleeping with my mother

(Laughter) (Anderson) I can't believe you said that.

(Laughter) (Brand) It's the story of Oedipus.

Arrogance should always be kept in mind

There's one thing I try to do I count my mistakes every day

I was educated as a scientist, and I'm just happy to be back working with other scientists.

Science is organized skepticism

So always, even when things look good, not only do we stay completely skeptical about whether it's really working as it seems, but what else is going on? think

This "what else is going on?" question is the way to avoid being fooled by fake news.

It's not necessarily real news, it's more complex news like the one you're trying to address.

CA: So, going back to applying this to the environment, the idea is that whether we like it or not, humans already control so many things that happen on Earth, but we do so unintentionally, so we should start to control it intentionally.

What does it mean to strive to fulfill God's role?

What should I do?

Are there any small experiments or systems that you can try and play around with?

What should we think about?

(Brand) It was Gregory Bateson who made me graduate from allegiance to Buckminster Fuller and instilled in me that idea.

Gregory Bateson was an epistemologist, an anthropologist, a biologist, a psychologist, an expert in many fields, and he studied how systems perceive themselves.

I think that's the perspective that you should always have about your research subject.

What I like about David Keith's approach to geoengineering is that it doesn't jump right in.

His approach -- and that's what Danny Hillis was talking about earlier -- is to build it up little by little, to play with the system a little bit, see how it reacts, and get a better understanding of the system.

This approach is an answer to people's legitimate opinions, "What are we dealing with?

The workings of the climate system are still poorly understood.

You can't operate a system you don't understand."

David's answer is, "It's the same with the human body, but medicine still advances, and people are happy about it."

The way to engineer a large, complex system that you don't fully understand is to tinker with it bit by bit, which is the exact opposite of a pompous approach.

— try to change this a little bit, if you have a problem, pull back quickly, if it's okay, expand it, while doing other things at the same time.

That's what's important about diversity and dialogue, and that's what Sebastian Thrun said earlier.

The non-arrogant approach is to try to get "social permission" first, and I think that's a pretty good term. It's getting people involved in working on interesting, difficult, deep problems until they're deeply understood.

Sebastian and I are optimistic because we have people like Steven Pinker, author of The Human History of Violence, and so far so good.

But things may change at any time, but I believe things are going in the right direction, and we can find the tools to do that and develop them further.

that's what it is

CA: Stuart, let me conclude on a note of optimism.

I admire you for always challenging yourself and others.

I think it's very powerful that he never allows absolute overconfidence and maintains suspicion.

I want to learn more about that attitude for my own sake. Today's conversation has been both insightful and inspiring.

It was Stewart Brand. Thank you.

(Brand) Thank you

(applause)

I started obsessing over records when I was about 12.

My parents would often give me money to buy food, but instead of buying food, I would save it and buy records on the weekends.

This is a giant Walkman that's half the length of my foot and me. (Laughter) It's more like a VCR.

(Laughter) So when I was a teenager, my desire to collect cassettes, records and CDs grew more and more.

I worked at a record store for many years, so my part-time job was paid for records.

One day I realized that I could never listen to all the records I had collected in my lifetime.

Like many of my peers, I became a record junkie, or what we call ourselves, a record digger.

Digging up records is just what it sounds like — it's dirty work.

That means spending hours rummaging through warehouses, church basements, yard sales and record stores, finding records that have been forgotten for decades.

They're records that are culturally obsolete.

Thanks to the early record collectors from the 1930s to the '60s, many important records that would otherwise have been shelved were found and preserved.

At the time, most cultural institutions and public institutions weren't interested in custody of such treasures.

In many cases, those records ended up in the trash.

Record digging is a way of life

We're obsessed with no-name records, expensive records, super-cheap records, weird artwork, sub-subgenres.

Don't miss even the slightest changes in each release

When the media talks about the recent resurgence of record popularity, it's often overlooked by the record digging community that has preserved records, traditions and culture for the last 30 years.

It's a tight-knit, but somewhat competitive community, because you're looking for a very rare record, and if you miss the opportunity, you might never see it again.

But the only person who feels strongly about a record collector is another record collector.

To the outside world, we are a very strange and eccentric group.

And -- (Laughter) Most of the time, that's correct.

All the record collectors I know are hardcore geeks.

everyone has something out of the ordinary

But I think our image should be

(Laughter) We are musical archaeologists.

searching for lost works of art

All of us have a list of records we desperately want, and we've been looking for for years, and we call this list "The Cravings."

When you're digging for records, you're surrounded by music you've never heard.

You'll be surrounded by people's thoughts on records, mysterious things, dreams of all kinds.

Imagine the thousands of musicians who were destined to become masters but were overlooked for all sorts of reasons.

Very few of these records survive, and some have never been discovered or heard.

It is truly an endangered species

I'm going to tell you a story that, for me personally, is a story that epitomizes the value of record diggers.

This is the story of a talented musician and composer from Montreal.

Henri-Pierre Noel was born and raised in Haiti, but has also lived briefly in the United States and Belgium.

I stopped in Montreal for two weeks, and then I lived in Montreal for 40 years.

Having learned to play the piano at a young age, he developed a very unusual way of playing, with super-fast speed, almost like a percussion instrument.

It was a mix of influences from Haitian music that he had heard since he was born, and influences from American folk music.

He created a mix of funk and jazz for a Haitian music compa.

As a young man, he toured the West, playing with live bands, but it wasn't until he moved to Canada that he recorded albums and songs.

In 1979, he released his first album, Piano, in Montreal.

It was released under the name of a private label called Henri-Pierre Noel Records.

He was able to produce only 2,000 records.

The record was on the radio a few times, thanks to a little help from Canada and Haiti, but without the big label backing it struggled a lot to sell.

At that time, if my record wasn't on a popular radio show, it wasn't on the jukebox, it wasn't on television, it was a huge disadvantage.

It was much harder than it is now to put out an album without being on a major label.

He released a second record soon afterward, and while he was actively playing the piano in various clubs around the city, his record gradually fell into oblivion.

After 30 years, the 2,000 albums quickly dispersed, leaving only a few remaining in the world.

Then, in the mid-2000s, a Montreal record digger named Koval went on his weekly record hunt.

He was at a flea market, surrounded by thousands of dirty, dusty, moldy records.

I found "Piano" on this spot

The product was different from what I was looking for

In a way, records drew him.

It can be said that thanks to the record excavation that I have continued every week for 20 years, my sixth sense of finding treasure has been honed.

He took the record in his hands and studied it, the artwork on the front, the liner notes on the back, and what really got him going was the fact that it was made in Quebec in the late '70s by a Haitian, so he was intrigued.

He pulls out a small plastic turntable that he carries around so he can listen to it at all times during the excavation.

let us also listen

(Music) He fell in love with the music in an instant, but he felt compelled to look into the background of the record.

I didn't even know where it came from

What he knew was that the musician was living in Montreal at the time, and he spent months trying to find him.

The record case even contained Noel's business card.

Henri-Pierre Noel loved DIY so much.

Of course, I called the contact number written on the business card I found in the record case, but after 30 years, I couldn't get through.

In the end, in Belgium, where Noel used to live, Koval managed to find someone who knew him personally and gave him his contact information.

Finally meeting the artist, Koval promised that one day he would find a way to reissue the album.

Then I arranged for the British label Wah Wah 45s to re-release the two albums.

As is often the case with re-release projects like this, it becomes very difficult to find the original master tapes from the sessions.

A work of art can be destroyed by fire, flood, earthquake, thrown in the trash, or lost forever.

But luckily, Noel's tape was safe and ready for remastering.

The record was finally reissued, and was well received by music critics, DJs, and listeners around the world, the kind of response it should have had in 1979.

This led Noel to make the decision to get back into music, to get back on stage and play for a new audience.

Now in his 60s, he told me, "This changed everything.

I was planning my retirement life, but now I'm playing radio shows in London, Canada and elsewhere."

It also gave him the opportunity to perform for the first time in front of his three sons.

You could say that this is a story that maximizes the work of record diggers.

Beyond rarity and monetary value -- and honestly, it's very important -- but true greatness is giving a piece of art another chance and saving it from oblivion.

The job of a good record digger is to repeat the following three steps.

The first is excavation work.

You spend hours, days, years rummaging through dirty, dusty record shelves.

To find the treasure, you need to do these things

You can go record hunting online, but to find real treasure, you have to get off your couch and explore the wilderness.

That's why we call it record mining, not record searching.

(Laughter) We are musical archaeologists.

But next time we'll all get together

We carefully select records that are worth preserving and that are meaningful to us, based on preferences, expertise, and what each of us aspires to do.

And they try to find every single piece of important information about the record, like the name of the artist, the name of the label, and very importantly, "Who's the trumpet player on the third song?"

And then you organize the records, organize the relationships, and store them.

we are the musicians

And at the end of the activity, we share the record.

Most record diggers I know also have some way of getting people to know what they've found, and they're introducing artists through album reissues, online posts, and radio shows.

We're going to put the record back in its rightful place in music history.

We are makers, curators and musicologists.

So I think most record collectors I've met over the last 20 years have some way of presenting their findings.

I think that's how we keep ourselves sane and purposeful in our insatiable obsession, because excavation can be a lonely job.

But I also think it's a job that fulfills a human desire to pass on cultural knowledge.

When it comes to the need for curation, evidence shows that in a world of overwhelming choice, too much choice can stifle discovery.

For example, if you're looking to watch something on Netflix, all you have to do is look through a list of 6,000 episodes.

Now compare this to Spotify. If you're looking for the music you want to listen to, you're looking through a list of 30 million songs.

So, as you can see, the concept of selective numbing affects music more than it does film.

Some studies have data on the impact of this.

Recent developments in the UK music market show that artists in the top 1% earn 77% of the music industry's total revenue.

This is 2013, and the situation is steadily getting worse -- or worse, I would say.

Anyway, the top 1% must be very happy.

(Laughter) What's important to me is that it's easier than ever to listen to music.

There's more music available for free listening than ever, but the choice of music is more uniform than ever.

it's sad

Her passion for music research, record discovery and curation led her to launch the website "Music Is My Sanctuary" in 2007.

Our watchword will always be "Future Masterpieces and Forgotten Treasures"

It describes a passion for discovering music and introducing the old and the new.

It started out small, but it has grown into a global platform with a large number of users and over 100 collaborators.

The number of contents has exceeded 10,000, and the number of audio contents has exceeded 500 hours.

People who use it just want to listen to more music than they do on the big music channels.

They want more niche music, but they don't have the 20 hours a week that we geeks do, so they let us do that.

Curation is at the heart of everything we do

We believe in human recommendations over algorithms

I could talk for days about my passion for finding records, but I'll end with this story.

After years of record digging, the collection of records a collector collects becomes like an autobiography.

Last year, I was DJing in Poland, and the people who hosted me had a lot of great records.

They told me who owned it, and I learned it belonged to a close friend of mine, Maceo, who passed away a few months ago.

They were inviting different people to do a project where they were going to use this collection to create new sounds, samples, DJ mixes, giving new life to the music.

I spent a few hours listening to this collection, making DJ mixes, and although I never had the chance to meet Maceo himself, it felt like me and him spent a few hours talking about records in a special way.

So for record diggers, their excavations and record collections are meant to be passed on to the next generation.

Beautiful art deserves to be treasured, shared and rediscovered.

Get Curated We're the alternative music voice to the big music channels, digital and beyond.

Stay ahead of algorithms

No matter what kind of music you like, there's a website, a radio show, a DJ record store, all of them waiting to share music with you.

We do excavation work

All you have to do is open your ears and dare to listen.

this music will change your life

thank you

(applause)

The creative process, as we all know, is a long journey from the initial idea to the final product.

Repeating the same thing over and over again, kneading it over and over again, blood, sweat and tears, years of hard work.

You go for a walk, and when you come back, you'll see the Sistine Chapel on your left—it's not a story, is it?

What is the framework of the creative process that we have focused on?

just the first part of this

It's brainstorming, it's coming up with new ideas.

I actually did four studies with different people.

I was asked to walk either indoors or outdoors.

And all these studies came to the same conclusion.

Let's talk about just one of them today.

One of the tests we used to measure creativity was, "Invent another use."

The time limit for this test is 4 minutes.

Your task is to think of as many alternative uses for everyday objects as possible.

For example, what other uses do keys have? Other than opening the lock

Certainly, it can also be used as a giraffe's third eyeball.

Well, it's interesting. It's new, but is it creative?

We had as many ideas as possible, but then we had to decide: is this creative or not?

The definition of creativity that many people agree on is "appropriate novelty."

In order for something to be appropriate, it has to be realistic.

No good!

On the "novelty" side, we need that no one has mentioned it yet.

Our definition first had to be relevant, and then it had to be novelty, that is, that no one else in the audience had mentioned it.

Even if you think you can use your keys to scratch someone's car, if other people are saying it, it's no one's idea.

But there was one person who said, "If you were dying in a murder mystery, you'd have to carve your killer's name on the ground, along with your final words."

There was only one person who said

(Laughter) This is a creative idea, because it's relevant and it's novel.

Participants either sat down and came up with ideas, or walked around on a treadmill.

(Laughter) They were tested twice on different subjects.

We divided them into three groups. The first group sat down for the first test, and the second group also sat down.

The second group sat for the first test, and took the second test while walking on a treadmill.

For the third group, this is interesting, but the first test was on a treadmill, and the next test was sitting.

So the two groups sat together for the first test, and there wasn't much difference between the groups, averaging 20 creative ideas per person.

The group walking on a treadmill had almost twice as many ideas.

They were just walking on treadmills in a windowless room.

I took the test twice.

Those who sat down both times didn't improve their grades, they didn't practice.

But the very same people who were sitting the first time, walking, fueled their creativity.

this is interesting

The people who were walking on the treadmill still showed the residual effects of walking and were still creative afterward.

That means you should go for a walk before your next important meeting, and start brainstorming right after.

Here are 5 tips to get the best results

Part 1: Brainstorm with a specific problem or topic

This isn't the "shower effect," which means it's not like you're in the shower and all of a sudden you have a new idea.

Study participants were walking consciously trying to brainstorm different perspectives.

Part 2 This is a question that is often asked Is it okay to run while running?

For me, the only new idea that might come to mind when I'm running is to stop running...

(Laughter) But if the pace is comfortable for you, fine.

I know it doesn't really matter what kind of physical activity it is.

So walking at a comfortable pace is a good choice.

Also, I want you to come up with as many ideas as possible.

One key to creativity is not getting stuck on the initial idea.

keep going

After you keep coming up with new ideas, pick one or two things to do.

You may be worried that it's hard to write it down on paper What if you forget? and

The point here is to speak up.

All the participants were voicing their ideas

You can pretend to have a creative conversation if you put on headphones and record it on your phone.

The act of writing down ideas is already sorting.

It'll be like, "Is it worth writing out?"

Think before you write. Say it as much as you can, record it, and think about it later.

The last tip is to never do it

If you're walking and no ideas come to you, let's start again some other time.

I think I'm just coming up with ideas right now. Here's my idea. Why don't you put a leash on your thoughts and grab them and take them for a walk?

thank you

(applause)

Today I want to talk to you about an idea. It's a big idea.

It will come to be regarded as perhaps the greatest idea to come in the last century.

The idea is "computation"

This idea, of course, gave rise to many of today's computer technologies.

There is more to the calculation than

It's a very deep, powerful, fundamental idea, and we're just beginning to see its power.

I've spent the last 30 years working on three big projects trying to get serious about this idea of ​​computation.

At a young age, I started my career as a physicist using computers as tools.

And then I started digging into it, trying to figure out what kinds of computations I wanted to do, and what were the building blocks that could make up those computations, and to what extent they could be automated.

And that led me to create systems based on symbolic programming, which led to Mathematica.

Over the last 23 years, we've been adding more ideas and features to Mathematica at an accelerated pace, and we're very happy that Mathematica is contributing to so many great things in research, development, and education.

I have to confess that I built Mathematica for very selfish reasons in the first place, because it was something I wanted to use, much like Galileo built his telescope 400 years ago.

What I wanted to see was not the astronomical universe, but the computational universe.

We usually see a program as something complex with a very specific purpose.

Consider the space of all possible programs

Here is a representation of one very simple program

When I run this program I get something like this

very simple

Let's change the rules of the program a little.

And you get a different result, but it's still simple.

let's change it again

It got a little complicated

If you keep running it for a while, you'll find that the pattern, even though it's complicated, has a very regular structure.

Could something else happen?

Let's do some more experimenting

Do a mathematical experiment, try, find out

I'm going to do everything I can think of with the type of program you're looking at.

This is what's called a cellular automaton

Diverse behavior can be seen

A lot of it is pretty simple, but when you look at these different patterns, something interesting happens at rule 30.

Let's take a closer look at rule 30

This one

I'm just following some very simple rules below, and I get these amazing results.

It doesn't look like anything we're used to seeing, and when I first saw this, I was instinctively shocked.

In trying to understand this, I ended up creating a whole new kind of science.

(Laughter) This science is different, and it's more general than the math-based science we've been using for the last 300 years.

How in the world does nature effortlessly create what our eyes see as so complex? it's always been a big mystery

And I think we've found the secret, just by sampling things in the computational universe, we often find things like rule 30, or something like this.

Knowing that reveals something that has long been a mystery to science.

But it also raises a new problem of computational irreducibility.

We're used to science predicting things, but things like this are fundamentally irreducible.

The only real way to know the outcome is to watch evolution.

This is related to what I call the principle of computational equivalence, which is that a very simple system can do as much computation as any other sophisticated system.

It doesn't take a lot of technology or a lot of biological evolution to be able to do arbitrary computation, it just happens naturally everywhere.

You can do it with a simple rule like this

This shows that there are areas in science that cannot be predicted or controlled, such as biological processes, economics, intelligence in space, questions about free will, the creation of technology, and so on.

Over the years I've been working on this science, I've always wondered, "What's going to be the first killer app for this?"

Ever since I was a child, I've been interested in organizing knowledge and making it computable.

Leibniz thought the same thing 300 years ago.

But I also believed that in order to progress, we needed to replicate the entire brain.

But now I'm thinking, "This scientific paradigm of mine tells me otherwise. I have enormous computational power in Mathematica, and I'm also the CEO of a company with world-class resources that can handle large-scale, seemingly crazy projects. Let's try one thing to see how much of the world's systematic knowledge can be made computable."

It's a big, very complicated project, and I didn't even know if it would work in the first place.

But thankfully this is working very well.

Last year we were able to release the first website version of Wolfram Alpha.

The purpose of this is to create a full-fledged knowledge engine that computes answers to questions.

let's try

Let's start with the easy things

[Type 2+2] Will it work...

It went well

So far so good

(Laughter) Let's do something a little more difficult.

For example... [type integrate x^2 sin^3 x dx] It does a little bit of math, hopefully gives you an answer, and then tells you something more relevant and mathematically interesting.

You can also ask questions about real world things

For example… what shall we do… what is Spain's GDP?

should answer

By the way, let me ask you a related question, let's divide Spain's GDP by something.

Microsoft's sales

(Laughter) What we're trying to do is be able to type these questions in any way you can think of.

Let's try more questions, for example health questions.

With the intention of having a lab that investigates such things

Let's input "50 year old male LDL cholesterol 140"

Wolfram Alpha then uses available public health data to figure out where it falls on the histogram.

Now let's ask about the International Space Station.

It's not just finding information from somewhere else, it's calculating in real time where the International Space Station is and how fast it's moving right now.

Wolfram Alpha knows all sorts of things

It now covers a good portion of the information that can be found in the usual reference books.

But our goal is to go deeper and broader, to make all knowledge available to all, to be the authoritative source of information on all subjects.

It's about finding answers to people's questions through computation, rather than trying to figure out what someone has written somewhere before, but using built-in knowledge to come up with a new computation for each question.

Wolfram Alpha, of course, is a very large long-term project with many challenges.

First of all, we need to collect a huge amount of different knowledge and data, so we built a large pipeline of Mathematica automation and a combination of subject matter experts.

but it's just the beginning

Based on raw facts and data [Q&gt; XLVIII + LXXII], we need to do the math to actually answer the question, and we need to implement the various methods, models and algorithms that have been developed over the centuries in science and other fields.

Even with Mathematica as a starting point, this is a huge undertaking.

Right now, Wolfram Alpha has over 8 million lines of Mathematica code written by experts in many different areas.

A key idea in Wolfram Alpha is that you can ask questions in plain language [Q&gt; tides in Long Beach when JFK died], which means we need to be able to accept and understand all the weird sentences that people put in their input fields.

I'll tell you what I thought was frankly impossible.

Two big things happened. First, the study of the computational universe gave rise to many new ideas about language. Second, we realized that having actual computable knowledge would fundamentally change the way we approach language understanding.

Now that Wolfram Alpha is out in the open, you can learn from it in action.

And there's an interesting co-evolution between Wolfram Alpha and human users, which is very encouraging.

If you look at the queries on the web today, over 80% of them are successfully answered on the first try.

This percentage is even higher for iPhone apps.

So I am very happy with this result [Q&gt; www.apple.com traffic]

But in many ways Wolfram Alpha is still in its early stages.

Everything scales really well, and we're growing in confidence.

We're going to see Wolfram Alpha technology in more and more places, whether it's public data on websites, private knowledge of individuals or companies.

I've found that Wolfram Alpha offers a whole new kind of computation, what I would call "knowledge-based computation," where you don't just do computations, you start with a huge amount of built-in knowledge.

It's going to really change the economics of providing computing, whether it's on the Web or in any other form.

I'm in a really interesting situation right now.

On the one hand, you have Mathematica, a rigid formal language and a huge network of carefully designed features that allow you to accomplish so much with just a few lines of code.

Let me show you some examples

A very simple Mathematica program

We're combining a lot of features here.

In this line, we're adding a little bit of user interface, and you can do interesting things with it.

It's a slightly more complicated program that does all sorts of algorithmic things to create a user interface.

This is a very strictly defined

A rigorous specification is written in a rigorous formal language that tells Mathematica what to do.

Wolfram Alpha, on the other hand, incorporates the junk of the world, the natural language, and so on.

What happens when you put the two together?

Really great effect

Using Wolfram Alpha inside Mathematica, for example, you can create precise programs that use real-world data.

this is a very simple example

You can even give it ambiguous input and let Wolfram Alpha guess what you're thinking.

Give it a try [type spikey]

The most exciting thing about this is that it has the potential to make programming for everyone.

If you write what you want to do in ordinary words

Wolfram Alpha will be able to find the exact code to do it, and you'll be able to build larger and more accurate programs by letting you pick and choose what you need from the examples.

Sometimes Wolfram Alpha will do all of that immediately and return the program so you can run it.

This is a big website with a collection of demos that we can use for different kinds of learning and stuff.

let me give you an example

An example of a document that can be calculated

It's a tiny piece of Mathematica code that you can run on the fly.

back to the original story

Is there a general method that we can use to create technology based on our new kind of science?

When it comes to material things, we travel around the world to find specific substances that are useful for specific technical purposes.

It turns out that we can do the same thing in the computational universe.

An inexhaustible supply of programs

The hard part is how to fit it into people's purposes.

For example, rule 30 turns out to be a very good random number generator.

There are other simple programs that are good models of natural and social processes.

In fact, Wolfram Alpha and Mathematica contain a lot of algorithms that we've discovered in our exploration of the computational universe.

For example, this one, which explores the computational universe to find musical forms, is very popular among composers.

In a way, we can use the computational universe to mass-customize creativity.

I think that with Wolfram Alpha, we'll be able to routinely invent and discover on the fly, discovering all sorts of great things without going through the hands of engineers and evolutionary processes.

And this leads us to the ultimate question: can we find our physical universe somewhere in the computational universe?

Our universe may have very simple rules and even simple programs.

From the history of physics, we think the rules of the universe must be very complicated.

But in the computational universe, we've seen that very simple rules can produce very rich and complex behaviors.

Is it possible that something like that is happening in our universe as well?

If the rules of the universe were simple, they would have to be very abstract and low-level, operating well below the things like time and space that make things difficult to describe.

At least in some cases, the universe can be viewed as a kind of network, and when it's big enough, it behaves like a continuous space, just as a lot of molecules get together and behave like a continuous fluid.

Then the universe should evolve by applying a few rules and gradually updating this network.

And each possible rule corresponds to a candidate universe.

I haven't published this before, but here are some of the universe candidates I've been considering.

Some of this is hopeless, utterly barren, pathological with no concept of space or time, no matter.

But the exciting thing is that a few years ago, we discovered that even if we don't search very far into the computational universe, we'll find candidates whose differences from our universe aren't so obvious.

The problem is that any conceivable candidate for our universe is inevitably fraught with computational irreducibility.

It's extremely difficult to know how it really behaves, and therefore how it fits in with our physical universe.

A few years ago, I was very excited to find a candidate universe that could reproduce special relativity, general relativity, gravity, and even show signs of quantum mechanics with very simple rules.

Can we find the whole of physics?

I don't know for sure, but at least I think it would be a shame not to try.

not an easy project

We need to build a lot of technology

We'd have to build a system that's at least as deep as existing physics.

I'm not sure how best to organize the effort.

Are you building a team, are you going public, are you offering prizes?

But I'm here today to declare that I'm serious about that project, and in the next ten years, I'd like to see if we can reach the rules of our universe, where our universe is, among all possible universes.

And we'll be able to type into Wolfram Alpha what the ultimate theory of the universe is, and get an answer.

(Laughter) I've been working on the idea of ​​computation for over 30 years, building tools and methods, translating intellectual ideas into millions of lines of code and server farms.

Over the years, I've become more and more convinced of how powerful the idea of ​​computation is.

It has taken us far, but it will bring much more to come.

From the foundations of science and the limits of technology to the definition of the human condition, I have no doubt that computation is the idea that will shape our future.

thank you very much

(Applause) That was a great story.

I have a question for you.

(Applause) It was an amazing talk, to say the least.

Could you describe in a few words how this idea could be integrated with something like string theory, which is supposed to be the basis for explaining the universe?

The part of physics that we know to be true is something like the Standard Model. What I'm trying to do is to better replicate the Standard Model, and if I can't do that, I'm just doing it wrong.

What people have been trying for the last 25 years or so with things like string theory is an interesting quest to get back to the standard theory, but we're not there yet.

I suspect that some of the big simplifications I'm doing actually have a lot of resonance with what's been done in string theory, but this is complicated math, and we still don't know what it's going to look like.

In this audience is Benoit Mandelbrot.

He also showed how complex things can arise from simple things.

Do you think his work is related to yours?

i think it's related

I believe that the work of Benoît Mandelbrot has made a fundamental contribution to the creation of such a field.

He's particularly interested in nested patterns, or fractals, which are tree-like structures with big branches that make smaller branches that make smaller branches and so on.

This is one way to get to something really complicated.

I think things like rule 30 cellular automata take it to another level.

In fact, it's just a way to take it to another level, and it seems to me that we can create as much complexity as complexity can possibly reach...

We could go on and on about this, but let's stop. Stephen Wolfram, thank you very much.

(applause)

Hi, my name is Roz Savage, and I'm paddling across the ocean.

Four years ago, I crossed the Atlantic alone, and since then I've completed two of the three crossings of the Pacific, from San Francisco to Hawaii and from Hawaii to Kiribati.

Tomorrow we will leave here and return to Kiribati to begin the third and final leg of our cross-pacific journey.

Ultimately, one person will have to row more than 3 million times over 312 days in a rowing boat with a total length of 7 meters over more than 12,000 kilometers of sea.

This experience made my relationship with the ocean special.

Love and hate are mixed a little

It's a bit like how I used to feel about my very strict math teacher.

I didn't like it, but I respected it and learned a lot.

So today, I'd like to share with you some of my ocean adventures, what I've learned, and how I think they can be applied to the environmental challenges we face today.

Now, some of you may say, "I don't see you as someone who can paddle across the ocean."

Some of you may be thinking, "Isn't it only people like them who are this tall and wide enough?"

they have what i don't have

What are you thinking about? I'm talking about beards. No matter how long I've been at sea, my beards haven't grown and I hope they never grow back.

For a long time, I didn't think I could go on a big adventure.

I used to tell myself that adventures are like this

It was out of place for me

"Those people" and "us" are different, and I'm not a friend of "those people"

So for 11 years, I was just fitting in.

live a life that matches your background

I was working as a management consultant in an office in London.

I feel like I knew from the beginning that it wasn't the right job for me.

But this kind of psychological conditioning held me back for years, but in my mid-30s, I thought, "Okay, but I'm just getting older.

I feel like life has meaning, I don't know what it is, but I'm pretty sure it's not management consulting."

and in a few years

was changing some things

To find answers to the question of what to do with life

One day, I sat down at my desk and wrote out two versions of my obituary, one based on my adventurous life, and the other, the comfortable, normal, not bad life I was living at the time, but I didn't want it to end like that.

I wanted to live a life that I could be proud of.

I remember looking at the two death notices and thinking, "I'm on the wrong track.

If we keep going like this, we won't reach our ideal situation, even if five years pass, ten years pass, even if we're on the brink of death."

I made a few changes, left my old life behind, and, with a bit of a leap of logic, I decided to take a boat across the Atlantic.

(Laughter) The Atlantic Rowing Boat Race is about 5,000 kilometers from the Canary Islands to Antigua.

It's true that I wanted to step out of my comfort zone, but what I didn't really think about was that, of course, stepping out of my comfort zone would be very uncomfortable.

The timing wasn't great either, because I crossed the Atlantic in 2005, the year of Hurricane Katrina.

The North Atlantic had the most tropical storms ever recorded.

And from the very beginning, the storms started to hit

All four of my oars broke before I made it half way across the Atlantic.

It's not normal for oars to look like this

But I can't help it in the middle of the sea

oars are the only tools to move forward

In order to keep rowing, I had to look around the boat and figure out what to use to fix the oars.

So I found a boat hook and some heavy-duty duct tape, and splinted the boat hook to reinforce the oars.

When that too broke, I cut off the wheel axle from the spare rowing seat and used it.

After that, I dismantled one of the oars that had broken and used it.

When I was living in the old days, I wasn't good at repairing things, but when I'm in the middle of the ocean and the only way to reach land is to row, I'm amazed at how I can do it.

The oars have become something of a symbol of how we overcame our own limitations with various ingenuity.

I endured tendonitis in both shoulders and seawater sore buttocks.

The mental torment was so great, and I realized that if I kept going at 3 km/h, it would take me forever to reach 5,000 km/h, and I was completely overwhelmed by the scale of the challenge.

Time and time again I thought I was at my limit, but I had no choice but to keep going.

And finally, after 103 days at sea, we made it to Antigua.

I've never been so happy in my life

It felt like I'd run a marathon, been released from a prison cell, and won an Oscar.

I was full of happiness

I felt like a movie star when people came out to greet me and applaud me from the top of the cliff.

it was just awesome

And then I realized that the bigger the challenge, the bigger the feeling of accomplishment when it's over.

Now, I thought it would be good to take a moment and answer some of the most frequently asked questions about rowing in the ocean that you've been thinking about.

Most Frequently Asked Questions: What do you eat?

Try to eat more unprocessed foods with little or no freeze-dried food

For example, growing sprouts

Dried fruit and nut bars Eat lots of nuts

And lose nearly 15 kilos and reach the destination.

Question 2: How do you sleep?

Close your eyes Hahaha

I think you mean what happens to your boat while you sleep?

Plan your path ahead of time so that it can be swept away by the wind and currents while you sleep.

I've been lucky enough to go up to 18 kilometers in one night in the direction of travel.

The worst time was 21 kilometers in the opposite direction

Feels like a bad day at work

What are you wearing?

Mostly a baseball cap Rowing gloves and a smile or a frappe depending on if you went the opposite direction the night before Plenty of sunscreen too

Do you have an escort boat?

No, it's completely self-supporting at sea.

As long as I'm at sea, I don't see anyone

And finally: Are you crazy?

I'll leave this up to you to decide.

So what's your next transatlantic challenge?

It's normal to think about crossing the Pacific

But I thought the Atlantic was big, but the Pacific is really, really big.

I think the normal map is a little unfriendly

I don't know if the British really created this worldview, but I suspect it does because it's centered around the UK, even though they cut off the Pacific Ocean and pushed it to the other end of the world.

Here's what the Pacific looks like in Google Earth

Almost half of the earth is the Pacific Ocean

You can see a little bit of North America here, and this is the edge of Australia.

It's a huge area, over 150 million square kilometers, and if you traverse it in a straight line, it's over 12,000 kilometers.

But rowing boats rarely go straight

By the time we get to Australia, if we can get there, we'll probably have paddled about 14,000 to 16,000 kilometers.

So, since no sane person would leave Hawaii unanchored, I decided to divide this crazy project into three segments.

The first attempt in 2007 was the worst

I ended up doing overthrow exercises three times in 24 hours.

it was like being in a washing machine

The boat got a little scratch and I got a dent too.

I blogged about this, but unfortunately, someone with a bit of a heroism thought it was time to save this damsel in trouble.

When I woke up, there was a Coast Guard helicopter overhead.

I said it's okay

don't give up on the other side

I lost and was rescued

it was really miserable

One of the worst things I've ever done in my life, as I was winched up by a helicopter and looked down at my pretty, faithful boat being rocked by six-foot waves, and I thought, 'I'm sorry.

So we had to wait nine months for a very expensive salvage operation before we could sail again.

But what do you say?

Fall down and get up

So the next year I set out again, and luckily this time I made it to Hawaii safely.

But nothing happened

My water maker broke. It was the most important tool I had on my boat.

It's powered by solar panels, sucks up seawater, and creates fresh water.

It doesn't work well when submerged in seawater, but that's what happened.

But luckily I was able to help

Around the same time, there was another quirky boat doing the same thing as me, trying to raise awareness of the Great Pacific Garbage Patch, an area in the North Pacific about twice the size of Texas, with an estimated 3.5 million tons of garbage circulating around the center of the North Pacific Gyre.

So to appeal, they built a boat out of plastic waste, with 15,000 empty plastic bottles strapped to the floats on either side of the boat.

was going pretty slowly

I had a reason to be a little late.

Shortly after leaving Long Beach, the bottle cap came loose and I was about to sink, so I anchored at Catalina Island.

Because I had to re-tighten all the caps

But just as my reservoir of water was about to run out, the lanes crossed.

Food over there, I was running out of water

We communicated via satellite phone and arranged to meet.

And then it took about a week to really get closer.

I was going at a wretched 1.3 knots and they were a little better at 1.4 knots, like two snails doing a courtship dance.

But in the end, we were able to meet, and Joel came to my boat and caught an amazing dolphin, and it was my first meal in three months.

Luckily, the catch that day was better than this one they caught a few weeks earlier.

This fish was cut open and had a stomach full of plastic.

This is a very bad thing, because plastic is not an inert material.

The chemicals will leach into the bodies of the poor fish that eat this, and the next time we eat that poor fish, we will accumulate toxic substances in our bodies.

So it has an undeniable impact on human health.

Finally I survived and made it to Hawaii

And the next year, we set out from Hawaii to Tarawa, on the second leg of the Atlantic.

The first thing you notice about Tarawa is that the land is very low.

The small green line on the horizon is the tower. Residents are very worried about rising water levels.

it's a big problem for them

No land above 1.8 meters above sea level

Also, due to climate change, increased extreme weather events will cause more waves to enter over the reefs surrounding the islands and mix with the freshwater.

The president of Kiribati, whom I met there, told me about the country's withdrawal plans.

Within the next 50 years, 100,000 people living here will be forced to move to New Zealand or Australia.

And when I heard that, I wondered what I would think if Britain were to disappear under the sea, where I was born, where I went to school, where I got married, and it was all gone forever.

Literally how rootless would you feel? and

Soon I'll be leaving for Australia, and if I succeed, I'll be the first woman to paddle across the Pacific alone.

I want to use this to raise awareness of environmental issues and make people feel closer to the ocean.

If the Atlantic Ocean was an inward journey of discovering one's power, the Pacific Ocean might be an extrovert journey of thinking about how to use one's own interesting career choices to contribute to the world, and how to apply some of the things one learns at sea to situations in which humanity has found itself.

I think there are three important points in this.

The first is the self-view of the situation.

For the longest time, I told myself that I wasn't tall, I wasn't athletic, I didn't have a beard, so I couldn't have adventures.

But my opinion has changed

I learned that there was a person who paddled across the sea

The woman I actually met had the same physique as me.

And even though I didn't grow up or grow a beard, something about me changed, and the conversation I had with myself changed.

The general consensus among us today is that we need this, we need this, we need oil.

But what if we change that view?

We have other options, and we have the power of free will to choose those that are sustainable and create a greener future.

The second point is the accumulation of small actions.

You may think that no matter what you do on your own, you can't catch up, you can't change

No, this problem wasn't caused by a major disaster.

We've had the Exxon Valdez oil spill and the Chernobyl disaster, but mostly it's the accumulation of bad decisions made by billions of individuals day after day, year after year.

You can turn the tide as well

We can make better, smarter and more sustainable decisions from now on.

If we all do this, we won't be alone

spread as ripples

When you're in line at the supermarket and you pull out your reusable bag, other people will see it.

If everyone started doing the same thing, it might become socially unacceptable to get a plastic bag at the checkout.

this is just an example

it's a global community

The last thing is to take responsibility.

All my life I've been trying to get something to make me happy

I thought that if I had the perfect house, the perfect car, and the perfect boyfriend, I would be happy.

But when I wrote the obituary, I actually grew up a little bit and realized that I had to create my own future.

It's no use waiting idle for happiness to find me

You may be a selfish environmentalist,

I plan to live a long life, and I want to be healthy and happy when I'm 90.

But it's very difficult to be happy on a planet that has been overwhelmed by food shortages and droughts.

It's very difficult to stay healthy on a planet with polluted soil, oceans and air.

So I'm going to start a new initiative called "Eco Heroes" soon.

The idea is to have everyone, as eco-heroes, record one thing each day that will benefit the environment.

it feels like a game

I am planning to make an iPhone app.

I just want to raise awareness that changing a lightbulb might not change the world, but the attitude that leads to changing that lightbulb and using a reusable coffee mug will change the world.

I truly believe that we are now at a very important place in history.

We have choices, we have choices, we have luck or we have bad luck, we have free will.

We can choose a greener future, and if we all work together and paddle a little bit, we'll get there.

thank you

(applause)

The talks you've heard over the last few days were from people who have thought things through, and they're experts and they know what they're talking about.

You all know what I'm about to tell you

So you know what simplicity is, you know what complexity is.

I just don't know the problem

What I'm going to do next is to expose my ignorance on this subject.

Read this, I'll come back to it later

This quote is an opinion on pornography by the legendary Potter Stewart.

I read out the key points, "Hardcore pornography is shorthanded..."

"But you can see it when you see it."

I will come back to this later

Now what is simplicity?

It's good to start with an example

We don't think about coffee cups, but this is more interesting than you might imagine. Is a coffee cup a device? Jesus container? jesus do you have a handle? Jesus

Thanks to the handle, can you hold it even when it's full of hot liquids? Jesus

why is this important

For one thing, it allows me to drink coffee.

And because coffee is hot, it's pasteurized, so you can't get cholera from drinking coffee.

Coffee cups, cups with handles, are one of the tools society uses to maintain public health.

Scissors are used in your clothing. Glasses help you see better, so you don't get eaten by cheetahs or get run over by cars.

There are other simple things, which are also very important.

Simple function, not simple at all

these two are examples

One is a mobile phone, which is an everyday item.

It's built on complexity, and this complexity isn't what my friend Benoit Mandelbrot talks about, but it's very interesting.

On the other hand, contraceptives, which in a very simple way fundamentally changed the fabric of society, gave women reproductive options, changed their roles in society.

I think there are two ways of thinking about brevity.

I've tweaked the Potter Stewart quote as you can see, and this way it can be applied to a wide variety of things, from scissors to mobile phones to the Internet to birth control pills.

Another way of thinking about simplicity is from what moral philosophers call the teapot problem.

The teapot problem is like this

Suppose you have a teapot in front of you, and it's filled with hot water.

So you ask, why is it hot water?

it's a simple question

What is brevity? is a question similar to

The first answer would be something like this, because the kinetic energy of the water molecules is so high that the molecules are moving around so much.

The second answer goes something like this because it was on the stove with the fire on.

The third is because I wanted hot water for my tea, which is an intentional answer.

Since this question is for moral philosophers, the fourth answer would be that it is God's will.

These are all possibilities

The point is that if the answer column asks one question, it becomes a mess, because one question asks many questions in one phrase that makes a lot of sense.

The question of what is conciseness runs into this kind of problem.

what is the state of science

The interesting thing is that complexity has advanced a lot.

We're getting a lot of interesting information about complexity.

For some obscure reason, brevity is very little researched, at least in academia.

Academics - I'm an academic - like complexity.

You can write a paper about complexity, and the good thing about that complexity is that it's fundamentally unmanageable, so you're not responsible for the consequences. Simplicity, but you want your Waring coffee mixer in the morning to make what it's supposed to make, not explode and play Beethoven.

No one cares about the limitations of coffee blenders

What people are interested in has a deep connection with the benefits it brings.

And there are many benefits to thinking about complexity and emergence, not so much for simplicity.

One of the things I want to do is teach people how to deal with certain critical situations. I know you don't get to do that very often, but it's about how to spend time chatting next to a physicist at a dinner party. The words I want to draw your attention to are complexity and emergence.

(Laughter) So, in this way of looking at things, what is complexity, and what is emergence?

Complexity actually has a very practical definition.

It's a system that has components, like transportation.

Components interact with each other

It's the car and the driver, it consumes energy.

Something strange happens in such a system, and I'm sure you in Los Angeles know that better than anyone else.

So another example, I brought this up because it's an important example in modern science.

You can't read it.

It's kind of like the transportation system I mentioned earlier.

The amazing thing about cells is that they have relatively tight partnerships with other cells, and we don't know why.

Even those who have a deep knowledge of life will turn their backs.

Let's take this idea down to its simplest level.

We heard about Bill Gates the other day.

We all know to some degree about someone called Bill Gates.

That's great. You know all you can about him.

There's another person you might want to know, who might be more eager to know.

That's Bono This is Bono

If you knew everything there was to know about these two people, if you put them together, what would you say about it?

The answer is "nothing in particular"

this is the complexity

Now imagine taking this up to a city or a society, and you'll notice an interesting problem.

So let me give you an example of one particular kind of simplicity.

Now I'm going to introduce a word that I find very useful, the word stacking.

I'm going to use the word accumulation for that kind of brevity that's simple and reliable enough that you can build something out of it.

Or we use the word simple to mean reliable, predictable, reproducible.

I'll use the Internet as an example, because it's a particularly good example of stacking brevity.

We call the Internet a complex system, which it really is, but it's also something else.

Internet started with math, with binary

If you look at the list below, we're all familiar with the Arabic numerals from 1 to 10 and so on.

In binary 1 is 0001 7 is 0111

The question is, why are binary numbers simpler than Arabic numerals?

The answer is simply this: If I put up three fingers, you can easily count.

The beauty of binary is that it's the simplest way to represent numbers.

All other methods are more complicated than this

Using the binary system prevents mistakes The display is also clear The binary system has many advantages

So once you know how to read it, it's very simple.

Now, if you want to represent the binary 0's and 1's, you need some kind of equipment.

Think about the binary things in your life, one of which is a light switch.

The switch can be turned on and off This is binary

Wall switches, as we all know, fail.

About 50 years ago, our friend, a condensed matter physicist, invented a sophisticated device under that glass bell: the transistor.

A transistor is nothing more than a wall switch

It turns something on and off, but it does it without moving any parts, and it basically runs trouble-free for a long time.

The second layer of simplicity was the transistor and the internet.

Transistors were so simple that they could be put together.

When you put the transistors together, you get what's called an integrated circuit.

Today's integrated circuits will have about a billion transistors each in a chip like the one you see, all of which must work perfectly all the time.

This is the second layer of simplicity. Integrated circuits are extremely simple in that they work well.

Using this integrated circuit, you can make a mobile phone.

You're used to your cell phone working all the time.

Boston is a bit like Namibia in terms of cell coverage, but in Boston we're not used to having constant coverage, but not always.

Anyway, if you actually have a cell phone, you can visit this lovely lady in Namibia or somewhere, and even though she doesn't have a master's degree in electronics from MIT, she can hack cell phones and charge them in some interesting way, which makes her very happy.

Internet is next

This is a map showing traffic between continents

The two blurry lights in the middle are America and Europe.

So let's go back to simplicity again

I think this is one of the greatest ideas of Google.

Google claims that you can access all the information in the world through this simple portal.

The point here is that an extraordinarily simple idea is built on many layers of simplicity, which combine to create simple complexity, simple in the sense of being completely reliable.

So I'd like to end with four general remarks, one example and two maxims.

I think it's useful to think of these properties when thinking about simple things: First, it's predictable.

its behavior is predictable

One of the great qualities of simple things is that you generally know what it does.

So brevity and predictability are the qualities of simple things.

Second, this is a real-world thing, but it's cheap.

If something is out there that's cheap enough, someone will find a use for it, no matter how primitive it seems.

stone for example

You can build cathedrals out of stone, if only you knew what you could do with stone.

You carve blocks of stone and stack them on top of each other so you can support things.

So it has to have functionality, and that functionality has to be predictable, and at the same time it has to be low cost.

So it has to be high performance or cost effective.

The final component I would like to address is that it functions or has the potential to function as a building block.

That means you can stack

The stacking can be in this direction, it can be in this direction, or it can be in some arbitrary n-dimensional space.

If you have functionality and it's very cheap, people will find new combinations to make new things.

Something that's cheap, functional and reliable will unleash people's creativity, and they'll build things they never imagined possible.

It's very impossible to foresee the Internet from the first transistor.

just can't

These are the components

Now about this, I'd like to give you an example from what we're working on.

We're very interested in providing health care to developing countries, and what we want to do with this problem is to establish a way of doing medical diagnoses that costs as close to zero as possible.

how to do

A world with no electricity, no money, and no medical capabilities.

I don't want to waste time going into detail, but this one on the bottom right is an example of what we use.

this is a small piece of paper

Some are printed on this piece of paper using the same technique that makes comic books, and that's the technique that inspired this idea.

When urine is dripped on this

As you can see, it spreads like a branch.

won't need power

This will add color, and now we can diagnose renal function.

A lot of the medical workers in this world are 18-year-olds who carry AK-47s, can't find a job, and are willing to move around and do these kinds of treatments.

What we've done here is take a technology that can be used anywhere, and make a device that's extremely cheap, and we've made it in this very reliable form.

If we can make this attempt successful, if we can add more functionality, it will be stackable.

So, once you've established one or two basic techniques that work, they can be applied to people with a wide range of conditions, and thus can be scaled vertically and horizontally.

How can I put it politely? One of the aims in this matter is that I want to change or emasculate the American health care system, and I believe that that capitalization is fundamentally not working.

So... (Applause) Let me end with a couple of maxims.

One is from Einstein, who said that "everything should be as simple as possible", "but nothing simpler than that".

I think this is a very good way of thinking about the problem.

If you remove too much from something simple, you lose functionality.

It must be low cost, but it must not compromise functionality.

So it can't be overly simple.

The second is about design, not directly related to simplicity, but it's a good maxim.

by Saint-Exupery

"You know you've achieved the perfect design." "Not when there's nothing left to add." "When there's nothing left to take away."

This will definitely lead you in the right direction

Now, what can we do with the word brevity, which we've unraveled in this way? Rancuzy is out of scope, and why Mondrian is better, worse, or less simple than Van Gogh?

But the point is, on the one hand, to separate the reality of people who make things from the reality of people who think about things. And on the other hand, there's an intellectual advantage to asking the question: How do we make things as simple and cheap and functional as possible, and so that they can be combined at will?

If we can achieve this kind of simplicity with the technology that we have, and we can give it to you, you'll be able to do all sorts of amazing things with it.

thank you very much

(Applause) Chris Anderson (CA): I have a few questions.

So, do you think that when systems like the financial system, the legal system, the health care system, for whatever reason, are in crisis, or are crumbling, the science of simplicity can compensate for those systems, and is that the way to simplicity?

George Whiteside (GW): I think we can, and if we examine the components of that system for their vulnerabilities and their stability, maybe we can create some kind of risk assessment.

CA: Are you already working on that?

So you have a radical solution for the cost of the healthcare system, but what about the system itself?

GW: Hmmm no

What about this simple no answer

CA: That was a simple and powerful answer GW: Yes

CA: So about the diagnostic technology that you have, where and when will it spread?

GW: Very soon, because the system is working, so it's just a matter of how we're going to do the manufacturing and the activities.

CA: Regarding the establishment of the company, etc....

GW: It's a foundation. It's a nonprofit.

CA: I see. Thank you very much for your presentation.

If you go to the TED homepage today, you'll find over a week of videos, 1.3 million words of transcripts, and millions of user reviews.

It's really a huge amount of data

I saw it and thought, "If we can put all this data through statistical analysis, we can reverse engineer the TEDTalk.

I might be able to make the ultimate TEDTalk.”

(Applause) "And also the worst TEDTalks that can be tolerated."

To make sure of this, I looked at three things: the subject matter to choose, the way the talk was delivered, and how it looked on stage.

Now, you have a wide variety of subjects to choose from, but you have to choose wisely, because subject matter has a lot to do with how users respond.

To make things more specific, I've picked 10 words that are statistically common in the most liked and least liked Talks.

At TED, if you talk about the happiness that "French food" and "coffee" bring to "your" brain, you're guaranteed to succeed.

(Applause) On the other hand, if you're going to talk about a project involving "oxygen," "girls," and "airplanes," I'd love to hear it, but statistically it just doesn't work.

and

To generalize this further, the most popular TED Talks are those that we can easily relate to, such as happiness, the body, food, emotions.

Things like "architecture," "materials," and interestingly, "man" don't really make sense at TED.

How are you going to give your next lecture?

It's no secret that TED is very time sensitive, so if I tell you this, you'll probably get a bad look, but talk for as long as you can.

This is also true for individual ranking lists, with exceptions like "beautiful," "exciting," and "funny."

If that's what you're aiming for, keep it short, otherwise keep talking until you're pulled down.

(Laughter) And then…

(Applause) There are rules to follow when speaking.

I found this rule by taking statistics on four-word phrases that appear in each of liked and unliked Talks.

I'll give you three examples

First and foremost, as a speaker, you should tell your audience what you can offer and not say, "I can't."

Second, never quote "The New York Times."

(Laughter) Finally, and this is good news, I don't mind the speaker pretending to know.

When you don't understand, just say "etcetra et cetera"

everyone will come with me

No problem at all

(Applause) Now it's a matter of appearance.

The first thing you see on stage is the speaker himself.

According to our analysis, to join the ranks of the most liked speakers, grow your hair a little longer than average, don't forget to wear your glasses, and dress better than the average speaker.

Let's not just use slides, but also props.

And very important is the atmosphere of the stage.

color plays a very important role

Evaluation of lectures on websites is closely related to color

(Applause) For example, "attractive" talks statistically contain more purple than average talks.

Many "original" lectures are green... etc.

(Applause) I don't think I'm the first to do this kind of analysis, but I'll leave it up to you to decide.

So let's put all this together to create the ultimate TEDTalk.

We're at TED Active, so what we've learned from our analysis should be put into action.

I've got a tool, the TED Pad.

(Laughter) With this TED Pad, you can combine 100 specially curated texts to create your own TEDTalk.

There's only one decision to make, do you use the white version for a good Talk to talk about "creativity" or "human wisdom"?

Or you can go black and make a really bad TEDTalk and talk about "blogging" and "politics" and all that stuff.

Please download and try

I hope you enjoyed this session

Make Your Own Ultimate TEDTalk or Your Worst TEDTalk

And I hope that some of you will be inspired to give a talk like this at TED next year.

Thank you for your attention

(applause)

It's easy to see that I'm a petite Frenchman with a strong French accent.

What I'm about to tell you is mind-boggling, and you might already know it.

I'm sure many of you have donated to the people of Haiti this year.

And you, in a corner of your consciousness, are 25,000 people

You also know that children are dying from diseases that are completely preventable.

It's calculated that there will be an earthquake in Haiti once every eight days.

I'm sure many of you have donated to these children, but for some reason they don't do as well as they did in Haiti.

Why

I'm going to do a thought experiment

Let's say you have millions of dollars you've raised yourself, or you're a politician in a developing country, and you want to create a budget and spend it on the poor. How do you do it?

Are people right who say that spending more money will do the trick?

If someone who says they know how to end poverty say so, just increase aid?

Or are they right when they say that aid is useless, counterproductive, and fuels corruption and dependence?

Let's take a look at the results so far, after all, we've helped billions of dollars.

Looking back on past performance

whether it was good

sadly i don't know

Worst of all, there's no way to know the truth.

Take Africa for example

they have received tremendous help

indicated by a blue bar

Africa's GDP hasn't gone up that much.

What would it be like without help?

I could have been more depressed, or I could have been better.

Who knows what didn't actually happen

because there is no way to find out

so what should i do

Do you pray for help and see results?

Or are you just going to focus on your life and watch earthquakes keep happening every eight days?

The point is, if we don't have confidence that what we're doing is positive, what we're doing is no different than a medieval doctor treating leeches.

Patients may recover or die

Is it the leech or is it something else?

we don't know

let's ask another question here

It's a smaller issue than before, but it's not trivial.

Vaccination is the cheapest way to save a child.

So much money has been put into it all over the world. GAVI, the Gates Foundation have pledged a lot of money.

But every year, at least 25 million children don't get the immunizations they deserve.

It's the "last mile problem"

We have the technology, we have the infrastructure, but it's not widespread.

Now if you had a million dollar budget

How do you use it to solve this "last mile problem"?

And then there's another question: malaria. Malaria kills 900,000 people each year, most of them living in sub-Saharan Africa, mostly children under the age of five.

In fact, malaria is the leading killer of children under the age of five.

We know how to eradicate malaria.

Mosquito nets are very cheap to make.

For 10 bucks, we can produce and ship mosquito nets that are impregnated with insect repellent, and we can teach them how to use them.

Mosquito nets not only protect their users, but also have benefits against transmission.

If half the area uses mosquito nets, it benefits the other half because it stops the disease from being transmitted.

Even under such danger, only a quarter of children use mosquito nets.

The whole society should subsidize mosquito nets, distribute them for free, or even pay them to use them, because we can prevent contagion.

Some say, "Wait a minute!"

“If you distribute it for free, its value will not be communicated.

They won't use mosquito nets, and they may use them as fishing nets instead of mosquito nets."

so what should i do

Do you want to distribute it for free to increase the penetration rate, or make people pay for it so that they understand the value of the mosquito net?

What should I do now

The third question is about education.

As a solution to various problems To send children to school

What shall we do

Hire teachers and build more schools?

Do you prepare lunch?

It's full of things I don't understand

Now to the main topic

I can't answer if the help was helpful.

But I can answer these three questions.

We are in the 21st century, not the Middle Ages.

In the 20th century, randomized controlled trials helped us understand how drugs work, revolutionizing medicine.

Similarly, we can use randomized controlled trials for social policy.

The same rigorous scientific testing that we use for medicine can be applied to social innovation.

That way, you'll be able to see what works and what doesn't work against random policymaking, and why.

I'm going to show you how to do that with three practical examples.

Let's start with vaccination

Udaipur district of Rajasthan is a beautiful place

When I started working there, about 1% of the children were properly vaccinated.

It's a terrible situation, but there are places like that.

It's not that there's no vaccine. It's there and it's free. It's not that parents don't care about their children.

When an unvaccinated child gets measles, parents pay big bucks for treatment.

So village prevention centers are empty and hospitals are overrun with patients.

what's the problem

People who don't get it right are certainly part of the problem.

As in this country, there are many myths and misconceptions about vaccination.

In this case, too, it is difficult to resolve, because it is very difficult to persuade.

but there may be other problems

There may be a reason why you can't move

Imagine yourself as a mother of a child in the Udaipur district of Rajasthan.

You have to walk miles to get your child vaccinated.

If you get to the prevention center and it's closed, you'll have to go back the way you came.

If it's a problem, it's not hard to solve

First, it's easy to use. Second, it encourages everyone to don't procrastinate and act now.

It's a simple idea, but I wasn't sure if it was true or not.

so we

A randomized controlled trial was conducted in 134 villages in Udaipur.

Randomly selected blue dot village

The blue dots are easy to use, as I'll explain later.

In addition to that, the red dot villages have motivated them to act now.

White was the comparison, and didn't change anything.

Ease of access means that every month the prevention center went around the area to make it easier for children to get vaccinated.

As an incentive to act now, I decided to give away a kilo of beans for every vaccination.

1kg of beans is not a lot

You can't convince someone to do something they don't want to do with this amount.

On the other hand, if procrastination is your problem, you may be inspired to take action today.

As for the result

Before the experiment it was the same everywhere

This is the advantage of randomization

After the experiment, just the rounds -- just the rounds -- the vaccination rate went up from 6 percent to 17 percent.

Percentage of children who are fully immunized

It's good progress

Serving beans increased up to 38%

This is the answer

Making it more accessible and adding a kilo of beans can increase vaccination rates sixfold.

“I can’t give you beans all the time.”

some might say so

But economically, it's cheaper to give the beans than not to give them.

You pay the nurses anyway, so when you look at the cost per vaccination, it's cheaper to add a bonus.

what about mosquito nets

Should I give it away for free or should I sell it?

The answer depends on the answers to three questions

First, if I decide to sell mosquito nets, will anyone buy them?

The second question is whether people will use mosquito nets if I give them out for free.

The third is whether or not they will stop buying it in the future by giving it away for free.

And the third thing that's important is that if you get used to being given away for free, the market might suffer.

This debate has provoked a lot of emotional commentary.

It was more ideological than practical, but it was actually a simple problem.

The answer to this question is

Experimentation reveals

I've done a lot of trials, but the results are the same, so I'm just going to tell you about one experiment.

It's an experiment in Kenya, where we handed out discount coupons to people in Kenya.

With this coupon, you can get mosquito nets at the pharmacy.

Some people got free tickets, some people got 20% off tickets, some people got half price tickets, etc.

so you see the results

How is the purchase

And what happened was, if you were to buy a mosquito net, the adoption rate would be much lower.

So even with subsidies, $3 doesn't make a bed net, and only 20 percent of people get a bed net, which is bad because it lowers herd immunity.

The second is whether it will be used.

We found that people who had mosquito nets used them regardless of how they got them.

I will use it even if I get it for free

I will use it even if I buy it

from a long-term perspective

If you look at it, people who get a free bed net are given the option to buy a bed bed for two dollars a year later.

People who got it for free were more likely to buy a second one than those who didn't get it for free.

It's not that free offerings become the norm, mosquito nets become the norm.

maybe you need a little bit of trust in them

That's all for the mosquito net

You'd think I'd figured it out about vaccinations and mosquito nets.

But what politicians need is a wide range of options.

They need to know which of all possible means is the best way to reach their goals.

Let's say your goal is to get your kids into school.

There are many things that can be done, such as providing uniforms, waiving school fees, installing toilets, providing girls with sanitary napkins, and so on.

Which is best?

We believe that all are useful to any degree.

Is it okay to do something just because you have an intuition that it will work?

We obviously don't do that in business

Take freight transportation for example.

Before the canals were invented—before the industrial revolution in Britain—goods were transported by wagon

And the canals were built to carry 10 times more cargo than wagons could carry.

Should they have continued to use the wagon because they could still reach their destination?

If so, the Industrial Revolution would not have happened.

So why shouldn't social policy do the same?

In technology, we spend our time experimenting and fine-tuning to bring down costs, so why don't we do the same with social policy?

What the experiment can do is answer a simple question.

Let's say you have $100 that you can use for a variety of interventions.

How many years of education can you add by spending $100?

What I'm going to show you is what I've learned from various educational interventions.

The first thing that comes to mind is teacher availability School lunches Uniforms Scholarships

For $100, it's pretty decent, one to three years of education.

What doesn't work is the compensation for parents, who end up spending a lot of money because too many kids are in school.

here is the surprising result

Communicating the benefits of education can be done on a low budget.

If you spend $100 that way, you'll add 40 years to your education.

If you have parasites in your gut, where children live, get rid of the parasites.

$100 gives you 30 years of education

It's not intuitive, it's never been attempted, but it's a plan that actually works.

We need more information like this, and we need to use it to guide policy.

I started with a big question that I couldn't answer

I've broken it down into smaller questions, and I've found an answer to that.

It's a valid, scientific and powerful answer.

Let's go back to Haiti for a moment.

About 200,000 people died in Haiti, and the latest estimates put the number even higher.

People around the world have reached out to help, and in the last month alone, $2 billion has been donated -- that's $10,000 per victim.

It doesn't feel like a lot of money

If we were to spend $10,000 on every child who dies before the age of five, this problem alone would raise $90 billion a year.

but it doesn't come true

Why

I think the problem in Haiti is big, but it's localized and easy to understand.

Donate to Doctors Without Borders, donate to Partners in Health, and they'll send in doctors, they'll send in timber, they'll ship supplies in helicopters.

The problem of poverty doesn't work like this.

First, most of it is invisible, and second, it's too big, and we don't even know if we're doing the right thing.

There is no decisive factor

Helicopters couldn't lift people out of poverty.

it's very irritating

See what we did today

We presented three answers to three questions: handing out beans at the same time as immunizations, providing mosquito nets, deworming.

For $300, you can get a vaccination and use a mosquito net to save one life.

For three dollars, you can get rid of the parasites and get an extra year of education.

Even if poverty cannot be eradicated immediately, it will be effective.

you can start small

I'll give you an example of how powerful this is.

extermination of parasites

Parasites are enough to be a newspaper article

Not eye-catching

But when the young men of Davos found out about that information, they formed a parasite control group.

Through the work of that organization and the efforts of governments and foundations in many countries, 20 million children were dewormed in 2009.

the evidence is solid

have the power to inspire action

we should act now

it won't be easy

It is steady work

You have to keep experimenting, and sometimes you have to beat the theory with practice.

You have to change your approach depending on where you are.

It's a very slow process, but there's no other way.

This economics that I'm proposing is like 20th century medicine.

It's a discovery made after slow deliberation.

There's no miracle cure, but modern medicine saves millions of lives every year, and we can do it too.

Now maybe I can go back to the big question I asked at the beginning.

I can't say if the aid we've spent in the past has made a difference, but 30 years later, I can come back and say, "Well, what we did was good!"

I believe in its possibility and realization

thank you

(applause)

How do you explain when things go wrong?

Or how do you explain it when someone does something that turns all conventional wisdom on its head?

For example, why is Apple so innovative?

Year after year, we continue to be more innovative than any of our competitors.

But it's still a computer company.

Similar to other companies

We bring the same people together, we use the same agencies, the same consultants, the same media.

So why does Apple seem to have something different?

Why Martin Luther King was able to lead the civil rights movement

He wasn't the only pre-Civil Rights America to suffer, and he wasn't the only great public speaker.

Why Master King

Why were the Wright brothers able to do powered, manned flight? No other group, with the talent and the money, could do it, and the Wright brothers lost out.

something else is at work

Three and a half years ago, I discovered

This discovery has completely changed the way I see how the world works, and it has completely changed the way I interact with the world.

What has become clear is a pattern

It turns out that all great, inspiring leaders and organizations, whether they're Apple, Martin Luther King, or the Wright brothers, think, act, and communicate in exactly the same way.

And that's the exact opposite of how other people do it.

I formulated it, which may be the simplest idea in the world.

i call it the golden circle

Why? How?

What? This little idea can explain why some organizations and leaders are empowered like no other.

Let me briefly define the term

Anyone in the world, any organization, knows what they're doing, 100% everyone.

Some people know how to do it, you might call it a differentiating value proposition or a unique process or a unique selling point.

But people and organizations who know "why they are doing it"

Very little. Profit isn't the answer to the why.

it's the result it's always the result

When I say "why," I'm asking purpose.

For what? What do you believe?

What is the reason for the organization's existence?

What do you wake up in the morning for?

Why is it important?

In fact, the way we think, act, and communicate is from the outside in.

That's right, it goes from the clear to the vague.

But the best leaders and the best organizations, regardless of size or industry, move from the inside out when they think, act, and communicate.

Let me give you an example

The reason why I use Apple products is simple and easy for anyone to understand.

If Apple were like any other company, they'd make a commercial that said, "Our computers are great.

Beautifully designed and easy to use User friendly

How about one?" No need.

most of us say

So is marketing and pitching, and most of our conversations are like that.

We tell them what we're doing, how we're different and how we're better, and we expect them to do something, like buy or vote, we've opened a new law firm.

We have the best lawyers and big clients We always put our clients first

This is our new model of car Low fuel consumption Leather seats How do you like it?

this doesn't move me

Here's what Apple would say

"Everything we do, we do it with the belief that we can change the world.

I believe there is value in thinking differently.

The way we change the world is through beautifully designed, easy to use and approachable products.

That's how we got a great computer."

Would you like one?

Not at all, right? Would you like to buy it?

What I just did was reverse the order of the information.

What this shows is that people are driven not by what, but by why. People are driven by why, not by what.

That's why everyone in this room is comfortable buying a computer from Apple.

And you can also buy MP3 players and smartphones and video recorders from Apple with confidence.

But Apple is just a computer company.

It's not like Apple works any different than any other company.

Competitors have the ability to make similar products

I've actually tried

A few years ago, Gateway came out with a flat-screen TV.

Gateway has great technology for that

We've been making flat screen monitors for PCs for years.

but it didn't sell at all

Dell launched an MP3 player and a PDA. Very high quality. Nice design. But it didn't sell at all.

In fact, nowadays, you can't even imagine buying a Dell MP3 player.

Who is a computer company's MP3 player?

But everyone buys from Apple

People are driven by the “why,” not the “what.”

Instead of doing business with people who need what you have to offer

Your goal should be to do business with people who believe what you believe.

Most importantly, what I'm talking about is not my opinion.

It's all based on biological principles.

It's biology, not psychology

If you look at a cross-section of the human brain from above, you can see that the brain is divided into three main parts, which correspond to the golden circle.

The newest Homo sapiens brain is the neocortex, which corresponds to the "what" level.

The neocortex is responsible for rational, analytical thinking and language.

The inner two correspond to the limbic system, which governs emotions, trust, and loyalty.

It controls human behavior and makes all decisions, but it has no language.

In other words, when you're communicating from outside to inside, you can certainly understand a lot of complex information -- features, benefits, facts, numbers.

but does not lead to action

When you're communicating from the inside out, you're communicating directly with the part of the brain that controls your behavior, and you can reason later, either by your words or by your actions.

Intuitive Decisions Start Here

Sometimes, even when I give all the facts and data to someone, they say, "I know the details, but I don't think I'm convinced."

Why is it "feeling" here?

The reason is that the decision-making part of the brain cannot handle words.

At most, it is a word that says, "I don't know, but I don't have a convincing 'feeling'."

Sometimes I say it's one thing in my heart, or I follow the guidance of my soul

But I don't make decisions outside of my head.

Everything happens in the limbic system, which is responsible for decision-making, not language.

People respond to "why are you doing it?" and if you don't know why you're doing it, whether it's to vote for you or buy you something, it's not going to attract people, and it's not going to make them want to join you in loyalty to what you're doing.

Instead of selling your product to people who need it, you should aim to sell it to people who believe what you believe.

Instead of hiring people who just want a job, you should aim to hire people who believe in what you believe in.

I always say that if you hire someone just because they can do the job, they will work for your money, but if you hire someone who believes in what you believe in, they will work for blood and sweat and tears.

There's no better example of this than the Wright Brothers.

Most people don't know about Samuel Pierrepont Langley.

At the beginning of the 20th century, the pursuit of manned powered flight was like today's dotcom.

everyone was trying

And Samuel had a recipe for success.

Let's say you ask someone, "What made your product or company fail?"

The answer is always the same three things: lack of funds, lack of talent, and the deterioration of market conditions.

It's always these three points Let's take a closer look

Samuel Pierrepont Langley was given $50,000 in funding from the War Department to develop a flying machine.

money is fine

He was at Harvard and worked at the Smithsonian Institution, so he was well-connected, he was in touch with the minds of the time.

We used money to attract the best talent, and the market environment was excellent.

The New York Times followed him around and everyone was rooting for Langley.

So how come you haven't heard of Samuel Langley?

Hundreds of miles away in Dayton, Ohio, the Wright brothers Orville and Wilbur had no recipe for success.

We don't have money to challenge our dreams We take the money out of our bike shop

None of the Wright brothers' team had a college degree, nor did Orville and Wilbur.

And I won't be chased by the New York Times

What was different was that Orville and Wilbur were driven by causes and ideals and beliefs.

They believed that if they could build this flying machine, it would change the world.

Samuel Langley was different

He wanted wealth and fame

The goal is what you get from it

I was looking for wealth

and what happened

The people who believed in the Wright brothers' dream worked together through blood, sweat and tears.

the other team just works for the paycheck

The Wright brothers say that every time they went out for testing, they took five sets of parts with them, because they kind of broke about five times by the time they got home for dinner.

And finally, on December 17th, 1903, the Wright brothers made their first flight, and no one was there to witness it.

It wasn't until a few days later that it was widely reported.

And further evidence that Langley's motives were inadequate, he gave up on the day the Wright brothers flew.

He could have said, "They did a good job. Why don't we make it better?" But he didn't.

He couldn't be number one, he couldn't be rich, he couldn't be famous, so he gave up.

People are driven by the “why,” not the “what.”

And if you talk about what you believe, you'll attract people who believe it.

So why is it important to attract people who believe in your beliefs?

There's something called the law of diffusion of innovation, so if you don't know it, learn the term.

2.5% of the population are innovators

13.5% are what we call early adopters

34% are early majority, late majority, followed by laggards

The reason these people buy touch-tone phones is because they can no longer buy dial-type phones.

(Laughter) We're all at different points on this axis, and the law of diffusion of innovation tells us that if you want mass market success, or if you want your idea to be widely accepted, you need a tipping point of 15 to 18 percent market penetration.

I often ask, "How many new business conversions?"

The other party proudly tells me "10%"

Yeah, you can get to the point where you have 10 percent of your customers, and you have about 10 percent of people who jump on you.

I can only say so

they just jump on instinct

The problem is people who jump at you without selling

It's the difference between people who don't eat

It's a matter of how you fill that little gap here, Jeffrey Moore, what you call "crossing the chasm," because the early majority will only be willing to try after someone else has tried first.

Innovators and early adopters are people who follow their instincts.

They like to make intuitive decisions based on what they believe about the world, no matter how hard it is to obtain.

People standing in line for six hours to buy an iPhone the day it came out, when the next week they could walk into the store and buy it on the spot.

These are the people who will pay $40,000 for the first flat-panel TV, even if the technology isn't standard yet.

By the way, they don't do it because the technology is great, they do it for themselves.

I want to be the first

People are driven by the why, not the what, and they simply act out what they believe.

people act to show what they believe

The reason they stand in line for six hours to buy an iPhone is because of what they believe about the world.

People are driven by the “why,” not the “what.”

So here's a famous example: a famous failure and a famous success of the law of diffusion of innovation.

The first is a famous failure.

This is an example of a product

As I said a moment ago, the recipe for success is money, talent and market conditions.

If you have this, you will succeed

Check out TiVo

TiVo came out 8-9 years ago and was the only high quality product on the market, absolutely no mistake.

Fundraising went very well

Market conditions were also excellent

TiVo is now a verb

I'm always on TiVo with "Sugo roku"

But it was a commercial failure.

I couldn't make money

The stock was 30-40 dollars when it went public, and then plummeted and never traded above 10 dollars.

In fact, I don't think it's even traded above $6, apart from a few sporadic spikes.

You see, when TiVo launched the product, they explained what it was.

"It's a TV that lets you pause live, skip commercials, rewind, and it remembers what shows you like without asking."

The skeptical public thinks, "I can't believe

I don't want that, I don't like it

It's creepy."

If TiVo were to say something like, "If you want to control every aspect of your life, here is the product for you.

Pause live broadcasts, skip commercials, remember favorite shows, etc.”

People are driven not by what, but by why. What we do matters only so long as it shows what we believe.

Now let's look at an example of how the law of diffusion of innovation worked.

In the summer of 1963, 250,000 people packed the streets of Washington to listen to Dr. King's speech.

No invitation sent, no website to announce the date

how did you do it

Dr. King wasn't the only great public speaker.

He wasn't the only one to suffer in pre-civil rights America.

In fact, some of his ideas were terrible.

but he had a talent

He didn't preach what it takes to change America

he said what he believed

Said "I believe I believe I believe"

People who believed what he believed made his motives their own and passed them on to others.

Some even formed organizations to reach out to more people.

And wow, 250,000 people turned up that day, at that time, to listen to him.

How many of them gathered for Dr. King?

is zero

all gathered for themselves

They traveled eight hours on a bus and gathered under the scorching heat of August in Washington for what they believed in America.

It's for what I believe in. It's not a white-black conflict. Twenty-five percent of the audience was white.

King believed that there are two kinds of laws in this world: laws made by God and laws made by man.

And they believed that the world would not be just until all man-made laws were aligned with the laws of God.

The civil rights movement just happened to be the perfect tailwind for his life's purpose.

It was not for him that people followed, but for themselves

In it, I gave the "I have a dream" speech, not the "I have a plan" speech.

(Laughter) Compare that to the modern politician's 12-point grand plan.

it doesn't move anyone

There is a difference between a leader and someone who guides

A leader is someone who holds a position of authority or power, but a leader moves people.

Whether it's an individual or an organization, we follow those we lead, not because we have to, but because we want to.

Follow those who guide you, not for them, but for yourself.

And those who start with the "why" have the power to inspire others and find others to inspire them.

thank you very much

(applause)

I've been playing at TED for nearly a decade, but I've rarely played a new song of my own.

Well, it's just that there weren't any new songs.

(Laughter) Lately, I've been busy with projects, one of which is the Nutmeg.

A lifeboat from the 1930s, restored in the garden of my seaside home in England.

So even if the Arctic ice cap were to melt, my studio would be able to sail out of a world that rises and sinks like an ark, like a JG Ballard novel.

During the day, the Nutmeg collects energy from solar panels on the wheelhouse roof and a 450-watt windmill on the mast.

By the time it gets dark, a lot of electricity is stored

You can light up the Nutmeg like a lighthouse.

So I'm stuck there until dawn, working on a new song.

Now let's play, you'll be the first to hear this song.

(Applause) It's a song about Billie Holiday.

That's right, one night in 1947, she slipped out of physical space and didn't come back all night. She reappeared the next morning.

i know where you been

she was with me on this ship

was very sexy

(music) Billy slips softly into my sleepless arms Warm like a mouthful of sour mash Like a strange fruit Cute bastard Backstage at Carnegie Hall There's a fuss "Famous jazz singer cancels" Looks like he's disappeared from the building My body and mind creak tonight on the piano chair 'Cause the moon is the only witness I can hear her breathing "This time it's for love" But love is a loaded pistol before dawn She's gone Across the frozen river Home I see a new era with Johnnie Walker Alone I want you with me again tonight Billy Time is a tough magician Still echoes in my heart "This time for love" (Applause)

In order to talk about the TED wish, I wanted to first try to sort out what I was trying to do and how it fits into the TED effort.

We live in a world that is notoriously interdependent, but it falls short in three main ways.

First of all, big inequalities: Half the world's people still live on less than $2 a day, 1 billion people have no clean water, 2.5 billion people have no sanitation, 1 billion people go to bed hungry every night, 1 in 4 people die each year from AIDS, tuberculosis, malaria and sewage-borne diseases, and 80% of the victims are under the age of 5.

Rising inequality is not uncommon today, even in rich countries.

In the United States, after five years of economic growth since 2001, five years of increased productivity in the workplace, median wages remained unchanged and the number of working households living below the poverty line increased by 4 percent.

Working households without medical insurance increased by 4%

In this interdependent world, where most of us are blessed, which is why we work in Northern California and enjoy this evening, it's a very unequal world.

Then there is the instability

The sources of instability are the threat of terrorism, weapons of mass destruction, a global epidemic of disease, and the feeling that we are more vulnerable to it than we were just a short while ago.

And perhaps most importantly, climate change, resource depletion and species destruction make the world unsustainable.

The world I want to leave for my daughters and future grandchildren is one that moves from unequal, precarious and unsustainable interdependence to a harmonious community, locally, nationally and globally, a community that shares the hallmarks of all successful societies;

None of this is easier said than done

A few years ago, there was a terrorist attack in England, and even though it didn't take as many lives as the 9/11 attacks, I think the thing that most disturbed the British was that the perpetrators were locals, not outsiders.

So they thought that their differences were more important than their common humanity.

This is mankind's dominant psychological ailment in the 21st century

In all of this, those of us who don't hold public office have the greatest power ever to do good, because the majority of the people in the world can elect governments and vote them out of office.

And even undemocratic governments are more sensitive to public opinion than they used to be.

Largely because of the power of the internet, people with little means can band together to raise huge sums of money that can change the world for the common good.

America donated $1.2 billion when the tsunami hit South Asia.

30% of households donate

half of it was over the internet

The median donation was about $57

and thirdly by the increase in non-governmental organizations

Non-governmental organizations, businesses, and other civil society organizations have tremendous power to influence the lives of others.

When I became president in 1993, there was no such organization in Russia.

now there are hundreds of thousands

India was zero, but now there are at least half a million active.

China had zero, and now there are 250,000 that are registered with the government, and there are probably double that number that are not registered for political reasons.

When I started the foundation, I was thinking about the world as it is and the world I want to leave for the next generation, and I tried to be realistic about the things that have always interested me and that I could still have an impact on.

I would like to focus on activities that help alleviate poverty, fight disease, combat climate change, and bridge the religious and racial divides and other gaps that plague the world, but I want to do so in a way that changes the way public service functions are performed, using whatever special skills we can bring together within us, so that we can spread them around the world.

That's one of the things we've been able to do with AIDS drugs.

Ira magazine is here, the leader of the AIDS effort and the person who is most active in the wish that I'm going to talk about tonight.

There it is

(Applause) When I left public office and was first asked to help respond to the AIDS crisis in the Caribbean, generic drugs were selling for about $500 a year per person.

You can get it for just under $400 if you buy in bulk.

The Bahamas, the first country to act, paid $3,500 for this drug.

The market was in such chaos that the two companies I bought the drug from were cheating out of seven times the money.

So we got the price down to $500 for the first week of operation.

Suddenly, for the same amount of money, you could save seven times as many lives.

We then reached out to the manufacturers of AIDS drugs, one of which was mentioned in the video, and we negotiated to change their business strategy because the drug was being sold at $500 with high margins, low volumes, and unclear payment terms.

So we worked to improve the productivity of our operations and supply processes, and we turned it into a low-margin, high-capacity business with absolutely reliable payment standards.

He joked that his main contribution to the AIDS response was getting manufacturers to change their strategy from jewelry stores to grocery stores.

But the price went from $500 to $140.

Soon the average price was $192

currently available for about $100

The pediatric drug was $600, but it's way too expensive.

Negotiated down to $190

Then, France came up with the brilliant idea of ​​imposing an air ticket tax, which led to the creation of something called Unit Aid, with the help of many countries.

Now pediatric medicine is $60 a year per person.

The only thing that prevents us from saving the lives of people who need medicine to live is the lack of systems necessary to diagnose, treat, care for, and get this medicine to patients.

We started the Childhood Obesity Initiative with the American Heart Association.

We've tried to do the same by negotiating deals with the soft drink and snack food industries to reduce the calories and dangerous content of the food that children eat in school.

they simply reorganized the market

So the idea came to me that we need to organize a market for public goods in this anarchic world.

And that's what we're going to do now, working with a group of big cities to fight climate change, and we're going to make a very big deal that will enable these cities, which produce 75 percent of the world's greenhouse gases, to significantly and quickly reduce their greenhouse gas emissions in a good economic way.

I don't understand the argument that reducing greenhouse gas emissions is some kind of financial burden.

I think it's easy

When Al Gore won a well-deserved Oscar for his movie "An Inconvenient Truth," I was thrilled and urged him to make a second one immediately.

For those of you who've seen "An Inconvenient Truth," the most important part of Gore's talk is the final scene, which shows the evolution of greenhouse gases if nothing is done, and the evolution that is possible.

And I've categorized six things we can do to change trajectory.

We need a film about those six measures.

And everyone has to keep that in mind and prepare accordingly.

we are working to make it happen

So sorting out these markets is one of our attempts.

I'm currently working on the second thing, and this is my wish.

From my experience working in developing countries, the media may be pessimistic and say that they can't do this, they can't do this, that it's because of corruption, but I think that in poor countries, powerlessness is a much bigger problem than corruption, and that's what fuels corruption.

At those low prices, there is money around the world to distribute AIDS drugs to people who can't afford them right now.

Today, these low prices are available in a total of 62 countries, including 25 in which we operate, benefiting about 550,000 people.

I have funds to deliver to other people.

It means that there is no system to deliver them

First, in Rwanda, then in Malawi and elsewhere. But tonight, I want to talk to you about Rwanda. So what we've been trying to do is create a model of health care in very poor rural areas that can be used to address AIDS, tuberculosis, malaria, other communicable diseases, maternal and child health, and all kinds of health problems facing the poor in the developing world.

The first criterion is

the ability to provide quality care

Secondly, will the country do so at a price that will allow it to sustain its health care system in five to 10 years without foreign funding?

Because the longer we've been working on these issues, the more convinced we are that we have to build systems, whether it's the economy or health or education.

The lack of a working system breaks the connection that brought you here tonight.

If you think about any life, no matter how many obstacles you've faced, you've always found that at critical junctures, there is a predictable link between your efforts and the results you can achieve.

In a chaotic, systemless world, everything becomes guerrilla warfare, and this lack of predictability.

And saving lives, educating children, developing the economy, all of this becomes nearly impossible.

I believe that Dr. Paul Farmer has done the best job of building systems in the field of health care in very poor communities. He's worked with Partners in Health, as many of you know, for the last 20 years, primarily in Haiti, where it started, but also in Russia, Peru, and many other places around the world.

Haiti is poor, and the areas in which Dr. Farmer's clinic operates, which usually cover a much larger area than the medical profession would allow, haven't lost a single person to tuberculosis since 1988, not a single one.

Other impressive health achievements

So when we decided to go to Rwanda to fight AIDS by exponentially increasing the country's income, our goal was to build a health care network, because it completely collapsed during the 1994 genocide, and per capita income was still below one dollar a day.

So I called Paul Farmer and asked him if he could help me.

Because if we could prove that we had a model in Haiti or Rwanda that could encompass whole nations, it would be great, firstly, for the most suffering country on the planet for the last 15 years, and secondly, we would have something that could later be adapted to the poorest countries of the world.

So we set out to implement

And a year and a half ago, we started working together.

We work in an area called Southern Kayonza, which was one of the poorest areas in Rwanda and was originally home to about 400,000 people.

Essentially, we're doing what Paul Farmer did in Haiti: developing and training local paid health workers to identify health problems, ensuring that people with AIDS and tuberculosis are properly diagnosed and taking their medications on a regular basis, working on health education, clean water and sanitation awareness, providing nutritional supplements and addressing critically ill patients with special needs.

The procedures to make this work, as I said, have been perfected by Paul Farmer and his team over the past 20 years in rural Haiti.

recently evaluated its first year-and-a-half effort in Rwanda

The results have been so good that the Rwandan government has now agreed to introduce this model across the country, and the overwhelming support has resulted in devoting the maximum resources of the government.

I'd like to tell you a little bit about the team, because it represents what we do.

There are about 500 people working in the AIDS response around the world, and some of them are working for free, receiving only transportation, room and food.

Others are active in related programs.

Our business plan in Rwanda was put together under the direction of Diana Noble, who is a very talented woman, and that's what a lot of people are willing to do in this kind of activity.

She was the youngest co-founder of Schroeder Ventures when she was in her 20s

After being the CEO of a successful eVentures, I founded Reed Alzevia Ventures, and at 45, I wanted to do something different with my life.

She's now doing this full-time for a modest fee.

She and a team of former business people have developed a business plan that will allow us to scale this health system across the country.

And this would be as valuable as the high-paying private equity work she was doing.

When we came to this rural area, 45 percent of children under the age of five were stunted due to malnutrition.

23% died before reaching the age of 5

Mortality at birth was >2.5%

More than 15% of deaths in adults and children were caused by intestinal parasites and diarrhea from dirty water and poor sanitation, all preventable and treatable.

More than 13% of deaths were due to respiratory diseases, all of which are also preventable and treatable.

And there was no treatment for AIDS or tuberculosis in this area.

I'm going to tell you what happened in the first year and a half, going from zero to 2,000 people on AIDS treatment.

That's 80% of the people in the area who need treatment.

Remarkably, less than 0.4% of those treated stopped taking their medication or neglected treatment.

This is lower than the number in America

Less than 0.3% had to switch to a more expensive second-line drug

400,000 pregnant women will be counseled and give birth in a well-equipped health system for the first time

This is about 43% of all pregnancies

I mentioned 400,000 pregnant women earlier, but the correct number is 40,000.

About 40 percent of the total population that needs treatment for tuberculosis is currently receiving treatment, compared to zero just 18 months before we started.

43% of children who need infant food stamps to prevent malnutrition and premature death are now receiving the food they need to survive and thrive.

The location has launched its first malaria treatment program

The hospital where the patients are housed was in a state of destruction during the genocide, but along with four other clinics, we restored it, installed a solar-powered generator, and installed advanced technology in the lab.

Nearly 100 percent of AIDS patients are now being treated at home, and now we're treating 325 people a month.

And most importantly, because Paul Farmer's model was implemented by local health workers, we estimate that this system could be implemented across Rwanda at 5% to 6% of GDP, and in the next five to six years the government would be able to sustain it without relying on foreign aid.

Those of you who know the economics of health care know that all rich countries spend between 9 and 11 percent of their GDP on health care, and the United States spends another 16 percent on health care, but that's another time.

(Laughter) We're currently working with Partners in Health, the Ministry of Health in Rwanda, and our foundation to scale up this system.

And we're about to start doing this in Malawi and Lesotho.

And we're doing similar projects in Tanzania, Mozambique, Kenya, Ethiopia, with other like-minded partners, to save as many lives as quickly as possible, but in a systematic way that can be implemented nationally, and later as a model that can be implemented in every country in the world.

First, we need to make an upfront investment to train doctors, nurses, health administrators and community health workers across the country, to build information technology, solar energy, water and sanitation, transportation infrastructure.

But over a period of five to 10 years, we'll reduce the need for external help and eventually phase it out.

My wish is that TED will help this effort to build a quality rural health care system in poor Rwanda that could serve as a model for Africa, and indeed for other poor countries around the world.

I believe this will help build a more integrated world, with more partners, fewer terrorists, more productive residents, fewer haters, a place that we all want our children and grandchildren to grow up in.

It is a particular honor for me to work with Tom Hunter, a Scottish philanthropist, in Rwanda, where we are also working on a major economic development project that has reduced the cost of fertilizers and interest rates on microcredits by 30 percent, in the same way that AIDS medicines have been used, and increased crop yields for farmers by 300 to 400 percent.

They've been through hard times, but when they were trying to destroy each other, no one, especially me, helped them, and we're doing it now.

Trying to counteract, they're really overcoming the past and focusing on the future.

We do this in an environmentally responsible way.

They're doing their best to persuade them to use clean energy instead of running grids for the 35 percent without electricity. They're doing a decent reforestation project.

When I visited some men who were farmers in the South, one of the first things I did was get down on all fours and dig to see how the soil was.

A nation that had nearly destroyed itself to genocide now has a chance to reconcile, reorganize, focus on tomorrow, and prove that it can provide comprehensive, quality health care with little help from the outside.

It's an honor to receive the TED Prize, which helps build a health care model.

I wish I had a little more help to make that happen. Just think about the consequences: If a country with a per capita income of less than a dollar a day, Rwanda, or any other country on the planet in a similar situation, had a world-class health system, hundreds of millions of lives could be saved in the next decade.

It's worth a try and I believe it will work

thank you

(applause)

I'm an ecologist, mainly in coral reef ecology.

I started in the Chesapeake Bay, dived into winter waters, and overnight became a tropical ecologist.

It was really fun and lasted about 10 years

Because I got other people to fund me and I traveled around and explored some of the most beautiful places on earth.

that was my job

And then we ended up in Jamaica, where in the West Indies, the reefs are truly extraordinary, structurally unlike anything you've ever seen before.

Here's a picture, which is pretty interesting, and it shows two things. First, it's a black-and-white picture. The water was so clear that you could see very far.

Another thing this photo shows is that there are no fish in this beautiful coral forest.

Jamaica's Discovery Bay coral reef is the most studied coral reef in the world for 20 years.

we are the best

They were coming from Australia to study our corals, and it's kind of funny, now we're going to them.

Academics' insight into how coral reefs work and how they should be is based on these corals, without the fish.

In 1980, Hurricane Allen hit

I evacuated half the lab to my house.

A fierce wind blows

The waves were 25 to 50 feet high.

The corals disappeared and new islands formed, and I thought, "We're smart.

We know there have been many hurricanes in the past.”

And he published a paper in Science, which was the first time a researcher had discussed the destruction of coral reefs caused by a major hurricane.

I predicted what would happen, but it was all wrong.

The reason was overfishing and the death of the last ubiquitous herbivore, the sea urchin.

Within a few months, seaweed began to grow after the sea urchins died.

This is the same reef, this is the same reef 15 years ago, and this is what it looks like today.

A few percent of the coastal reefs of Jamaica's north have live coral, mostly seaweed and sludge.

This is the story of coral reefs in the Caribbean, and, tragically, it's happening to coral reefs around the world.

It's a little disturbing story that I know

All of us in the '60s and '70s have similar heartbreaking stories.

There are tens of thousands of such stories, and it's very hard to recall the happiness, because things just keep getting worse.

What makes things worse is that after a natural disaster, say, a hurricane, there used to be a continuum of resilience.

I'm going to go through each one in turn and talk about these three points.

We hear a lot about cod stocks collapsing.

It's hard to imagine, but some historians believe that the three colonial world wars were aimed at controlling cod stocks.

Cod is the food of most Western Europeans.

It was given to slaves brought to the Antilles, and the song "Farewell to Jamaica" says, "Ackee rice and salted fish is good."

Everything fell apart in the 80's and 90's and 35,000 people lost their jobs.

And so it started with a series of overfishing, from big, tasty things to small, not-so-tasty things, from nearby things to oceans all over the world, and that sort of thing.

It's not easy to understand, because you can go to Costco in the US and buy cheap fish.

You can't tell where the fish came from unless you look at the label, but it's still cheap.

It's hard for me to agree with you on this one, and in some ways I think it's very interesting to talk about fishing as a sport, because a lot of people like to go out and fish.

one of them is this

Here's a picture of a trophy fish. It's the biggest fish they've ever caught, and the angler pays a lot of money, gets in the boat, goes off the coast of Key West, Florida, drinks a lot of beer, throws in the line and the hook, catches the biggest, best fish, goes home, and puts the best trophy fish on this board and takes a picture of it.

This is what it looks like now, but this is what it looked like in the 1950s: same place, same ship, same port, same board.

The trophy fish was so big that you couldn't even lift a small fish.

The average size of a trophy fish is a 250 to 300 pound cod, so if you wanted to go out and catch something, you could expect to catch a similar big fish every time.

The taste of these fish was wonderful

In 1950, people weren't spending as much money as they are today to catch a small fish.

the situation is the same everywhere

It's not just fish that's been lost

The seafood industry uses large-scale equipment

using a net 20 miles long

Use a longline A longline has a million or two million hooks.

Trawl nets also catch fish. They're as big as a tractor-trailer and weigh thousands of pounds.

Imagine bulldozing a city, or clearing a forest, because you're wiping them out in the same way.

Habitat destruction is unbelievable

Here's a picture, a typical picture, showing what the continental shelf looks like around the world.

The streaks on the bottom look like they're looking at furrows, just like a field plowed to plant corn.

It used to be a forest of sponges and coral reefs, a vital habitat for fish to grow.

Now it's mud, the area of ​​the ocean floor, the area where the forest has been transformed into flat mud, but that's the total area of ​​forest on the planet that we've cut down in human history combined.

We've done it in the last 100, 150 years.

We tend to think of oil spills and mercury, and we hear a lot about plastic these days.

All of this is downright disgusting, but what's really tricky is the rise of biological pollution, because the scale of that change affects the entire ecosystem.

First, let's talk briefly about two types of biological contamination, one from alien species and the other from nutrients.

This is the infamous yew ivy, called the killer seaweed.

There's a book written about killer seaweed

It's embarrassing

It happened to be published by an aquarium in Monaco, bred as cold-water tolerant for use in aquariums.

It looked very good, and it began to rapidly overgrow in the northwestern part of the Mediterranean, which was once rich in biodiversity.

I don't know how many of you remember the "Little Shop of Horrors" movie, but this is the "Little Shop of Horrors" plant.

Instead of devouring the people in the store, an overgrowth occurred and obliterated virtually all life near the seafloor, across the entire northwestern Mediterranean.

I don't know what this seaweed eater is. I've tried all kinds of genetic tests and tried to find a solution, but as it stands, it's a monster from hell, and nobody knows what to do.

Now I'd like to introduce you to another type of pollution, biological pollution caused by excess nutrients.

The green revolution used too much artificial nitrogen fertilizer.

Financial aid was one of the reasons for the overuse

It flowed down rivers and fed on plankton, microscopic plant cells that live in coastal waters.

But because we've eaten all the oysters and all the plankton-eating fish, the plankton-eaters are gone, and they're growing more and more.

When they die, they sink to the bottom of the water and rot, but the bacteria break them down.

In this process of decomposition, they use up oxygen, and in doing so, they turn the environment into a completely lethal environment for organisms that cannot escape.

What you end up with is a mess of microbes, occupied by bacteria and jellyfish, as you know, on the left.

The only remaining fishing industry is commercial jellyfish fishing, which used to be shrimp fishing, pictured on the right.

Even in Newfoundland, they used to fish for cod, but now they've changed to jellyfish.

Another similar example is what's called a red tide or blue-green algae.

I was shocked by the photo on the left.

I've talked about this hundreds of times, and it's unbelievable.

The upper right part of the photo on the left is near the Mississippi Delta, and the lower left of that photo is the border between Texas and Mexico.

What you're looking at in this picture is the entire western Gulf of Mexico. What you're seeing is an outbreak of toxic dinoflagellates that can kill fish.

What you see in the upper right is what looks like a black cloud, but it's pushing toward the shore.

this is the same creature

As it approaches the shore and the wind picks up, tiny droplets of water mix with the air, filling hospital emergency rooms full of people with acute respiratory distress.

These nursing homes are on the west coast of Florida.

I was in Hollywood with a friend, and we called this Ocean Nights in Hollywood, and we were trying to figure out how we could explain what was going on.

And I said, "Imagine being in a movie called Escape from Malibu."

Those who remain are those who don't have enough money to move away from the coast, which is not a paradise but a health hazard.

this is amazing

It happened when I went on vacation to France in the early fall of last year.

It was this green algae and sludge that covered the beaches of Brittany.

What made this particularly noteworthy, besides being creepy, was that the seabirds that flew over it were suffocating to death from the stench, and one of the farmers was killed.

This is a war between farmers and fishermen, and the end result is that the beaches of Brittany have become routinely bulldozed.

And of course there is climate change, and everyone knows about climate change.

Perhaps symbolically, the ice in the Arctic is melting.

Think about the many people who lost their lives trying to find the Northwest Passage.

The Northwest Passage Already Exists

In a way, it's kind of funny, but on the coast of Siberia, the Russians might try to collect a toll.

Governments around the world are taking this seriously.

The military of the Arctic nations take it very seriously.

Governments that deny all about climate change, the CIA, Norway, the United States, Canada, whatever, are thinking hard about how to defend their territories.

Of course, Arctic societies are failing.

Another impact of climate change is coral bleaching, a phenomenon. Isn't that a beautiful picture?

All white coral

but they should be brown

What happened is that the corals are symbiotic, and the corals are symbiotic with zooxanthellae, and they live in the corals.

The algae provide sugar to the corals, and the corals provide nutrients and habitat to the algae.

But as the water heats up, the algae can no longer make sugar.

The coral will say, "I was deceived. I gave you a home and you didn't give me anything in return."

Corals expel algae, which then die.

Not all die, some survive, some will survive, but that's a problem.

Let me give you a little insight. Imagine that you went camping in July, somewhere in Europe or North America, and you woke up one morning and looked around to see that 80 percent of the trees, as far as you could see, were stripped of their leaves and bare.

And when I got home, I discovered that 80 percent of all the trees in North America and Europe had lost their leaves.

A few weeks later, I see an article saying, "By the way, a quarter of them died."

So that's what's happening in the Indian Ocean. The 1998 El Niño bleached more than 80 percent of the corals and killed a quarter of them in a sizeable region larger than North America or Europe.

The really scary thing is that all of these -- overfishing, pollution, climate change -- aren't all happening inside a vacuum tube.

There's this thing called positive feedback, where the interaction between these things has a bigger impact, and it's bigger than the sum of the parts.

The big scientific challenge we face, the challenge for those of us thinking about these things, is how do we put Humpty Dumpty back together?

because at this point we can protect

what does that mean

we don't know

What will the ocean look like in 20 or 50 years?

There are no fish at all, only small fish, and the water is very dirty, and it's full of bad things like that, like it's covered in mercury.

The dead zones are getting bigger and bigger, and they're starting to connect to each other, and you're going to start thinking, sort of like compartmentalizing the dead zones, globally and in coastal areas.

You wouldn't want to eat fish that grew up like that, and eating that fish is like eating Russian roulette.

Sometimes it hits the blue-green algae, other times it doesn't.

cannot accept

The most frightening thing is that physical, chemical and oceanographic things are really happening.

As the temperature of the sea surface rises, the water becomes lighter as the water temperature rises, and seawater circulation becomes more and more difficult to occur.

What that does is create more layers than ever before.

As a result, all these nutrients will affect the anchovy fishery, the sardines in California, the sardines in Peru and elsewhere, they will slow down and the fishery will collapse.

And in the same way, oxygen-rich surface water won't reach the bottom of the ocean, and the ocean will become like a desert.

The question is, how are we going to handle this situation?

All we can do is try to improve the situation, but in the end, what we really have to fix is ​​ourselves.

No fish, no pollution, no climate change.

We are all human Our desires and needs for development Our lack of imagination to think that we live in a world that is not selfish

So the question is, "Will we do anything about this?"

The future of life and human dignity depends on what we do.

Thank you. (Applause)

The messages I'm going to share with you are from the tens of thousands of people who live in remote villages and slums in this country, solving problems with their own talents and without outside help.

A few weeks ago, the Ministry of Home Affairs announced, "One-third of India is in civil war and over 200 areas are lawless." Missing the point.

A key point that we've emphasized for the last 21 years is that people may be poor financially, but they're not poor intellectually.

In other words, the intelligence at the edge is not the lowest intelligence.

With that message, we started 31 years ago.

What did you start with?

First, let me tell you about my personal journey to get there.

From 1985 to 1986, I was in Bangladesh as an advisor to governments and research institutions, advising scientists on how to tackle poverty and how to develop technological research, which is based on people's knowledge.

Returned home in 86

The knowledge and creativity that I saw in that country was very inspiring, a country where 60 percent of the people are landless, but there's incredible creativity.

When I look back at my work, what I've done in the last 10 years has mostly been the compilation of knowledge that people have shared with me.

I received my consulting fees in U.S. dollars, but when I looked at my income tax return, I asked myself, "Does it disclose how much of my income was paid to providers of knowledge?"

Am I getting paid for this because I'm smart?

Are you good at writing?

Is it because you speak well?

Are you good at data analysis?

As a university professor, are you entitled to this reward from society?

I tried to defend myself, "I've been working to change policy.

So why not make public policy more responsive to the needs of the poor?”

But after many years of dealing with exploitation by landlords, moneylenders and merchants, I realized that I was an exploiter as well. Nowhere on my tax return does it say, "This income is due to the superior knowledge of the people provided on the basis of trust and credit." Nothing is paid to them.

Up until that point, I was working exclusively in English.

Even though most informants don't understand English

Who do you mean?

He said he was an expert who spoke about social legitimacy, but he did something incredibly unfair.

If I find myself in a dilemma like this and I'm also an exploiter, this is wrong and I can't let this continue.

It was really hard at this time, I couldn't stand myself

So I've read and commented on over a hundred papers on value conflicts and moral dilemmas in social science and management research.

I finally found that the dilemma is singular, but not unique, and the solution must be unique.

One day, I don't remember the details, but maybe I saw a bee on my way home, and I thought, life would be wonderful if I could be like a bee.

What a bee does is pollination. It takes nectar from a flower and pollinates other flowers. It's mating.

When the bee collects nectar, the flower does not think that it has lost

Flowers use their colors to attract bees, and bees don't monopolize honey.

These are the guiding principles of the Bee Network: If you learn something from someone, you should share it with them on their own terms.

don't keep them anonymous

Twenty years later, this policy hasn't changed one millimeter.

It still bothers me, and I want you to realize that it's still permissible for experts to not reveal the source of someone else's knowledge, but to publish that person anonymously.

National Academy of Sciences, British Research Council, Indian Scientific Research Council, etc.

Research guidelines don't say, "If you learn something from others, share your knowledge in return."

We talk about a responsible society, an equal and just society, but there is no justice even in the knowledge market.

India is becoming a knowledge society

How can we become a knowledge society?

The two principles of justice, one for oneself and one for others, do not hold.

must be the same

can't pick and choose

You can't defend your own values ​​that are so far removed from the ones you hold

Must be fair here and there

please look at this photo

where was it filmed? photo for what?

I'm a professor, so I have a question. Anyone have an opinion?

once again? (Audience "Rajasthan") What is it used for? My goal is?

(noisy) Again?

You're right, clap your hands, because this man knows how insensitive our politics can be.

This is the site of the Government of India

Inviting tourists to come and see the country's shame

it's sad

Is this a beautiful photo or is it a cruel photo?

It all depends on how you perceive the lives of these people.

I wouldn't be happy if this woman had to carry water on her head for miles.

should do something

With all science and technology tens of thousands of women still carry water on their heads

no one doubts

you all had tea in the morning

think about it

Do you know how the tea leaves are picked from the shrub? The action is that the woman picks the leaves and puts them in a basket on her back.

Try it ten times, your shoulders will hurt

She repeats this action thousands of times each day.

The rice we ate for lunch and the rice we're going to eat today was planted by women who bend over in a very unnatural position to plant millions of seedlings each year during the rice-planting season.

Bacteria infest your feet in the water, resulting in an infection. Other insects bite the infected area, causing pain.

99.9 percent of rice is planted by hand each year

the machine is not developed

Scientists, engineers, public policy makers, change agents look the other way, and society doesn't work.

If the government can't handle this, there's an employment program, where 250 million people will be given 100 days of work by the state.

What do you think? Crushed stone or excavation

I asked Congress Do poor people have heads?

"Are you saying you have legs, a mouth, hands, but no head?"

The bee network builds on the rich material of the poor

what happens

Anonymous, faceless, nameless people join networks to prove their existence.

This is the bee network

This network is growing spontaneously and will continue to do so, trying to map the creative potential of tens of thousands of people at home and abroad.

It could be educational creativity, or cultural creativity, or organizational creativity, but most often it's creativity and innovation in technical areas, both from the perspective of modern innovation and from the perspective of traditional knowledge.

Curiosity is the source of everything

I'm curious

As you can see at www.sristi.org, this tribal figure had a wish.

"If my wish can come true--someone must have been sick and nursed--God, please heal him.

If you heal me, I will paint a mural."

this is his picture

There was talk of Maslow's Hierarchy of Needs theory yesterday.

Maslow's Hierarchy of Needs Theory may be totally wrong, because the poor in this country are being enlightened.

All the great Sufi saints, including Kabir Rahim, were poor and deeply enlightened, so don't think that you can only think about spiritual needs and enlightenment only when your physiological needs are met.

No matter who you are or where you are, if you have a goal, you can reach the heights of self-actualization only by achieving it.

look at this

I saw it during the show yatra (study tour), and we walk around different areas every six months.

I walked about 4,000 kilometers in 12 years.

On the way there was a lump of livestock dung for fuel.

This woman painted on the wall of this poop.

the only place where she can express her imagination

It is wonderful

This woman sitting in the granary is Ram Timari Devi and she lives in Champaran We were walking the land where Gandhi went to hear the suffering of the indigo growers.

Look, live in Purulia, Bankura

I'm Barbie Mahat

Every wall is a canvas She sits with a broom

Is she a craftsman or an artist?

An artist of course: creative

If these artists had a market, they wouldn't be digging and mining

You can make money with your talent, not your hard work.

(Applause) Look at Rojadine's reforms.

In Motihari, Champaran, there are many tea huts, but the demand for tea is limited.

I drink tea every morning, but I also drink coffee

So I had an epiphany to turn my pressure cooker into a coffee maker.

Here's a coffee maker for just a few hundred rupees

People can bring their own cookers, attach valves and pipes to them, and instantly have an espresso, a very affordable gas filtered coffee brewer.

(Applause) This is Sheikh Jahangir.

Many poor people have too little grain to be ground to flour.

So he drives around the wheat grinder on his two-wheeler.

500g or 1kg No matter how small the amount, the mill won't do it in small amounts.

I want you to know

Poor people want energy efficient, affordable and good quality.

not bad quality

Technology needs to match needs to deliver good

Sheikh Jahangir did

That's not all See this

If you have clothes to wash but don't have time, he'll drive the washing machine to your door on his two-wheeler.

This is a model of a two-wheel washing machine.

Washing and dehydrating at the entrance

(Applause) All you need is water and detergent. 50 pesas and 1 rupee will do the laundry for you. A new business model will be born.

What we need is someone who can spread these

look at this

it's a beautiful photo

Do you know what it is?

I know you are from India

this is tawa

It's a clay pot

I wonder what is better?

The nonstick pan you're using is about 250 rupees, $5 or 6.

It's under a dollar, and it's coated in a non-stick, harmless substance.

When you use those expensive nonstick pans, you have Teflon or something like that in your mouth.

It's a stomach, that's a problem, but this clay pot will never disappear into your stomach.

Good quality, safe, cheap and energy efficient

Poor people don't want cheap junk

Seeking better, more efficient, more affordable

Mansk by Prajapati is

I put a handle on this pot

One dollar can buy you something better than what's on the market

This woman made an herbal insecticide.

Patent pending with the National Innovation Foundation

If someone licenses the technology and develops a product for her, it will generate income for her.

The point here is that what we need is a multi-polar model of development, with a multitude of initiatives scattered across different parts of the country and around the world to meet needs in a localized way, efficiently and adaptively.

If it fits well in the region, it should spread further.

As we grow in scale, we may not be able to adapt to the needs of local people at the stage of providing products.

Will the consumer try to match the inappropriate?

Things can evolve and actually expand.

Cell phones, for example, there are 400 million cell phones in this country.

Just two buttons and three options are enough for me.

Even though it has 300 functions, I only use 3 of them, but I pay 300 as much.

Ultimately, of course, you need a phone with a different design.

The bottom line is that scalability should not conflict with sustainability.

There must be a place in the world where the solutions are local and can be funded.

What is certain is that investors are interested in, "What is the model that can be deployed at scale?"

So either you adapt to mass production or give up.

The famous long-tail model is that it's possible to make a profit from, say, a book that sells only a few of the many books.

It is necessary to create a system in which inventions that meet the small needs of each region are accumulated in a portfolio and investors can see them.

look at this man

Saidura Shahib is an amazing man

70 years old and full of creativity

(music) I couldn't wait for the ship

I had to meet my darling

I developed it desperately

Even love needs the help of technology

The invention belongs to my wife Nord.

invention is my purpose

it's my technique

(Applause) Saidura Shahib lives in Motihari, Champarang.

He's a great guy, but at his age he makes his living selling honey on his bike because we still can't sell to water parks, lake residents and (obscure) businesses.

Even the Mumbai fire brigade can't convince them that when there was a flood a few years ago, people had to walk 20 kilometers through the water, and if the fire station had this bike, they could go through waterways where buses and other modes of transport couldn't go.

There are still challenges to getting it used for rescue and peddling, but it can also be used for peddling to deliver goods to the individual islands that were isolated during the floods in the East India.

But ideas have value, they have benefits.

Please see Apachan Unfortunately he is no more but he left me a message

A very powerful message I see the world wake up every day

(music) A coconut didn't fall on my head, I just had an epiphany

We had no money, but we tried new heights

Now he's called the local Spider-Man

it's my technique

(Applause) Many of you may not think that this product is sold internationally. I call it the G2G model. From grassroots to the world.

A professor of zoology at the University of Massachusetts bought it to study the diversity of insects on treetops.

This allowed us to collect samples from many palm trees, without which we would have had to build a large brick scaffold that our students would have to climb.

In this way we also contribute to the advancement of science.

Developed by Remiya Jose

Search "India Innovation" on Youtube to see this video

This is from her freshman year of high school, and it's a washing machine and exercise machine.

Karai is only 46cm tall

There he modified his two-wheeled vehicle so that he could move around freely as he pleased.

This idea came from the slums of Rio.

Mr. Ubirajara

I'm Brazilian, and I'm trying to see if I can bring this model to China and Brazil.

We have a particularly active network with China, but it's also spreading to Brazil and other countries.

This is a front-wheel standing bike like no other.

India and China are big bike nations.

The idea originated in Brazil

So don't assume that the best ideas will always come from your own country.

We must be more humble and learn from the financially poor wherever we live.

There are bike-based innovations like atomizer bikes and road shock bikes that store energy.

We can't make the road better, but we can make the bike go faster

Credit to Kanakadas

We even took our innovators to South Africa to talk with our South African colleagues about how innovation can help free them from the heavy lifting.

This is their modification of the donkey wagon.

There were 30 and 40 kg axles, but they weren't useful, so

When I removed it, I didn't need a donkey

This is China, this girl needed a respirator.

Three villagers got together and asked, "How can this girl live long?"

I'm not even a relative, but I wanted to help. Maybe I should use the drain pipe from the washing machine.

This respirator saved her life and she's very happy.

various innovations

A pneumatic car can run at 6 pas per kilometer

Assam Kanak Gogoi

This car isn't in America or Europe, but it's in India.

This woman was spinning yarn to make pochan parisari

Spinning 18,000 times a day, it spun two saris.

It took my son seven years to build this

When I told my son to change jobs,

"This is all I can do, so it's impossible. I'll invent a machine that will help your mother through her hardships."

Sewing machine from Uttar Pradesh

At Thristy they say, "Given the opportunity, let's move the world."

We also run children's competitions for creativity in general.

We have sold these products all over the world, from Ethiopia to Turkey, USA and others.

There are quite a few products on the market

Based on the knowledge of these people, the herbal bait cream for eczema was created.

The company that has the license to market this herbal pesticide posted a picture of the developer and said, "You can be an inventor too.

If you have an idea, please send it to me."

Creativity is valuable Knowledge is important Innovation creates change Incentives drive motivation

Incentives need not be material

Thank you very much

(applause)

The story goes back 15 years, when I was working as a hospice doctor at the University of Chicago.

She cared for dying people and their families in South Chicago, and

I've seen what happens to terminally ill patients and their families.

And in my lab, I was studying the effects of widowhood, an old 150-year-old idea in sociology known as "death of grief."

For example, if I die, my wife is twice as likely to die for the next year.

I was caring for a patient, a woman with terminal dementia.

Unlike the two people in the picture, this woman was cared for by her daughter.

The daughter was exhausted from caring for her mother.

And your daughter's husband also suffered from his wife's exhaustion.

One day, as I was driving home, I got a call from the husband's friend, who said that he was depressed because he saw his friend in pain.

So that's why I got a call from someone I didn't know, who was influenced by someone socially distant to call me.

This made me realize two very simple things.

It's not just between two people

I began to see the world in a whole new way, as people are connected in pairs.

I also noticed that these pairs would connect with other nearby pairs to form quadruplets.

On top of that, these people are embedded in many other relationships, such as marriage, spousal relationships, friendships, and many other relationships.

In fact, these connections are vast, and what's more, we are all embedded in these broad connections.

I began to see the world in a whole new light, and I fell in love with it.

I couldn't stop thinking about why we are part of this social network and how it affects our lives.

There's an intricate beauty about social networks -- they're so sophisticated, they're so complex, they're so ubiquitous that they make you wonder what role they actually play.

Why are we embedded in social networks?

How is it formed and how does it work?

And how does it affect us?

My very first topic about social networks was not death, but obesity.

It was suddenly fashionable to talk about the obesity epidemic.

My colleague, James Fowler, and I began to wonder if obesity is really contagious, or if it spreads from person to person like the four people I just talked about.

This slide is part of an early research result

2200 people in 2000

Each dot is a person, and the size of the dot is proportional to the size of the person, so the larger dots are the larger people.

In addition to size, people with a BMI or body mass index of 30 or higher, which means they're medically obese, have a yellow dot.

Now, if you look at this image, you can see at a glance that there is a group of people who are obese and a group of people who are not.

But this image still looks pretty complicated

It's hard to understand what exactly is happening

And some questions immediately come to mind: How densely clustered are we here?

Are there more populations than could happen by chance?

How big will the group size grow?

And above all, what makes these groups?

So we calculated and analyzed the population size

What you can see here on the Y-axis is how an obese person and a socially connected person increase their odds of being obese themselves, and the X-axis is the distance between the two.

The leftmost purple graph is

If your friend is obese, you are 45% more likely to be obese yourself.

The red graph next to it shows that if your friend's friend is obese, your risk of obesity increases by 25 percent.

And the graph next to it shows that even if a friend of a friend of a friend, a friend of a friend, or someone you don't know is obese, the risk of obesity increases by 10 percent.

And when you're far away from a friend's friend's friend's friend, that person's body type finally has nothing to do with your body type.

So what causes collectivization?

I can think of at least three possibilities.

In other words, it can spread from person to person.

The second possibility is that everyone thinks of homozygous tendencies, or the possibility that "like attracts like," which is basically "we have similar body types, so let's be friends."

And the third possibility is known as confounding, because it derails our ability to judge the current situation.

In this case, it's not the idea that my weight gain causes the other person to gain weight, but it's not the idea that we want to be friends with each other because we both have similar body types. Rather, it's the idea that we have something in common, such as the gym, where two people lose weight at the same time.

Analysis of the data substantiates all of these possibilities, including "induction."

And they found that if one of your friends became obese, you had a 57 percent increased risk of becoming obese yourself in the same time period.

I think there are a number of mechanisms behind this phenomenon. One is the possibility that your friend adopts a certain habit and spreads it to you, like, "Let's have a muffin and a beer."

Another tricky possibility is that your friend's gaining weight can change what you think is acceptable for your body type.

Here, it's not a habit that spreads from person to person, it's common sense, an idea that spreads.

By the way, the insider reporters went nuts over our research.

The headline in the New York Times article was indeed "Are you gaining weight?

- It's your obese friend's fault." What was interesting was that the European journalists had a different take, and their headline was, "My friend is getting fat?

(Laughter) I thought that was an interesting comment about America and the selfish, "it's not my fault" phenomenon.

Now, let me be very clear here: we don't think this study justifies people's prejudices about body type.

So our next question was, can we visualize these spreads?

Could one person's weight gain be contagious to another?

This was very complicated, because we had to consider that the structure of the network, the composition of the connections, was constantly changing over time.

Also, obesity is not a single-source epidemic, so there is no "patient number one" in an obesity epidemic.

lots of people doing different things at the same time

I'm going to show you about 30 seconds of video footage that James and I have been working on for five years.

As before, each dot is a person.

The line connecting the dots represents the relationship between the people.

I'm going to play the footage now, and the network's daily cuts last for about 30 years.

You'll see the dots grow, and you'll see a multitude of yellow dots taking over the network.

As people are born and die, the dots appear and disappear, and the dots connect and disconnect because they get married, divorced, become friends, and become unfriends.

A lot of really complicated things have happened in just the last 30 years, including the obesity epidemic.

And eventually, you'll see a population of obese people and a population of non-obese people in the network.

When I saw this, my perspective changed, because this network is changing over time, it has memory, it has movement, it has some things that circulate within it, and it has a certain consistency. People may die, but the network doesn't die.

So I began to see this kind of social network as a living thing, something that we could study, analyze, and better understand using something like a microscope.

Various means are used for this purpose.

I began to study many other kinds of phenomena.

Smoking and drinking habits, voting behavior, and even divorce -- which is widespread -- and altruism.

And then I became interested in emotions too.

Now, when we have emotions, we express them.

How do you show your emotions?

Although there are benefits to experiencing inner emotions such as anger and happiness,

We don't just experience emotions, we express them

Not only that, but people around you can read your emotions.

You can not only read, but also imitate

"Emotional contagion" happens in groups.

So the function of emotions is like a rudimentary means of communication, in addition to their other purposes.

In fact, if you really want to understand human emotions, you have to think like this.

By the way, we tend to think of emotions as simple and short-lived.

For example, I was giving a talk in New York City recently, and I said, "If you're on the subway and the person across from you smiles at you, you automatically smile back."

The audience would say, "We don't do that in New York City," with a straight face.

So it's very instinctive that we communicate emotions in the moment.

What's more, "emotional contagion" can occur more broadly

Something like an intermittent expression of anger, like a riot.

What we wanted to know was, can emotions spread over time in a more lasting way than in cases like riots, and can they spread between more people than just two people smiling in a subway car?

Maybe there's some kind of quiet riot beneath the surface that keeps us going all the time.

Or maybe a collective emotional runaway ripples through social networks.

Maybe emotions are really a collective entity, not just an individual entity.

This is one of the first images I made to study this phenomenon.

This is also a social network, but this time yellow is for happy people, blue is for sad people, and green is in between.

If you look at this image, you can immediately see that there's a group of happy people and unhappy people, again spread out three people's distance apart.

And, intuitively, unhappy people occupy different places in the network fabric.

This network has a middle and an edge, but unhappy people tend to be on the edge.

To use another analogy, if you imagine the social network as a giant human construct, I'm connected to you, you're connected to her, and so on and on.

Whether or not the person is happy also depends on whether or not they are on the happier piece of cloth.

(Laughter) This study of emotions, which is very basic, made me think that the underlying reason why humans form social networks might be encoded in our genes.

Because when you map out a human social network, it always looks the same and looks like this diagram.

it will never be like this

Why doesn't it look like this picture?

Why don't we form a regular grid of social networks?

The striking pattern of human social networks, their ubiquity, and their apparent intent begs us to question whether we evolved to have social networks in the first place, to form specific structures.

But to understand this, we first have to look closely at the structure of the network, and notice that everyone on this network is in the same structural position.

But that's not the case in real networks.

For example, here's a real-life network of students at an elite university in the northeastern United States.

some points are highlighted

Look at the dots and compare B on the top left with D on the far right. B is connected to four friends, and D is connected to six friends.

So these two people have different numbers of friends.

But this is obvious to everyone.

But social networks also have a less obvious side.

Compare upper left B with lower left A

They both have four friends, but A's friends all know each other, but B's friends don't know each other.

So friends of A's friends are also friends with A, but friends of B's ​​friends are not friends with B and are farther away from B on the network.

This is called network transitivity

And finally, compare C and D. Both C and D have six friends.

When I asked these two people, "What kind of social life do you lead?"

They both said, "I have six friends.

That's my social life."

But if you look at this network, you can see that these two people are in very different societies.

Now, if you ask me this, you'll have an intuitive sense of what would happen if a deadly pathogen were to spread across your network.

Which do you want to be, C or D?

You want to be D on the edge of the network

So what if there's a delicious gossip about someone other than yourself circulating on the network? In this case, I would like to be C.

So being in different structural positions brings different meanings to your life.

We've done some experiments on this, and we've found that 46 percent of the range in how many friends you have is actually determined by your genes.

But this shouldn't be too surprising, because some people are naturally shy.

We all know that some people are sociable.

But we also found something surprising: 47 percent of whether two of your friends know each other, for example, is determined by your genes.

Whether or not your friends know each other depends not only on their genes, but also on your own.

I think that's because some people like to introduce their friends to each other, and some people keep their friends at a distance and don't put them together.

And then there are those who weave a network around themselves, creating a lot of connections that they can sit comfortably in.

And finally, we found that 30% of the time people are in the middle of the network is due to genes.

Whether you're in the middle or on the edge of the network is partly genetic.

So what does this mean?

How does it help us make sense of the world?

How can it help solve the problems we face today?

What I'm trying to say is that networks have value.

It can be said that it is a kind of social capital.

Our inclusion in social networks creates new traits, and those traits are inherent not only in the individuals within the network, but also in the structure of the network itself.

Think about these two objects that have something in common

They're both made of carbon, but the object on the left has carbon atoms arranged in a certain way, which is soft, black graphite.

But if you connect the same carbon atoms in different ways, you get a transparent, hard diamond.

The properties of softness, hardness, darkness, transparency, etc., do not reside in the carbon atoms. They reside in the bonds between the carbon atoms.

Similarly, patterns of relationships between people give different characteristics to the group.

It's the connections between people that make the whole greater than just the sum of its parts.

It's not just about what's happening to the people around us. It's not just whether we're leaner or fatter or richer or poorer or happier or unhappier, but it's also affected by the very structure of relationships that surrounds us.

What we experience in this world is highly dependent on the actual structure of the network in which we exist and all the things that ripple through the network.

I believe this to be the case, because humans group together to form a kind of superorganism.

A superorganism is a group formed by gathering a large number of individuals, and in order to show behaviors and phenomena that cannot be understood even if studied at the individual level, it is necessary to treat it as a group and study it to understand it.

For example, a swarm of bees looking for new nesting sites, a swarm of birds trying to evade their enemies, a swarm of birds that muster their wits to fly to a tiny island in the middle of the Pacific, and a swarm of wolves capable of taking down prey larger than themselves.

Superorganisms have properties that cannot be understood just by studying them individually.

Understanding how social networks are formed and work will not only help us better understand health and emotions, but it will also help us understand many other phenomena, such as crime and welfare, bank runs and market crashes, economic phenomena such as the introduction of new ideas and the evolution of product adoption.

try this

I think we form social networks because the benefits of our relationships far outweigh the costs of getting them.

If I were to be violent towards you all the time, spread rumors, make you sad, spread deadly germs, you would cut ties with me, and the network would collapse.

So in order to maintain and further develop social networks, we need to spread the good and the worthy.

In the same way, social networks are needed to spread good and valuable things, like love and kindness, happiness and altruism and ideas.

In fact, if we all realized how valuable social networks are, we'd spend a lot more time developing and maintaining them, because social networks are fundamentally tied to goodness.

And I think what the world needs right now is more connections.

thank you

(applause)

we are inventing

My company invents a wide variety of new technologies in various fields.

I'm doing this for two reasons

We invent for fun, and inventing is a lot of fun, and we also invent for profit.

The two are related. It takes a long time to make money.

So a lot of what we do is invent for fun and for profit, but we also have a program to invent for humanitarian purposes, and we have the best inventors working on it, and we want to come up with clever solutions to the world's problems.

One of the brightest people working on these issues is Bill Gates, and he's also invested in our work, and we appreciate that.

So I'm going to briefly describe some of the problems we have, and show you just a couple of solutions we're working on.

Vaccination is an important technology in public health, and it's a wonderful thing.

In developing countries, many vaccines are spoiled before they can be used because they need to be chilled.

Most vaccines should be refrigerated

If you don't cool it down, it'll go bad in a short time, but that's hard to do without a stable power grid, and children are dying as a result.

It's not just the vaccines that are wasted, it's the children that aren't getting vaccinated.

This is how vaccines are transported, in Styrofoam boxes, which are carried by people or on trucks.

we thought of another way

That styrofoam box can be filled with ice and kept cold for about four hours.

But I thought that wasn't enough

So this is what I made

It lasts for six months without electricity, it loses less than half a watt, so it doesn't need electricity at all.

This is the 2nd generation prototype

A third-generation prototype is currently being tested in Uganda.

There were two key ideas to make this happen, like a cryostat for storing liquid nitrogen and liquid helium.

One is to have very high thermal insulation.

Another idea, which is kind of funny, is to make it impossible to touch inside.

If you could open the lid and touch the inside, the heat would get in and it would be game over.

So the sides of this are like cola vending machines

From there comes the individual vials

I hope this simple idea will change the way vaccines are shipped in Africa and beyond.

Let's move on to malaria

Malaria is one of the major public health problems

Esther Duflo was talking

250 million people get malaria every year

A child dies in Africa every 43 seconds, and 27 will die while I'm talking.

What it's like for those involved, there's really no way for us here to figure it out.

The other thing that Esther was saying is that while we react to tragedies like Haiti, the malaria tragedy continues.

What can we do?

A lot has been done over the years to address the problem of malaria.

You can spray disinfectants, but that creates environmental problems.

You can also try to treat and enlighten

The great thing is that in areas where malaria is really bad, we don't have a health system.

Vaccines are great, but none are effective yet.

After years of research, we've come up with two interesting candidates.

It's very difficult to make a vaccine against malaria.

We can also distribute mosquito nets, which are very effective, but not used as mosquito nets.

May be used for fishing

it doesn't go to everyone

Bed nets are effective in controlling the spread of malaria, but bed nets cannot eradicate malaria.

malaria is a very complex disease

I can talk for hours

I live like a soap opera, I have relationships, I burrow into the liver, I invade the blood cells.

It's a very complex disease, but we actually got interested in it and decided to work on it. There are many possible ways.

One way is to make better diagnoses.

I hope to build prototypes of these devices this year.

One is something that automatically diagnoses malaria, like a glucometer for diabetes, where you take a drop of blood, put it in, and it automatically gives you the answer.

Today, you have to go through an elaborate lab procedure, make a lot of microscope slides, and have a trained human look at them.

Even better if you don't have to draw blood.

By looking through the eye and looking at the veins in the white of the eye, you might be able to see it directly without having to draw blood, or maybe even in the nail bed.

You can see blood vessels through your nails, and if you can see blood vessels, you should be able to see malaria.

And what you can see is because of a molecule called hemozoin.

It's produced by a malaria parasite, and it's a substance with a very interesting crystal structure.

very interesting for solid state physicists

There are so many things you can do with this

This is our femtosecond laser lab

creates femtosecond-long pulses of light

really really short

It's a pulse of light that's about the length of one wavelength of light, and it's a bunch of photons coming in at the same time and hitting them.

It has a very high peak power output, and you can do a lot of really cool things with it, especially to find hemozoin.

This is an image of a red blood cell, and it can show where the hemozoin is in the red blood cell and where the malaria is present.

I believe that this technique and other optical techniques can be used for diagnosis.

There are other malaria treatments that use hemozoin to filter out malaria parasites from the blood in an emergency.

It's kind of like dialysis, which reduces the toxicity of parasites.

This is a 1000 core supercomputer

We're software guys, and we try to solve any problem with some kind of software.

The problem with trying to eradicate or reduce malaria is that we don't know what's most effective.

There was talk of a mosquito net

How often should I use the mosquito net?

Or spraying chemicals

prescription of medicine

Everyone is a different coping method, and they have different effects.

How do we know?

So we used a supercomputer to create the world's best malaria model, and you can see it.

I chose Madagascar.

Every road Every village Here you will find information about Madagascar almost to the square inch.

We have rain data, we have temperature data

This is very important because humidity and rainfall can tell us if there is a pool of water for mosquitoes to lay their eggs.

The stage is now set

Then we introduce mosquitoes, and we have a model of how mosquitoes develop.

This is what you get in the end

This is the malaria situation in Madagascar.

the second half of the rainy season

entered the dry season

In the dry season, it's almost gone, because there's no place for mosquitoes to lay eggs.

Then the next year, it will rise again

By doing simulations like this, we're doing thousands of iterations of malaria eradication and control in software before we actually do anything about it, and we're looking at the economic trade-offs -- how much netting, how much spraying, and social trade-offs, like what happens in the event of social unrest.

we're also studying our enemies

This is high-speed camera footage of a mosquito.

After this there is a stream of air

The airflow around the mosquito's wings is visualized by laser-illuminated microparticles.

By knowing how mosquitoes fly, I want to know how I can stop them from flying.

One way to keep it from flying is DDT

this is a real ad

not artificial

In the old days, this was the main tool, and in fact, in many countries, malaria was eradicated by DDT.

America did in 1935

There were 150,000 cases of malaria in the United States a year, but DDT and massive public health efforts eradicated it.

So, of all the things we had to deal with, we did everything we could with the malaria parasite.

So what can we do about mosquitoes?

How about exterminating using home appliances?

It may sound silly, but there's a lot of interesting stuff available in these devices.

Blu-ray players contain very cheap blue laser devices.

Laser printers contain galvanometers that are used to control the laser beam very precisely, thereby drawing tiny dots on the paper.

And then, of course, there are signal processing digital cameras and things like that.

How about putting these together to shoot down flying mosquitoes with a laser?

(Laughter) (Applause) At our company, we call this the pinky-sucking moment.

(Laughter) What if we could?

Put your doubts aside and think about what would happen if you could do that.

You can protect high-value sites like clinics.

There are many malaria patients in the clinic

They are sick and powerless to protect themselves from mosquitoes.

you want to protect them

Of course, you can also protect your own backyard.

Farmers can protect the crops they sell to natural food companies, because the photons we use are 100% organic, all natural.

actually this could be better

If we get it right, we can hit the insect with a non-lethal laser, hear the frequency of its wings, and measure its size before it's killed.

And you can decide if it's an insect you want to get rid of or not.

Moore's Law has made computations so cheap that you can weigh the life of an individual bug and decide whether or not to kill it, and it only kills female mosquitoes.

Females are dangerous

Mosquitoes suck blood to lay eggs

We get our daily nutrition from the nectar of flowers, and in fact in our lab we feed on raisins, but females need blood.

Sounds pretty crazy, right?

do you want to see it?

(venue yay)

Okay, I'm going to show you a note from our legal department, this is it.

(Very scary laser -- don't stare into the beam with your remaining eye.) (Laughter) After thinking about this demo for a second, I thought it would make more sense to use a non-lethal laser.

Eric Johansson actually built this device out of parts he bought on eBay, and Pavlos Holman over there is collecting mosquitoes in a tank.

here is the device

What I'm going to show you isn't a pulsed, lethal laser, but a green laser pointer that you can hold on to a mosquito for a long time, otherwise you wouldn't be able to see it.

Well, Eric, please.

There's an aquarium on the other side of the stage

You can see mosquitoes flying around on this computer screen.

If Pavlos stirs it up a little more, you should be able to see it flying around.

This is a very simple image processing routine, let me explain how it works.

It's chasing a flying mosquito, isn't it kind of funny?

Now let's take a laser and actually hit a mosquito, and it's a low-power laser, and we can pick up the frequencies of their wings.

I hope you can hear the hum of mosquitoes flying around.

What is ringing now is the sound of mosquito wings

Finally, let's take a closer look at how things are going

Flying mosquitoes are illuminated

I'm slowing it down so you can see what's going on.

I was shooting in high speed mode.

This system was created at TED to show that something like this is possible, and we're working hard to figure out how to make it more cost-effective to make it work in places like Africa.

(Applause) You've got to see what happens when a real laser hits a mosquito, doesn't it?

(Laughter) (Applause) It's a satisfying moment.

(Laughter) This video is from when we first did it.

Your energy is a little too strong

(Laughter) Another video

Let it play in a loop...

The funny thing is, no matter how many times I shoot it down, it never stops in the air.

Wing muscles are very elastic.

Even if the wing is blown off, the wing's muscles continue to move as it falls.

Thank you very much

(applause)

Today I'm going to talk about two things: first, what have we lost, and second, how to get it back.

First

That's my benchmark, the Mediterranean coast, where there are no fish, exposed rocks, and lots of sea urchins that love to eat seaweed.

The first sea I dived in was one like this, on the Mediterranean coast of Spain.

If an alien came to Earth - let's call him Joe - what would he see?

If Joe were to dive into the reef, he would see a lot of life.

Joe will rarely dive into pristine reefs, which are teeming with corals, sharks, crocodiles, manatees, groupers and turtles.

This is the part that Joe will probably see, the green side.

There are dead corals and lots of microbes and jellyfish.

Divers are present in most of the world's reefs, with little coral, algae infestation, lots of bacteria, and no macro organisms.

It's a situation that many oceanographers have seen.

This is the standard, the oceanographer's idea of ​​nature, and our current science began with scuba diving, long after humans began destroying ocean ecosystems.

So I invite you to enter the time machine on the left side -- go into the past, and see what the ocean once looked like.

Let's start with this time machine, Rhine Island, where we did a series of National Geographic surveys.

An archipelago belonging to Kiribati, extending across the equator, some uninhabited, unfished, pristine islands, and some inhabited islands.

The first island, Christmas Island, with a population of over 5,000 people.

Most of the reefs are dead, the corals are dead, they're overgrown with algae, and the fish here are smaller than the pencils you use to count them.

We did 250 hours of diving in 2005.

I didn't see a single shark

Captain Cook, who discovered the island in 1777, noted numerous sharks that bit the rudders and oars of small boats as they landed.

Let's go further back in time

Fanning Island is home to 2,500 people.

The coral reefs are healthy and there are countless small fish.

It looks like a paradise for many divers.

You can see the same thing in most of the Florida Keys Federal Marine Sanctuary.

A lot of people find it very beautiful, if that's the standard.

If we go back to the oceans like Palmyra Atoll, where Jeremy Jackson and I visited a few years ago, the coral conditions were much better and there were plenty of sharks.

We encountered sharks on every dive

which is rare in today's coral reefs

But on the other hand, if you turn the dial back 200 or 500 years, we arrive at a place where the corals are in perfect condition, absolutely beautiful and spectacular, where predatory fish are the most prominent creatures, and you'll meet anywhere from 25 to 50 sharks on a single dive.

What have we learned from these places?

It is the form of nature that we have been thinking about.

called the biomass pyramid

If you collect all the fish on the reef and weigh them, you get this.

Herbivores at the bottom of the food chain account for most of the biomass, such as the algae-eating parrotfish and surgeonfish.

Little plankton-eating damselfish, little creatures floating in the water.

Carnivorous fish have a smaller biomass and an even smaller biomass at the top, which includes sharks and large snappers and groupers.

it goes like this

This worldview is the result of research on degraded corals.

When I visited a pristine coral reef, I realized that the natural world is the complete opposite, and this pyramid is turned upside down.

The top organisms make up the majority of the biomass, up to 85 percent in some places, found on Kingman Reef, which is now protected.

The good news is that populations of everything, not just carnivorous fish, are increasing.

this part is bigger

More sharks, more snapper biomass, more herbivorous fish biomass, and this parrotfish looks like a sea goat.

Clean the coral and eat everything you can see Keep the coral clean and help the coral recover

Primordial and unexplored waters, not just here, are not only home to many fish, but also large clams, which are important components of the ecosystem. The lagoon giant clams inhabit 20 to 25 per square meter.

These mussels have disappeared from human-inhabited reefs. Giant clams filter water, keeping it clean from microbes and pathogens.

but global warming is happening

It's a good thing that corals aren't legally protected or too far away to be fished.

If the sea temperature rises for a long time, the coral will die.

How can these fish and carnivorous fish help us?

What we witnessed in one area was the El Niño years of 1997 and 1998, when the water was too warm for too long, and many corals bleached and many died.

On Christmas Island, the food web has shrunk, the large animals have disappeared, and the corals have not recovered.

Coral hasn't recovered on Fanning Island either

As you can see, the big table corals are dead and crumbling.

Since the fish eat the algae, there are few algae growing areas.

Let's take a look at Palmyra Atoll, where herbivorous fish have a large biomass, dead corals are being cleaned, and corals are recovering.

Take a look at the pristine sea, was it once bleached?

Again, the coral bleached, but recovered quickly.

The more intact the food web, the closer it is to perfection, the more complex it is, the more resilient it is, making the system more resilient to the short-term effects of warming.

This is good news. We need to restore this structure.

We need to make sure that the ecosystem is all in place, so that the ecosystem can adapt to the effects of global warming.

If we need to reset the norm and return the ecosystem to the past, how can we do it?

there are several ways

One sure way is marine reserves, especially no-fishing reserves, and we wait for the marine life to recover.

Let's go back to pictures of the Mediterranean.

It's the sea that I saw when I was a child and that became my standard.

At the time, I was watching a Jacques Cousteau show that showed the ocean with its richness and diversity of life.

I thought that this rich sea must be a tropical sea, and that the Mediterranean was originally a poor sea.

I had no idea until my first dive in a marine reserve.

I saw a lot of fish there

Within a few years -- maybe five or seven years -- the fish were back, they were eating sea urchins, and algae was starting to grow.

If you have a small algae bed, you can find over 100 species of algae in a space the size of a laptop, almost microscopically visible, and hundreds of tiny organisms that feed the fish and restore the system.

It's the Medes Islands Marine Protected Area. It's only 94 hectares, but it brings in 6 million euros to the local economy, 20 times more than fishing, and 88 percent of tourism income.

Protected areas not only save ecosystems, they serve people, and people benefit from ecosystems.

Summarize the role of no-fish reserves

By protecting these sites, compared to unprotected surrounding sites, the following things happen:

There's a 21 percent increase in biodiversity -- if you have 1,000 species, you'll have 200 more species in a protected area.

this is a considerable number

The size of the creature becomes 30% larger, and the fish becomes this size.

Abundance - 170 percent increase in fish density per square meter

Biomass will see the biggest change, increasing 4.5 times over an average of five to seven years.

In some places, the biomass of the protected area can be as much as 10 times.

How can organisms grown in protected areas help?

Fundamental to population biology, they reproduce.

If you don't kill the fish, the fish will live longer, grow bigger and reproduce more.

It's the same with invertebrates, here's an example.

Egg snails, spawned by snails along the Chilean coast, but countless eggs are laid on the seafloor.

You can't even find them outside the reserve.

There are 1.3 million eggs per square meter within the reserve, and snails are abundant.

These creatures reproduce, and the little larvae spill out, and the whole thing spills out, and people outside of the protected area also benefit.

Nassau Grouper in the Bahamas

The reserve has a large population of groupers, and the closer you get to the reserve, the more groupers there are.

Fishermen catch more fish

You can clearly see the boats lining the boundaries of the reserve.

The overflow of fish brings benefits beyond the reserve, helping people around it, while at the same time protecting and resilience all life in the reserve.

The current situation is that a world without reserves is like a debit account where you always withdraw and never deposit.

Reserves are like fixed deposit accounts

The untouched capital produces profits - social, economic and ecological benefits.

Increasing biomass within protected areas is like compounding interest.

Here are two examples of how protected areas benefit people

This is how Kenyan fishermen's income changed over the years when they fished every day, where the sea is unprotected and they can fish freely.

Eliminating the most harmful fishing gear, the dragnet, has increased fishermen's catches.

Reducing fishing actually increases the catch

Adding no-take reserves would further increase the income of fishermen by reducing fishing around the reserves.

Another example is the Nassau Grouper on the Mesoamerican Reef in Belize.

Here's how groupers reproduce. Groupers gather for a week as the December and January full moons approach.

There used to be tens of thousands - 30,000 groupers per hectare, forming a colony.

The fishermen who knew this overfished and their numbers plummeted.

When I first visited in 2000, there were only 3,000 groupers left.

Fishermen were allowed to catch 30 percent of the adult population each year.

So I did a simple analysis, and it's not hard at all.

Not just the fisheries, but the entire reproductive capacity of the organism is wiped out.

The same thing is happening all over the Caribbean

The annual income is $4,000, which is the total income of the entire fishery, which is made up of several boats.

Let's do an economic analysis here and predict what will happen: if you don't kill any fish and bring in 20 divers for a month each year, your income will increase 20 times and will be sustainable over time.

how much are you actually doing

If it's great and very easy, how many are doing it?

As you know, not one percent of the ocean is protected.

We're finally getting closer to 1 percent, thanks to the protection of the Chagos Islands, and there are only a few oceans where fishing is completely banned.

Scientific studies recommend that at least 20 percent of our oceans should be protected.

Estimates range from 20 to 50 percent, depending on goals such as biodiversity, expanding fisheries, building resilience.

Is this possible and you will be asked how much it will cost

Think about how much money we spend subsidizing fishing, $35 billion a year.

Most of the subsidies go to destructive fishing.

Here are some estimates of how much it would cost to build a network of protected areas that would cover 20 percent of the ocean.

People are out of work as fisheries collapse

A network of protected areas will create direct employment for over a million people, as well as secondary jobs and benefits.

how is it possible

It's pretty obvious that these fixed deposit accounts are good for the environment and people. Why aren't we protecting 20 percent or 50 percent of the ocean?

how can i reach my goal

there are two ways

An easy solution is to create huge protected areas, places like the Chagos Islands.

The problem is that large protected areas can only be built in places where there is no human habitation and no social conflict, where the political cost is low and the economic cost is low.

There are some people here and people starting organizations that are working on this.

What about other coasts around the world where people live by fishing?

There are three reasons why there are so few small protected areas. First, many people are unaware of the role of marine protected areas, and when it comes to legislation and protection, fishermen tend to be defensive, even in small areas.

Second, governments are bad. Most coastal communities around the world don't have the power to manage the resources to create and maintain protected areas.

It's a top-down hierarchy where people are waiting for government officials to come, which is not effective, and governments are underfunded and understaffed.

And the third reason, the reason there are so few protected areas, is the wrong funding model.

NGOs and governments spend a lot of time, effort and resources in a few small places.

Marine and coastal protection is a dumping ground for government and philanthropic funding and is not sustainable.

the answer is the solution to these problems

We'll start by launching a global awareness campaign, calling on communities and governments to create no-fish reserves that can improve the situation.

It will be a fixed deposit account for the withdrawal account

The second is the redesign of governance, so that conservation can be decentralized, so that conservation can be generated community-driven rather than relying on NGOs or governments, which is already happening in the Philippines and in some regions.

And the third is very important: we need to build new business models.

Charity is not the only sustainable way to create reserves.

Business models need to be developed Coastal protection is an investment As we all know, marine protected areas provide social, ecological and economic benefits.

I'll end with one final thought: this is what it means: no one organization can save the oceans alone.

There's been a lot of competition in the past. What we need is a new model of partnership, one that truly works together, that we want to complement, not replace.

The problem is too big if we continue the way we are now.

take action thank you

(Applause) (Chris Anderson) Thank you Enric.

(Enric Sala) Thank you.

CA: That was a great story that put all this together.

As for your pyramid - I mean the inverted pyramid, I find it very unlikely that 85 percent of the biomass is carnivorous fish.

Can 85 percent of carnivorous fish survive on 15 percent of fish?

ENRIK: Imagine two gears in a clock, one big and one small.

Large gears move slowly Small gears move fast

is basically the same as

Organisms lower down the food chain reproduce faster, grow faster and lay millions of eggs.

At the top are sharks and big fish that live 25 or 30 years.

It's slow to reproduce and slow to metabolize, basically just maintaining biomass.

The surplus of the lower organisms is enough to maintain a biomass that fluctuates less.

acts like a capacitor

CA: It's a very interesting story.

The food pyramid has to change completely.

(Enric) At least for the sea

An inverted pyramid on a coral reef is like five lions for every wildebeest in the Serengeti.

Doesn't work on land

Coral reefs, at least, are the lowest constituent systems.

we think this is universal

But the study of pristine coral reefs has only recently begun.

CA: The numbers you showed today were amazing.

$35 billion of money spent on subsidies -

On the other hand, for $16 billion, we can turn 20 percent of the ocean into marine protected areas -- it's a viable option, and for fishermen, of course.

If the world was smart, we could solve the problem for $19 billion less than it is today.

That $19 billion can be spent on health insurance and other things.

CA: We have a sluggish fishery, $50 billion.

The big solution is for WTO subsidies to transition to sustainable practice.

CA: A lot of examples have been presented to stop subsidies that have gone off the rails.

Thank you for introducing me to these numbers.

One last personal question

Many of us here have been associated with the ocean for a long time, and it can be a daunting experience to see a once beautiful ocean degrade and continue to degrade.

Tell me how you feel about the experience of going to pristine waters and seeing resurrection

(Enric) It's a spiritual experience.

You go there to understand the ecosystem, to measure and count the fish and sharks, and see how different the place is from what you know.

But the best feeling is what E.O. Wilson calls the love of life, the sense of awe and wonder that humanity has in the face of nature as it is.

There, alone, you feel part of something bigger, part of a larger global ecosystem.

Without a place to find this hope, I wouldn't be able to continue this work.

otherwise I'm too worried

(Chris) Enric Thank you for sharing your spiritual experience. Thank you.

(Enric) Thank you very much.

Remember something you love: a movie, an album, a song, a book, etc. Suppose you really recommend it to someone who likes it.

As a preface, this is exactly what happened to me every day for six years. I'm a high school math teacher.

They sell things to people who don't need them because it's the law.

It's a failed business

I have a student paradigm that's useful to illustrate, and it might apply to you as well.

Let's say you take Algebra II's final exam, and I think the pass rate is less than 25%.

This speaks more to the state of math education in America than it does to you and your students.

First, divide mathematics into two

One is calculation. i think you forgot

For example, the factorization of a quadratic equation with a leading coefficient greater than 1.

Problems like this are easy to remember once you've got the basics of mathematical reasoning, the application of mathematical processes to the world, which is hard to teach.

It's something I want my students to master, whether they want to do math or not.

In today's American teaching

you won't get it first

Today's topic is what can be done about that kind of education, and I'll also touch on why this is an amazing time for math teachers.

Here are five signs that math is being taught the wrong way in school.

One is lack of initiative and does not learn on its own

As soon as I finished explaining, five students raised their hands and asked me to explain everything again.

I lack patience

I don't even have a good memory.In 3 months, I'll explain everything again.

There is also an aversion to word problems, 99% of students do.

The remaining 1% are trying hard to see if the formula fits.

I can't even look at it

"Deadwood" creator David Milch explains this well.

He stopped making contemporary plays set in modern times, and he said that watching "Charlie Sheen's Harper Boys" for four hours a day set up a special neural pathway that would lead you to expect simple problems.

It's what he calls "an indecisive frustration."

I can't stand things that can't be fixed right away

I want a sitcom style that solves problems in 22 minutes, with 3 commercials and laughter.

As I said, the problems worth solving are not simple.

What worries me is that in the future I will live under the command of my students.

You're doing something that doesn't serve your own future and well-being, while teaching

If current textbooks, especially national textbooks, teach mathematical reasoning and problem solving, it's like watching "Harper Boys."

(Laughter) Now here's an example. physics textbook

applies to mathematics

The first thing I want you to see is these three pieces of information, and each one of them eventually becomes a formula, and ultimately the student uses it to do the calculations.

not in real life

What kind of problems have you solved that are worth solving? If you have all the information. If you had extra information, you would have sorted it out.

there is no such thing in a worthwhile problem

Textbooks also hinder students' ability to think. it's an exercise

When it comes time to tackle the problem, I have this problem in front of me, I've just fiddled with the numbers and the content a little bit.

If you still don't know the source of the question, they will kindly give you an example with the formula.

That's how you literally go through one unit. You don't learn physics at all, you just learn where things are in textbooks.

Let's look a little more concretely in terms of mathematics.

here is a convenient problem

Find the slope angle and slope length using a ski lift

It's a four-step process. Does anyone know what those four steps are? They're condensed and presented to the students at once, and that's where the tantalizing problem-solving happens.

Let's actually solve it. there is a diagram

You also have basic knowledge of mathematics: grids, lengths, names, points, axes.

You also know how to divide and think, which part is the most difficult?

I think I can see the story

We take the form of leading questions and answers, but we pave the way from question to question, and reward those who successfully step over the small cracks along the way.

that's just the way it is

If you take these things apart in a different way and put them back together with your students, it's an ideal way to solve problems.

Let's start with this diagram I'm going to ask you a quick question, which part is the steepest?

I'm going to cut it this way because it seems like there are two answers.

So let's have them argue with each other, and have friends pair up and take notes.

Then you realize that the skier is just an eyesore, in the bottom left of the screen, or a little above the middle.

I also feel that if A-D had names, it would be easier to talk about.

When you start defining what a gradient means, you realize that you just need a number to base it on.

Only then do I throw in a mathematical way of thinking.

Mathematics is useful for argument, but argument is not useful for mathematics.

9 out of 10 classes are ready for the problem at that point

Students can come up with their own small steps if they want.

This creates patient problem-solving, mathematical reasoning.

It was clear in my practice

Here, Einstein has the right to speak.

He says problem formulation is key, but in my classes in the United States, I just give students problems, and they don't get involved in problem formulation.

We spend 90% of our five hours of prep time per week picking highly guiding problems from textbooks and restructuring them into mathematical reasoning and problem-solving exercises.

that's what it is

good question about water tank

how long does it take to fill

Eliminate small steps first

students have to think and formulate themselves

you'll find that you need all the information there

Nothing gets in the way of your answer

This is where the students think: does height and size matter?

What color is the bulb? what is important here

not presented in the curriculum

here is the water tank

time to fill? That's all

Now, in the 21st century, we see the real world as it is, not the line art and clip art you see in textbooks. We go out and take pictures.

dealing with reality

how long does it take to fill

It would be even better if you took a video of someone filling the tank.

maddeningly slow

I am bored

A student is looking at a clock, and at some point they think, "Hey, how long is this going to take?"

(Laughter) And that's how I got into the problem.

Now here's where it gets really interesting. As I said at the beginning, I'm inexperienced, so I'm teaching the most retarded kids.

Some kids don't participate in math talk because someone knows the formula and knows how to use it better than I do, so I don't talk about it.

But here we all have the same intuition.

We've all filled things with water, so let your child tell you how long it takes.

Some children are not good at math or conversation and are afraid to get involved.

So you write a name on the board, let them guess, and they bite you.

then go through the process

The best thing about this method is that you don't get the answer from the model answers at the end of the teacher's manual.

I would watch the end of the video instead

(Laughter) This is terrifying. If you have a theory model that always works with the model answers in the manual, that's fine.

Still, conversations in class are the most valuable

The students had fun learning, the kids who got the virus on the first day of class.

It's the new semester, and when I write something completely new, something I've never seen before, on the board, we discuss it for three or four minutes longer than at the beginning of the school year, and it's really fun.

I don't hate word problems anymore 'cause I've redefined what they are

I'm not afraid of math anymore, because I'm slowly redefining it.

this is great

Mathematics teachers should use multimedia because it brings the real world into the classroom, in high resolution and full color.It lets them develop intuition on the same terms.Have them ask the shortest possible questions.Have specific questions come up in discussions.Have students create problems themselves.

The reason it's great to be a math teacher now is because you have a quality curriculum tool.

It's ubiquitous, it's cheap, and it's so cheap and easy to get this tool that's freely distributed under an open license.

I posted a video series on my blog and it got 6,000 views in two weeks.

A teacher in one country emailed me and said, "Great. It's been a fruitful discussion.

By the way, how about improving it like this?" Great suggestion

I recently blogged about this question, which checkout line at the store? People with 19 items in one cart, and people with 3, 5, 2, 1 items in 4 carts.

This linear model can be used in the classroom, and I was on "Good Morning America."

What I can conclude from this is that it's not just students, it's people who crave these things.

mathematics makes sense of the world

Mathematics is an expression of intuition

No matter what your stake in education is, whether you're a student, a parent, a teacher, or a politician, I want you to create a better curriculum.

I need a patient problem solver

I have a daughter named Mulan

Last year she was eight years old, and she had a school report, or rather, a homework assignment about frogs.

At a restaurant, she said, "Basically, frogs lay eggs." "Eggs become tadpoles." "Tadpoles become frogs."

I say, "Well, I don't know much about frog reproduction."

"I think the female lays the eggs." "So the male fertilizes the eggs."

"An egg becomes a tadpole and becomes a frog"

My daughter says, "Huh? Only females lay eggs?"

I answer "yes"

My daughter continued, "So what is fertilization?"

I roughly replied, "Oh, from a father frog and a mother frog." "Necessary to make new frogs."

I thought, "Yeah, yeah, here we come."

I never thought this time would come at the age of 8

I tried to remember all the textbooks, and all I could remember was, "Answer only what children are asking."

"Don't give away too much information." So I said, "Yes."

Then she said, "Where, where are the human females?" "Where do they lay their eggs?"

I say, "Uh-huh." "It's funny to hear that."

"I have a pond inside my body."

"The eggs will be laid there." "No need to worry about other eggs or anything else."

"It's my pond, so that's why."

Then she said, "How do you fertilize an egg?"

So I said, "Yes, through the man's penis." "Ejaculate through the woman's vagina."

"I will fertilize you."

We're actually eating and she's stunned and says,

"Mommy! Is that like going to the bathroom?"

I answer "yes yes like that"

"I see"

(Laughter) That's how it evolved.

It's like the landfill is right next to the amusement park.

It's a bad arrangement...but she continues, "Huh? What?"

"How can you do that?"

There I played Margaret Meade

"Human men and women can have a special relationship." "So when they are much, much bigger than you."

And she says, "Mama."

So I answer "yes"

Then she said, "But mama can't have children."

I know I'm infertile and she's adopted

and I say yes

Then she said, "Then you don't have to do that anymore."

My answer is "..."

Then she said, "But how can that happen when men and women are naked?"

"How do you know when it's time?"

"Mommy, man."

(Laughs) "Great answer"

"That's right."

In the car on the way home My daughter looks out the window and says, "Mommy, if two people meet on the street."

I said, "No, humans are very private."

"That's not true."

And she said, "Well, there are a lot of men and women." "Assuming there was a party."

"Is there such a thing?"

I say "no no"

"Humans don't do things like that."

And when we got home and she saw our cat

I say, "Oh, same, basically the same."

She tangled her legs and said, "But mom, what about your legs?"

"I don't know about legs."

Continuing, "Not everyone can split"

And I say, "Yeah, but my legs..."

Try to say "I'll do something about it"

My daughter said, "But I have no idea."

So I said, "Okay, let's look it up on the internet." "Maybe you can find something... on Wikipedia." I went on the internet and searched for "cat mating."

Unfortunately there are several videos on Youtube

Luckily she saw them and just said, "Wow, that's great."

But then, "What about the dog?"

So we search for "dog mating" and watch videos and she's hooked.

The daughter continued, "Mom." "Human mating on the Internet."

(Laughter) And then I found myself channeling my eight-year-old daughter into Internet porn, and I looked into her innocent, lovely face and said, "Oh no."

"It can't be."

thank you

(Applause) Thank you for your attention.

(Applause) Thank you. It was a lot of fun.

(music) (singing) I kept walking, trying to catch my breath

and i found you

you walked slowly step by step

"Hey I'm depressed

I don't know where to go

"If you're lost I'll sing a song with you so you can move on

let's walk while singing

Where shall we go? where shall we go?

She said "I'm looking for a safe place

a place i can call my home

I've been walking all night and still can't find the house

"There's only one way to find it, where the heart is

I believe I can get there, but I have to keep walking straight

Straight

Straight

thank you

(Applause) How are you? Are you having fun?

(Cheers) Great Can you sing with me for a minute?

can you sing something Make a D sound

Sing "Ooh"

(audience hums) Louder, more, more

(song) Oh

Then someone who can sing "Oh oh oh"

(Audience) Oh oh oh

(Collier) Whoa oh oh

(Audience) Whoa oh oh

(Collier) Sing "Whoa oh"

(Audience) Whoa oh

(Collier) Oh oh oh

(Audience) Oh oh oh

(Collier) "Whoa oh oh"

(Audience) Whoa oh oh

(Collier) Sing "Whoa oh oh"

(Audience) Whoa oh oh

(Collier) Whoa oh oh

(Audience) Whoa oh oh

(Collier) Sing "Whoa oh oh"

(Audience) Whoa oh oh

thank you nice thank you

(Applause) Thank you.

did you feel the movement?

Did you feel something moving inside that you were part of the movement?

Harmony is a very beautiful term.

It's also a non-verbal way of navigating emotional frameworks, and as with many other languages, it's not about how skilled you are at it.

Not how many words you know, not how many phrases you know

I think it's about what kind of emotion you put into that expression.

So I want to cherish this idea as a community, because it's about walking towards our humanity, instead of walking away from it.

thank you

(Applause) (music) (singing) Take me wherever you want to go

my love is strong

in my hideout

Gently, like the calm after a storm, I've found what I've been looking for

in my hideout

Even if I close my eyes, darling, even if you get lost, I'm on my way to hideout

Touch me, as if you were loved for the first time, in my favorite place, in my hideout

I know where the wind blows I have a place in my hideout

in my hideout

No matter what happens, I can't hide from you anymore

Just in time I found what I've been looking for

I heard your voice calling me

Heading there where I can be free

Even if she doesn't wait for me

After I put on these shoes and got to know you, I traveled to many places

I feel like I love you, you know

I've always wanted to know you

you make me complete because i love you

thanks to you i'm yours

１、２、３、４、５

(Thank you for applause

(Applause) Thank you.

Thank you everyone

(Kelly Stotzel) OK Jacob wow

OK, I have a few questions. (Collier) Here you go.

(Stotzel) It was great.

(Collier) Thank you Kelly

(Stotzel) The background footage was drawn in real time, right?

CA: Yeah, all the visuals are happening in real time in response to music and words.

If you cue a loop and play an instrument, for example, the tree in the video, it responds to long sounds and grows long, thick branches.

When I sing, it turns into the wind and blows on the trees

(Stotzel) You're 22. (Collier) Yes.

(Moderator) So you played everything yourself?

Tell me about how it all started and what happened up until now.

COLLER: I have a special room in my house in North London, and there's people from there --

(Cheers) Thank you, people of North London.

And this room is— it's my parents' house.

I grew up in a room full of instruments, but more than that, my family encouraged me to pursue my imagination and told me that what I wrote and made was good.

This room was like my heaven, and the theme of the album tour was "In My Room."

(Stotzel) This is exactly your room, isn't it?

(Collier) It's very similar to my room, creating sounds on the fly and being free, and I think that's what music and good ideas are all about.

(Stotzel) You won two Grammys for it on a record you made alone in your room

How did you do that? Five years ago, I don't think I could have done that.

(Collier) As the world progresses

Creators hold the power, and I think you'll agree, it's old fashioned for music industry magnates to hold power.

I wish I had a good idea

I'm here at TED right now and I'm talking to people who know this, and someone has a good idea, and you just plant the seeds.

It's the person who brings the idea to the world.

Yes, I made this album all by myself Don't wait for someone to say, "Why don't you make your own album?"

I just did it without thinking about what anyone would think of me. It was a huge bonus to win two Grammys.

(Applause) (Stotzel) Thank you Jacob (Collier) Thank you.

(applause)

Bring back “care” to healthcare

I've worked in the health care field for the past 15 years, and one of the things that drew me to this field was my interest in the "care" in our health care system, or more precisely, the invaluable role played by caring caregivers.

Now, how many of you here call yourself a caregiver?

How many of you have cared for people who are sick, injured or disabled?

Raise your hand if you agree

about half of the total

I want to thank all of you who have raised their hands just now for the time you spent caring for them.

your deeds are invaluable

I myself used to be a care recipient.

As a teenager, I had Lyme disease and was treated with antibiotics for 18 months.

I've been misdiagnosed many times, with various diagnoses, including bacterial meningitis and fibromyalgia.

the doctor didn't know

I am standing before you today because I had a tenacious, dedicated caregiver who saved my life.

He did everything he could, driving long distances and visiting treatment centers to find the best treatment, and most of all, he never gave up, despite all the challenges he faced, from work to quality of life.

that person was my father

I owe my recovery to my father's dedication.

This experience inspired me to help patients.

The more I looked into it, the more I realized that many caregivers were doing the same kind of support that my father did, and they were playing an integral role in the healthcare system.

I don't think it's an exaggeration to say that without unpaid caregivers like my father, our medical and social systems would collapse.

Nevertheless, unpaid caregivers have not been evaluated.

I am currently caring for my mother remotely, who has multiple chronic illnesses.

Now more than ever, I am keenly aware of the urgent need that caregivers face.

With an aging society, an unstable economy, pressures on health care systems and an increase in illnesses that require long-term care, the importance and demand for family caregivers has never been greater.

Many caregivers around the world are sacrificing their physical, financial and psychological health to care for their loved ones.

Caregivers themselves have their own limitations and needs, and without the right support, many will reach the limits of their patience.

Once considered a private affair in family life, unpaid caregiving has become an invisible pillar of health care and social systems around the world.

We've already confirmed that there are many caregivers in this place alone.

What kind of people are they and how many are there?

What are the challenges they face?

Beyond that, how can we ensure that they are recognized as important to patients, to the healthcare system, to society?

In fact, anyone can be a caregiver. There's a 15-year-old girl caring for a parent with multiple sclerosis. There's a 40-year-old man who has a full-time job but cares for family members who live far away. There's a 60-year-old man caring for his wife with terminal cancer.

There are many things caregivers do for their patients.

I also take care of myself. I help you get dressed, feed you, accompany you to the bathroom, help you move.

They also provide critical medical care, because caregivers often know more about the symptoms and needs of their loved ones, sometimes than the patients themselves, who may have paralysis or be confused about their diagnosis.

In those situations, the caregiver also becomes an advocate for the patient.

And most importantly, caregivers also provide psychological support.

Manage hospital appointments, manage household finances, and do daily household chores.

These difficulties cannot be ignored

More than 100 million caregivers currently support 80% of all caregiving in Europe.

Even though this number is impressive, it's probably smaller than it should be given the lack of awareness of caregivers.

As we've already seen, a lot of people here weren't quite sure if it was okay to call themselves a caregiver.

Many of you would have thought that I was talking about a medical profession, such as a "nurse."

Even more striking is the range of benefits caregivers bring to society.

Let me give you an example from Australia in 2015.

The annual value of care provided by unpaid caregivers to people with mental illness was estimated at A$13.2 billion.

That's nearly double what the Australian government spends annually on mental health care.

These numbers and other data show that if caregivers stop providing care tomorrow, the health care system and the social system will collapse.

Despite the undeniable importance of these millions of silent caregivers, they are largely unrecognized, both by governments and health care systems and by private companies.

In addition, caregivers have major personal problems.

Many caregivers can face high expenses and financial hardships because they are unable to work full time or continue to work.

Numerous studies show that caregivers sacrifice their own health and well-being to care for their loved ones.

Because many caregivers spend so much time caring for their loved ones, families and relationships often take a toll.

Many caregivers report that employers do not have adequate policies to support caregivers

But perceptions of caregivers are improving around the world.

Just a few years ago, an organization called the International Association of Caregivers' Organizations (IACO) brought together caregiver organizations from around the world to provide systematic direction, encourage information sharing, and actively promote caregiver awareness on an international level.

Private companies are also beginning to recognize the caregiver situation.

I'm proud to say that my own commitment and enthusiasm for the topic of caregivers has paid off in the workplace.

The company I work for is tackling this problem and has developed an unprecedented framework for employers and society at large.

The goal is to empower caregivers -- to improve their own health and well-being and bring a better balance to their lives.

However, much more needs to be done to compensate for these relatively uncommon efforts.

Our society faces an increasing health care burden, with an aging population, an increase in cancer and chronic diseases, and widening social inequalities.

To meet these challenges, policymakers need to look beyond traditional health care and employment policies to recognize that unpaid caregiver care will become the cornerstone of long-term care.

Caring for someone should be a personal choice, and someone's well-being shouldn't be weighed against it.

In order to bring back care in the true sense of the word, we need fundamental and social structural reforms.

You can't do this without changing your mindset.

let's start today

We can sow the seeds of change for the tens of millions of caregivers around the world today.

Let me suggest to you, when you get home today, or when you come to work tomorrow morning, give your caregiver a hug.

Thank them and offer to help out a little, or even offer to take care of them yourself for a few hours a week.

When caregivers around the world feel valued, not only do their health and well-being improve and they feel more fulfilled, but so do the lives of those they care for.

Take care of each other more

thank you

(applause)

Hello

There's a medical revolution happening all around us that will help us fight cancer and many other diseases that society fears most.

That revolution is called angiogenesis, and it's based on how the body grows more blood vessels.

Focus on blood vessels

Because the human body is literally filled with blood vessels, which are about 100,000 kilometers long for the average adult.

Connected in a straight line, it's long enough to circle the earth twice.

The smallest blood vessels are capillaries

There are 19 billion capillaries in the body

Capillaries are vital to life, but as you'll see, they can also be death vessels.

The amazing thing about blood vessels is that they adapt to whatever environment they enter.

In the liver, it creates channels for detoxifying the blood, and in the lungs, it surrounds the alveoli and exchanges gases.

In muscles, they are spiral so that they can contract without impeding blood circulation.

Inside the nerve, they run parallel like wires.

most of the blood vessels are made in the fetus

Because as an adult, except in rare circumstances,

blood vessels are not normally formed

In women, blood vessels grow each month to form the lining of the uterus.

During pregnancy, the placenta forms to connect the mother and fetus.

When you're injured, blood vessels are created under the scab to heal the wound.

It looks like this: Hundreds of blood vessels running toward the center of the wound.

The body has the ability to regulate the number of blood vessels present at any given time.

They secrete stimulators and inhibitors of angiogenesis to fine-tune their regulation. When the body needs more blood vessels, it secretes stimulants to create more blood vessels. Proteins called angiogenic factors act as natural nutrients to help new blood vessels sprout.

When the extra blood vessels are no longer needed, the body secretes angiogenesis inhibitors to cut back to baseline.

Sometimes you need to add more blood vessels to get back to normal from below baseline, for example after an injury.

But what we now know is that in some diseases, this system is flawed, unable to cut back excess blood vessels or grow new blood vessels in the right places and at the right times.

Under these circumstances, angiogenesis is in an unbalanced state.

When angiogenesis is out of balance, a number of diseases emerge.

Inadequate angiogenesis, or lack of blood vessels, results in delayed wound healing, heart attack, poor circulation in the legs, death from stroke, and nerve damage.

Conversely, when there's too much angiogenesis, too many blood vessels can lead to diseases like cancer, blindness, arthritis, obesity, and Alzheimer's disease.

Altogether, there are more than 70 major diseases that afflict more than a billion people around the world, and although they may look like different diseases on the surface, they all share abnormal angiogenesis.

This realization suggests that we can treat these diseases by controlling angiogenesis.

I'm going to focus on cancer here, because angiogenesis is a hallmark of all cancers.

let's get started

Those dark gray, ominous blobs are brain tumors.

Under a microscope, you can see hundreds of capillaries carrying oxygen and nutrients to cancer cells.

But when cancer occurs, it's different.When cancer occurs, there is no blood supply.

They arise as tiny nests of cells, measuring only 0.5 cubic millimeters in size.

It's the tip of a ballpoint pen

Without a blood supply, it doesn't get enough oxygen and nutrients to grow.

In fact, our bodies create cancers like this all the time.

Autopsy studies of people who died in car crashes show that about 40 percent of women between the ages of 40 and 50 had microscopic breast cancers.

About half of men in their 50s and 60s have microscopic cancers of the prostate, and virtually all of us will have microscopic cancers of the thyroid by the time we're 70.

But without a blood supply, most of these cancers never become malignant.

My teacher, Dr. Folkman, a pioneering authority on angiogenesis research, called it "cancer, not a disease."

The body's ability to balance angiogenesis, when working properly, prevents blood vessels from growing cancer.

It turns out that this is the most important defense mechanism against cancer.

If you block angiogenesis and prevent blood vessels from reaching cancer cells, tumors can't grow.

But once angiogenesis begins, cancer cells grow rapidly.

This is how cancer cells become lethal.

Cancer cells mutate and release large amounts of angiogenic factors, which are natural nutrients, in an attempt to create blood vessels for nutrition.

Once these blood vessels form, cancer cells can grow and invade surrounding tissues.The same blood vessels that nourish tumors allow cancer cells to escape into the circulation and metastasize.

Unfortunately, most cancer patients are diagnosed with cancer at this late stage, when angiogenesis is already on the rise, and cancer cells continue to grow unchecked.

So if angiogenesis is the dividing line between benign and malignant tumors, one of the key elements of the angiogenic revolution is new ways of treating cancer by interrupting the blood supply.

It's called antiangiogenic therapy, and it's completely different from chemotherapy.

This is possible because the blood vessels that feed tumors are different from healthy blood vessels. Tumor blood vessels are abnormal and fragile in structure, so targeted therapy can help.

We've given real cancer patients an experimental drug against glioma as an anti-angiogenic treatment, and we see dramatic changes when the blood vessels are blocked.

This woman has breast cancer and is being treated with the anti-angiogenic drug Avastin, which is FDA-approved.

You can see that the blood flow that was driving the cancer is gone after treatment.

Anti-angiogenic therapy worked against both of these cancers.

A few years ago, I asked myself if I could take this one step further and use it to treat cancer in other animals.

My name is Milo, my boxer dog is 9 years old and he has a very aggressive malignant neurofibroma on his shoulder.

metastasize to the lungs

The veterinarian gave me three months to live.

We put a mixture of anti-angiogenic drugs in the dog's food, and we also made anti-angiogenic creams to apply to the tumors.

Within a few weeks, we were able to confirm that the cancer had slowed down, extending the life expectancy of the veterinarian by a factor of six, while still living a fulfilling life.

Over 600 dogs have since been treated

The response rate was about 60 percent, and we were close to euthanizing them -- it extended the life of our pets.

I'll show you some more interesting examples.

I'm a 20-year-old dolphin in Florida. A scar in my mouth turned into invasive squamous cell carcinoma over the course of three years.

So we made an anti-angiogenic paste,

I applied it to the cancer three times a week

Within seven months, the cancer was completely gone, and the biopsy was reported as normal.

This is a horse named Guinness with cancer on his lip.

It's a deadly cancer called angiosarcoma.

It had already spread to the lymph nodes, so I treated it internally and externally with anti-angiogenic skin cream and oral medications.

After six months of treatment, the cancer was in complete remission.

This is Guinness and the happy owner six years later.

(Applause) Clearly, anti-angiogenic therapy works for a wide variety of cancers.

Pioneering treatments for humans and dogs are already available.

There are 12 drugs for 11 types of cancer.

But as a practical matter, I'm concerned about clinical efficacy.

This is cancer patient survival data, covering eight types of cancer.

This bar shows survival times when chemotherapy, surgery and radiation were the only treatments available.

But since anti-angiogenic therapy first appeared in 2004, survival has increased by 70 to 100 percent, in patients with kidney cancer, multiple myeloma, colorectal cancer, gastrointestinal stromal tumors.

it's great

Other tumors and cancers did not show as much improvement

I kept asking why I didn't get better grades.

The answer is clear to me: cancer is often treated too late and has metastasized.

I'm a doctor, and once the cancer reaches the terminal stage, it can be difficult, if not impossible, to beat.

So I went back to the biology of angiogenesis and started thinking about whether the answer to cancer would be to turn the strategy of cancer cells against them to stop them from growing and to stop their growth.

This will help healthy people and people who have already beaten cancer and want to prevent it from coming back.

To find a way to block angiogenesis in cancer, I looked at the causes of cancer.

What was interesting to me was that food accounted for 30 to 35 percent of the cancer-inducing environmental factors.

The obvious thing here is to consider what you can remove from your diet.

But I did the exact opposite and started thinking about what I could add to my diet, something that's naturally anti-angiogenic, and that boosts the body's defense system to attack the blood vessels that breed cancer cells.

That is, can you eat what makes cancer starve?

(Laughter) The answer is yes.

For this study, we looked at markets and farms and spices, and what we discovered was that nature has a lot of anti-angiogenic substances in food, drinks, and herbs.

we developed a test system

Blood vessels radiate out from the central ring.

We're using this system to test the levels of food factors that we can achieve by eating them.

I'll show you what happened when I put red grape extract in it.

The active ingredient is resveratrol, which is also found in red wine.

Suppresses abnormal angiogenesis by 60%

When strawberry extract is added, angiogenesis

strongly suppressed

and soybean extract

This is a growing list of anti-angiogenic foods and drinks that we want to study.

Each food has different effects depending on the strain and variety.

The reason we measure this is that when we eat strawberries or drink tea, we want to choose the kind with the highest anti-cancer properties.

We experimented with four types of tea.

Jasmine tea, sencha, earl gray, and the blended teas we made.

Interestingly, when I blended two teas that were less potent, they were more potent than either one alone.

synergistic effect of food

data from our test

I've recreated tumor angiogenesis in the lab, shown as a black line.

It is possible to examine the effect of anticancer drugs

Shorter lines mean less vascularization, which is preferable.

This common drug has been found to reduce the risk of developing cancer in humans.

Statins, non-steroidal anti-inflammatory drugs, and several other drugs inhibit angiogenesis.

Here's a dietary factor that has similar effects to those drugs.

You can clearly see the effect, in some cases stronger than the actual drug.

soybeans parsley garlic grapes berries

You can make delicious dishes using these foods.

Imagine that we created the world's first food rating system based on anti-angiogenic, anti-cancer effects.

We are now on the way to making it happen

So much for the research data, but the important question is, what can we confirm from people eating certain foods that stop angiogenesis in cancer?

The best example I know of is a 20-year follow-up study of 79,000 men who found that men who ate cooked tomatoes several times a week had up to half the risk of developing prostate cancer.

Tomatoes are rich in lycopene, and lycopene is an angiogenesis inhibitor.

What's even more interesting about this study is that men who developed prostate cancer who ate more tomato sauce also had fewer blood vessels feeding the cancer.

This study in humans is a great example of how anti-angiogenic substances found in food, when consumed realistically, can have an impact on cancer.

Now, we're working with Ornish of UCSF and Tufts University to study how a healthy diet affects angiogenesis markers in the blood.

What I showed you clearly has broader implications beyond cancer research.

If we're right, it affects consumer education, food service, public health, and even insurance companies.

In fact, some insurers are beginning to think in this direction.

Look at this insurance company's ad

For many people around the world, a cancer-fighting diet may be the only viable solution because terminal cancer treatments are expensive, but everyone can benefit from a healthy, local, sustainable diet made from anti-angiogenic crops.

And finally, I've talked about food and about cancer, but I have to add one more thing: obesity.

Because it turns out that adipose tissue is highly dependent on angiogenesis.

Like tumors, the more blood vessels, the bigger the fat.

So can we shrink adipose tissue by cutting off the blood supply?

The top line is the weight of a genetically obese mouse, a mouse that eats until it's fat like a tennis ball.

(Laughter) The bottom line is the weight of a normal mouse.

When obese mice are given an angiogenesis inhibitor, they lose weight.

Weight regains when treatment is stopped and weight loss when restarted

If you stop treatment, you will gain weight again.

Just suppressing angiogenesis causes weight to go up and down

The same approach that we use to prevent cancer may also apply to obesity.

And what's most intriguing is that you can't drop the weight of an obese mouse below the weight of an average mouse.

You can't make a mouse that looks like a supermodel.

(Laughter) What this means is that angiogenesis plays a role in regulating healthy baselines.

St. Gyorgy once said, "Discovery is born when everyone sees what they see and thinks what no one thinks."

I hope you've realized that in cancer, obesity and other diseases, attacking their common denominator, angiogenesis, can be very powerful.

this is what the world needs right now

thank you

(Applause) (Cohen) I have a question.

These drugs are not currently the mainstay of cancer treatment.

What do you recommend for cancer patients?

Would you recommend such treatment?

LEE: There are several anti-angiogenic treatments that have been approved by the US Food and Drug Administration that you should definitely consider if you have cancer or work with cancer patients.

There are many clinical trials

We know that about 300 companies are developing about 100 biologics.

So think about approved drugs, keep an eye on clinical trials, and think about what you can do instead of relying on doctors.

So this is one of the themes I talk about, and it's about getting people to do things that doctors can't do. Use knowledge and take action.

If nature is giving us a clue, there may be a new future for the value of what we eat. Our diet is three times a day of chemo.

COHEN: So, are you suggesting that people who are at risk of developing cancer should take cancer-preventive treatments, or should they just try to eat right, like eating more tomato sauce?

LEE: There's plenty of epidemiological evidence, because we're in the information age, and it's easy to find solid sources of information, like the National Library of Medicine's database, where you can find epidemiological studies on diet-based and non-prescription-based cancer risk reduction.

this is something anyone can look up

(Cohen) Thank you.

(applause)

September 10th, the morning of my 7th birthday My mother was in the kitchen washing the dishes My father was reading the newspaper When they saw me they said 'Happy birthday' 'I'm 7'

My dad smiled and said, "You know what it means to be seven?"

“Eating cake and receiving presents?”

7 years old is the age of discernment, and it is possible to sin against God and man.”

lol

In my sophomore class, my sister said, but what she said was

It sounded like excitement about preparing for the first sacrament or confession I thought it was about wearing a white dress and wearing a veil

Because I've never thought deeply about the expression "sensible age"

I said "tell me again"

My father said, "In the Catholic Church, God knows that little children can't tell right from wrong, but when they're seven years old, they'll be able to tell the difference.

God will start keeping a permanent record of you."

(Laughter) "Yeah, but wait, I've been a good boy all this time.

Did God not notice? ”

"No, I was aware," my mother said.

(Laughter) I thought, 'Why

Didn't you know that before? There's no point in being a good boy

It's the worst that I didn't know such important information until the day it became meaningless

"So Santa is a good boy?

You know I'm a bad boy, right? " and me

Dad said, "I think it's only between Thanksgiving and Christmas."

My mother said, "Dad, let me tell you

This kid is seven years old, there's no Santa

(Laughter) Actually, I wasn't too surprised by this.

I thought it was too much of a story In a normal house, Santa would deliver presents on Christmas Eve night and open them first thing the next morning, but my parents had consulted with Santa beforehand, so Santa arrived late.

The time to come is 9 o'clock in the morning of Christmas when the big mass is held, but if you're not a good boy, you won't come.

i thought it was so weird

It was clear that my parents were preparing presents

My father's packaging was unique, and my mother's and Santa's handwritings are identical.

And it's weird that Santa goes around everyone's house and comes all the way home

There's only one solid conclusion to draw from all the evidence Our house is so strange that not even Santa will come My parents tried their best to protect us from the embarrassment of being rejected by a merry Santa But even Santa only gives presents to good children

So in a way, it was reassuring to know that Santa was fictitious.

I left the kitchen without much of a shock, but I was really dumbfounded that I didn't know the age limit.

It doesn't work for me, but I can use this information - someone can tell me.

There are two criteria for that: you must be able to understand the concept of separation age and be under seven years of age.

My brother Bill is six years old

My brother was playing on the neighborhood school playground, it was a Saturday.

To my younger brother who was playing kicking a ball by himself

I ran up and said

"I understand now that the age for judging is 7 years old. At 7 years old, there is a possibility of committing a crime." "So what?"

Until then, no matter what you do, God won't notice."

"So?" said the brother, "You're an idiot!"

I thought I'd run home, but I got angry

At the top of the stairs, I looked back suggestively, "Speaking of which, there's no Santa Claus."

(Laughter) I didn't know it at the time, but I didn't turn seven on September 10th.

I planned a sleepover for my 13th birthday, but a few weeks before that, my mom called me and said, 'I have something to tell you.

My birthday is October 10th, not September 10th.” “Huh? ”

(Laughs) “Children born before September 15th are supposed to enter kindergarten.”

(Laughter) "That's why I said my birthday is September 10th. Because I don't want you to spread it all over the place, I started saying that my birthday is September 10th."

But you were ready.”

When I was four, I was already the oldest of four and my mother was pregnant with the fifth, so what she meant was that she was ready, so she said

"Don't worry, every October 10th birthday

You didn't realize it, but I was feeding you cake."

(laughs) Are you happy or what?

While I was there, my mother celebrated her birthday without me.

What upset me when I heard this wasn't about changing the date of the sleepover.

I wasn't actually a Virgo

I have a big Virgo poster in my room

I read the horoscope every day, and the fortune-telling was a big hit

(laughs) You mean I was a Libra?

So I went to buy a Libra poster

The poster for Virgo is a picture of a long-haired beauty relaxing by the water, but for Libra, it's just a giant scale.

At that time, I was growing up faster than other children, so honestly, I felt ominous and depressing that the sign was the scales.

(Laughter) But when I bought a new poster and started reading Libra horoscopes, I was surprised because it fit me so well.

It took me a while to remember when I remembered the stories of sensibility and birthdays, and when I thought I was seven, I realized I was actually only six.

I had a month of free time before I started wearing them.

oh life is cruel

One day, two Mormon missionaries came to visit.

I lived in a busy part of LA, so that's where the sales and solicitors started going round the house.

A lady from the Seventh-day Adventist church brought a picture of heaven

I've had teenagers come and tell me that if you give me a subscription to a magazine, I'll become a gangster and I won't rob you.

That's why I usually use Izumo, but I left on this day.

Two boys, about nineteen years old, in starched white short-sleeved shirts, stood with little name tags that said they were representatives of The Church of Jesus Christ of Latter-day Saints.

“A message from God to me?” “Yes.”

I have a lot of Latter-day Saints—I grew up on the Pacific coast of America, so we've worked together and even dated.

I think it's rare to go up to the house (laughs)

I asked them to sit down and I gave them water

you shouldn't touch your hair

(Laughter) You can't stand a video of yourself in front of you and not touch your hair.

(smile)

I sat them down and offered them water, and after a little conversation, they asked me, "Do you believe God really loves you?"

In my heart, I said, "Of course I believe in God, but the word heart gets in my way. It anthropomorphizes God. And I don't like treating God as 'he'."

But I didn't want to fight over meaning, so after a long, awkward silence, "Yes, I feel deep love."

They looked at each other and smiled as if it was a model answer.

“Do you believe that all humans are brothers?” “Yes, I do.”

I was relieved to have a question that could be answered immediately

"I have a story to tell you"

They said they were in Jerusalem in 600 B.C. They started talking about a man named Lehi.

At that time men, women, children, babies and fetuses

everyone was evil

Lehi received the revelation, "I'll get you out of here if you put everyone in the boat."

You say you moved to America

“Came to America from Jerusalem in 600 B.C. by boat?”

"that's right"

(Laughter) For 600 years, Lehi and his descendants multiplied and divided into two races: the Nephites and the Lamanites.

After Christ was crucified, on his way to Heaven, he stopped in America to visit the Nephites.

(Laughter) He said that if every Nephite was good, he would let the evil Lamans win the battle.

But someone ruined it The Lamanites killed all the Nephites

But there was a man named Mormon who survived by hiding in the woods.

I heard that he carved the whole thing into a gold plate in priestly script and buried it near Palmyra, New York.

(Laughter) I leaned forward.

(Laughter) “What happened to the Lamanites?”

“They Became Native Americans in America”

“Do you believe that the descendants of evil people are Native Americans?” “Yes.”

And a man named Joseph Smith dug gold plates and magic stones out of his backyard, put them in his hat, buried his face, and was able to translate from priestly script into English.

At this point, I wanted to coach the boys on how to market them. (Laughter)

"Don't cut it out of the story"

Even Scientology starts with a personality test before we talk about Xenu and the evil kings of the universe. (Applause)

They asked, "Do you believe in dialogue with God through righteous prophets?" "No."

I wasn't convinced by the story of the Lamanites and the gold plates.

what do you mean? Can I become a woman? ”

I asked them why they said "no"

“God has given women such a gift that the only gift left to men is prophecy.”

What is the gift she received?

Women's cooperativeness and adaptability?

To live longer than men and not be more violent than men?

But it wasn't like that

You say, "It's about having a baby"

“Assuming that childbirth does not cause death from overwork,

Even if a woman were to give birth to children every year from the age of 15 to 45, there would still be time left to hear the words of God.” “No.”

(Laughter) They don't look innocent anymore, but they keep going

"If you're a devout Mormon, when you die, you can go to heaven and be with your family forever."

“Oh my!

(Laughter) It's not even encouraging to me.”

(Laughter) And they said, “Heaven will have a perfect body.

I believe we can get it back, like someone who lost a leg.

I'll get my feet back

The blind regain their sight.”

So I said, "I had my uterus removed a few years ago because of cancer. Can I have my uterus back?"

"of course"

"I don't need it, it's fine without it"

What if you're happy with your nose shape?

(Laughter) I wonder if God is telling you to put your original nose back.

And then they handed me the Book of Mormon, and they told me to read it because they'd come back later, and I said, 'That's fine,' and I think they left.

At first I thought I was right for myself who was immersed in mediocre beliefs

I started rethinking my beliefs

If someone comes to visit and is told Catholic theology and doctrine for the first time, "God impregnates a young girl without sexual intercourse—the fact that she is a virgin is important."

(Laughter) She gave birth to God's child." I think it's ridiculous.

I didn't think anything of it because it was common knowledge.

(Laughter) So they couldn't make a big face.

But the first question that stuck with me was the question, do you believe that God truly loves you?

Because I was vague about what I meant, if God made you

If you ask me if I feel you really love me

My answer was quite different, and I think I immediately answered something like, "Yes, I feel God's love when I'm hurt or lost.

I feel healing and comfort Why do disasters happen?

When I don't understand, I ask God's love for help, and I feel God's love when I see beauty with gratitude."

But the use of the word "believe" in the question changed the answer a lot, because feeling and believing felt like two different things.

About a year ago, I asked myself, "Why am I not a vegetarian, knowing all this?"

I'm a green person. I was raised in a log cabin by hippie parents.

Launched environmental conservation site treehugger.com I am interested in environmental issues

We also knew that eating just one hamburger a day increased the risk of death by 30 percent.

When it comes to animal cruelty, I also knew that 10 billion animals are raised for meat each year in factories. We are hypocrites.

Amazingly, from an environmental point of view, meat production produces more greenhouse gases than any form of transportation -- cars, trains, planes, buses, ships.

Beef production requires 100 times more water than vegetable production.

this is not my problem

Societies as a whole are consuming more than twice as much meat as they did in the 1950s.

Meat, which was once a special delicacy, has taken center stage and is on the table every day.

So every score is enough reason to be a vegetarian.

But I knew it was wrong, but I stuck to my usual thick steak.

Why couldn't I do it?

Now I know why.

There was only the choice of being a carnivore or a vegetarian, and I wasn't prepared to choose between them.

If you think about the last hamburger you ate, you'll understand.

(Laughter) So my decency, my good intentions, were competing with my preferences.

And I dismissed it as "next time", but that "next time" never came.

You all know, right?

So I thought there might be a third solution.

As a result, we devised this method

I tried it last year and it works really well

We named it "Weekday Veg" (vegetarianism five days a week)

Just by hearing the name, you'll know

You can eat whatever you want on weekends

it's simple

If you want to take it to the next level, remember that red and processed meats are bad for the environment and your health.

Instead, we eat delicious fish caught using eco-friendly fishing methods.

It works according to the calendar, so it's very easy to follow.It's okay to break the rules once in a while.

After all, going meat-free for five days a week means reducing your meat intake by 70 percent.

"Weekday Veggie" is great

My environmental impact is lower, I'm less polluted, I feel less guilty about animals, and I'm saving money.

Best of all, I'm healthier, I'm likely to live longer, and I've lost weight.

So everyone, it's good for your health, good for your wallet, good for the environment, good for your animals.

If all of us here halved the amount of meat we eat, that's exactly the same as half of us here being vegetarians.

thank you

(applause)

What would the world look like as we see it?

Natural disasters, war and terrorism

Refugees and terrifying epidemics

You see it, right?

You'll find beautiful beaches, cute animals, amazing nature, and cultural rituals.

You put these things together in your mind to create an image of the world.

Can you do that?

The world seems terribly strange, doesn't it?

but i don't think so

I don't think the world is that strange

I got the idea there

Imagine the world as a street, with the poorest people at one end and the richest people at the other end, and everyone in the world living along this street.

Both you and me. We live next door to people who have the same income.

In the same area— people from different countries, cultures, and religions.

the street is like this

i became interested

I live in Sweden and meet many students

I wanted to know where they thought they were on this street.

So we replaced this house with people.

7 billion people living in the world

If you live in Sweden, you're probably in here, the richest.

But when I ask my students, they tell me they're somewhere in the middle.

How can we ever make sense of the world if we're constantly seeing terrifying images all over the world and we think we're somewhere in between when we're actually near the top?

it won't be easy

So I sent photographers to 264 homes in 50 countries -- and counting -- and they took pictures of the same thing in each home.

We photograph beds, countertops, toys, and 135 other objects.

So far, we've collected about 40,000 photos, for example, this photo.

As you can see, at the very top it says "Families in the World by Income," and just below that is that "street."

And then there are a couple of visiting families.

Poor families on the left, wealthy families on the right, and the middle class in between.

Scroll down to see families you've visited so far.

For example, from left to right, this is a family from Zimbabwe, India, Russia, and Mexico.

You can see different families like this.

Of course, you can also select a country or region to compare, and you can also filter photos by object.

Let's go to the front door and see how it goes

Here are the gateways to the world, sorted by income.

You can see the big difference.These examples are from India, Philippines, China, and Ukraine.

let's go home

you can see the bed

the bed looks like this

It's very different from interior magazines.

It's not like the scary images you see in the media.

As I said earlier, Swedish students thought they were among the wealthiest in the world.

let's look in the middle

I'm going to zoom in on the middle part of the "street," like this, and then I'll ask the students, "What does your bedroom look like?"

And then the students feel a little different.

So we select the poorer segment and ask them how they are doing.

Students say it's not a typical Swedish bedroom.

So if you select the richest class, suddenly something familiar to the students appears.

These bedroom pictures are from China, Holland, South Korea, France, America, etc.

click on one of the beds

You can learn more about the home that the bed is in, and you can click the "Visit the Home" button to see all the photos of the home.

You can list like this

Anyone can use this site Dollar Street for free.

Please visit here to add your photo

My favorite is -- you can't tell me not to show it, but I'll show you. It's the bathroom.

(Laughter) So many toilets.

All of them look familiar, don't they?

These are from China, the Netherlands, the United States, Nepal, etc. There is also Ukraine and France.

they all look alike

But that's because it's the wealthy class

So what happens when you look at all the layers of toilets?

Things have changed a bit, haven't they?

In this way, photos can be viewed as data by category.

But sometimes pictures just don't tell

Sometimes it's easier to see the action, so I also record videos of everyday actions, like washing your hands, doing laundry, brushing your teeth, and so on.

I'm going to show you a video of me brushing my teeth, starting with the wealthy.

As you can see, everyone is brushing their teeth

It's really interesting that the same kind of plastic toothbrush is used in all these places.

With varying degrees of seriousness -- (Laughter) there's a toothbrush.

As you move down into the poorer strata, there are people who use sticks, and there are people who use their fingers to brush their teeth.

When this woman in Malawi brushes her teeth, she scrapes some dirt off the walls of her house, mixes it with water, and uses it to brush her teeth.

So in the Dollar Street material, in tagging this picture you see here, I'm not just tagging it as "wall," but also as "toothpaste," because that's part of what it's used for.

So what we can say from this is that the poorer people will use sticks and their fingers, the middle class will use toothbrushes, and the wealthier people will use one per person.

You can have the luxury of not using the same toothbrush as grandma.

You can also view by country

This is the distribution of income in the United States, and most people are in the middle class.

I visited the wealthy Howards.

this is the house

I also visited the poorer family on the left.

And what it does is give you a direct comparison of what's in each household.

Let's take a look at the drawer of spoons and forks

Look at the drawers in the Hadley family, where they put it all together in a green plastic box.

Several types are put in the same box, some of which are plastic, while the Howards use wooden drawers with wooden crate dividers to sort them by type.

You can add more family members, compare kitchen sinks, see living rooms.

Similar comparisons can be made in other countries

Now let's move to China and choose three families.

You can see the house, you can see the sofa, you can see the countertop.

Looking at this kitchen table, it's clear to me that when we imagine other countries, we tend to think that they have a common way of doing things, but that's absurd.

look at these countertops

It's very different, isn't it? How you cook depends on your income.

What's interesting is the cross-country comparison.

this is china and america

You can see that there is a large overlap.

I'm going to pick the same income families that have already emerged from these two countries: the Wu family and the Howard family.

If you compare the bedrooms, it's hard to tell which is China and which is America.

They all have brown leather sofas and similar play areas.

They're all made in China, so it's not that weird of a match, but -- (Laughter) they're very similar.

You can also look at the other end of the street. Let's add Nigeria.

Let's compare Chinese and Nigerian households.

Looking at the family photos, it doesn't seem like they have much in common.

But look at the ceiling

It uses vinyl covering and grass.

We use the same "sofa", we store the grain the same way, we eat fish for dinner the same way, we boil the water the same way.

If you visit these families, there's a big risk that you'll think you know the way of life in China or Nigeria.

You can see that in the picture on Dollar Street.

So let's get back to the statistics. There are seven billion people in the world.

Comparison is made at the poorest level Bed [Burkina Faso/India] Roof [New Guinea/Burundi] Cooking table [India/Malawi]

Notice that in every comparison, the homes were chosen from completely different regions.

but the pictures are similar

The poorest billion people cook the same way they do in these places. They may not have shoes [Haiti/Burkina Faso]. If they don't have a spoon, they eat with their hands.

There are five billion people in between. These people probably use light bulbs [Bolivia/Indonesia], they don't sleep on the ground [Bolivia/Indonesia], they use containers to store salt [Liberia/Nigeria/Philippines/Vietnam], they own more than one spoon [Zimbabwe/Philippines] and they own more than one pen [Nepal/Haiti], and their ceilings don't leak much [India/Liberia] and they wear shoes [Tunisia/Indonesia]. Colombia] Mobile phones and [Cambodia/Rwanda] Own toys [South Africa/India] Dispose of garbage [South Africa/Nepal]

When it comes to the richest people in America and Jordan, they wear the same kind of shoes.

I have a sofa, fruit, a hairbrush, and a bookshelf.

Wardrobe of Vietnam and Kenya Lighting, black dog, floor, soap Laundry room, clock, computer, mobile phone, etc.

With so much in common around the world, the images we see in the media portray the world as a very strange place.

But if you look at the picture of Dollar Street, it's very different.

With Dollar Street, you can use your photos as data, and the stereotypes about other countries will quickly fall apart.

The people watching you from the other side of the world are actually very similar to you.

This gives us reason to act and reason to hope.

thank you

(applause)

Today we will talk about penguins

The first thing I would like to say is that we need a new operating system for our oceans and our planet.

When I came to the Galapagos more than 40 years ago, there were about 3,000 people living here.

Now over 30,000 people

At that time, Santa Cruz only had two jeeps.

Now it's crowded with thousands of trucks, buses and cars.

So the fundamental problem is mass consumption and population growth.

It's the same with the Galapagos, but of course it's worse here than anywhere else.

The reason is that the population of the Galapagos has more than doubled since 1960, but the world's population is said to be 6.7 billion, and nobody hates consumption.

One of the main problems is that our operating system doesn't give us feedback correctly.

We're not paying the environment enough for what we do.

I moved to Fernandina when I was 22, and had never been camping before.

I never lived alone, never spent the night with a snoring sea lion.

Furthermore, it was my first time living on an uninhabited island.

We spent a year in Punta Espinosa, and we called it a deserted island, because there were no other people there.

But the flora and fauna were so abundant that it could hardly be called deserted.

A lot has happened in the last 40 years, and what I've learned from coming to the Galapagos is the importance of unexplored nature and wildlife, and the wonderful characteristics of penguins.

Penguins are true athletes, swim 173km in one day

No slowing down, no Olympian

This means that you can keep swimming at a pace of 7 kilometers an hour.

But what's really amazing is the depth they swim in. Emperor penguins can dive over 500 meters and can hold their breath for an additional 23 minutes.

The Magellanic penguins I'm studying can dive to a depth of about 90 meters, and can stay there for about five minutes.

At a depth of 90 m without a human foot

I don't think anyone among you can do four minutes of diving.

Impossible without training

penguins are great athletes

Also, I've never met anyone who doesn't like penguins.

joking, walking upright, diligence

Don't forget to look beautiful

In other words, it has all the conditions to attract people.

But what makes it scientifically superior is its quality as a sentry.

They tell us about the Earth, especially the oceans, from a different perspective.

Here's a picture of a Galapagos penguin standing perched on the tip of an inflatable boat.

they were my research objectives

I was going to study the social behavior of these penguins, but as you know, they're a very rare species.

A rare penguin in the world

I don't know why I thought I could do this kind of research.

From the first time I visited here, the population had undergone a drastic change.

When we first censused penguins, we just counted as many penguin beaks as we could find.

When I counted about 2000, I lost track of how many there actually were.

If we do this now, the national parks will count 500.

So a quarter of penguins are what we counted 40 years ago.

As is common in ecosystems on Earth,

Plant and animal populations are declining, and most continue to decline dramatically.

I would like to explain why

(Cries) This is a penguin cry, screaming that we need to pay attention to penguins.

Most importantly, when I first heard it, I didn't know it was a penguin.

If you can imagine sleeping in Fernandía for the first time, you'll understand.

I fell in love with penguins and they changed my life.

And what I've learned is that it's how the Galapagos changed that matters.

You know El Niño, but it's a big deal for penguins.

This is a phenomenon called La Niña, where the water temperature drops.

The blue and green areas are points where the water temperature is very low.

And if you look at this, you can see that the Peruvian current is moving toward the Galapagos, and this undersea current, called the equatorial submarine, rises to the surface around the Galapagos.

When these currents flow in and cool the waters around the Galapagos, they become more nutritious.

During a severe El Niño, the whole Galapagos area turns red and there is no green.

There's no updraft, so there's no food left.

Like a desert Not only penguins, but also sea lions and iguanas

You may starve to death

But while studying penguins, we didn't know that Galapagos was affected in this way.

Even if you go to the Galapagos to see penguins, it's possible that there won't be any penguins during El Niño.

penguins don't give birth

I also did research on marine iguanas in the same place.

we knew this was the world's problem

This is the Argentinian coastline where I'm working right now, and there's a place called Punta Tombo, which is the largest habitat of the Magellanic penguins in the world.

In some years, the cold waters reach Brazil, but not in La Niña years.

The oceans don't always behave the same way, but penguins have to navigate this change, and it's not going to be easy.

Everything was fine when I visited to study penguins.

there were a lot of penguins

This is a photo of Punta Tombo in February Penguins can be seen all over the beach

Japanese people asked me to catch penguins for expensive golf gloves, proteins and oils.

Luckily no one has caught penguins.More than 100,000 tourists come to see penguins every year.

But the penguin population is declining, and the rate of decline is substantial, and when we first surveyed the active nests from 1987, they were down about 21 percent.

Punta Dragonfly is here Penguins breed in close quarters

Years of research have revealed

And science is very helpful in making decisions, and it guides us in how we're changing and in what direction we're going.

Over the last 27 years, we've been able to create maps like this by creating the Penguin Conservation Project with many sponsors and the Wildlife Conservation Society.

And it's not just the Galapagos penguins that face problems, but Magellans and other penguins as well.

So we're starting a global conservation effort to alleviate the penguin's plight.

One of the troubles for penguins is oil pollution.

Penguins don't like oil, and they don't like swimming in it.

Luckily, if you look around Argentina, there's no oil pollution on the surface.

But actually, when I go to Argentina, I see penguins covered in oil all the time.

they couldn't help it

It must have swam in oily ballast water.

When transporting oil in a tanker, it is necessary to release water that has accumulated somewhere.When there is no oil, blast water is put in.

When we get back to port, we dump this oily blast water into the ocean.

Why are you doing this? This is because we can cut costs by omitting consideration for the environment.

This cost is mostly unnecessary, but we're trying to create the right system of accounts to pay the green price.

The Argentinian government initially responded that

"There's no such thing as an oily penguin

There are laws here that prohibit illegal dumping."

It took me nine years to convince them that there were oily penguins.

One year, like this year, over 80 percent of the adult penguins were found dead on the beach in oil.

The blue dots represent the number of chicks. We do this survey every March. The chicks are only outside from January to March.

One year more than 60% of the chicks were covered in oil.

The government finally listened and, to my surprise, changed the law.

When the government rerouted cargo lines 40 kilometers away from land, the illegal water cannons went down.

As a result, the number of penguins covered in oil has plummeted.

Why doesn't it go away completely?

We've solved the problem in the province of Chubut, where Punta Tombo is located, which is about 1,000 kilometers along the coast, in northern Argentina, Uruguay and Brazil.

Now moving on to the impact on penguins

I'll tell you two stories

First, climate change. This is an interesting study. We put satellite tags on the backs of Magellan penguins.

I gave thousands of dollars to convince donors to attach communication tags.

I have been doing this survey for more than 10 years to know the range of penguins.

We figured we needed a marine protected area with a range of about 30 kilometers, so we tipped the penguins.

The study recorded this point as the point where the penguins that hatched in 2003 traveled, and as you can see, some penguins migrate as far as 800 kilometers from their nests.

So while one parent warms the eggs in the nest, the other looks for food, and the longer the nest is open, the worse it gets.

This, of course, becomes a vicious cycle, with fewer chicks to raise.

As you can see, in 2003, each nest had just over half a chick.

Now, in 2006, the number of chicks per nest had risen to about 0.75, and you can see them scattered around Punta Tombo, which means they haven't gone very far.

In 2009, the number of chicks plummeted to about 0.25, and some penguins have been seen more than 900 kilometers from their nests.

It's like working in Chicago and then being transferred to St. Louis.

The same applies to penguins

Compared to 10 years ago, the range has increased by an average of more than 40 kilometers.

This information should be made public.

So we started co-publishing with the Society for Conservation, which publishes the latest scientific information in the form of novels.

If you're interested in cutting-edge science and smart conservation, work with our 11 partners, some of whom are here, such as the Nature Conservancy.

And finally, I'm sure that all of you have probably noticed, in your interactions with animals like dogs and cats, that animals also have personalities.

Some may consider themselves part of the family

If you get to touch a penguin, I think you'll feel the same.

Penguins are amazing creatures that will change the way you see the world. Penguins and humans are no different. They are desperately trying to survive.

This photo is a penguin turbo

Turbo has never been baited

This guy was standing under my diesel turbo truck when he met us, so I named him Turbo.

Turbo will often knock on the door with its beak, and it will open the door and let you in.

There's something I wanted to show you, and it's a video of when Turbo brought a friend over one day.

this is turbo

He's approaching my graduate student and flapping his wings, which is what penguins normally do to females.

I'm not trying to bite you

Your friend is here for the first time, so she's trying to figure out what's going on.

"What are you doing here?

You're a weird guy."

This student will soon...

Look, I'm flapping my wings with all my might

My friend looked at the student and said, "He's really weird."

I tried to bite you

Penguins, like pet dogs and cats, each have their own personality.

We are also working on enhancing information gathering and computer literacy.

I have a computer in my nest and I write information on it.

And penguins, for better or worse, help us with our research.

It employs an RFID system

Penguins can be located by attaching a bar-coded rice-grain-sized device to the penguin

If you pass the side of the pad, individual identification will be done

A few penguins are coming

This penguin is returning to its nest

Everyone will be home at this time. This guy is walking slowly, isn't he?

A hurried female penguin came

The reason for the rush is the heat and the chicks waiting for food.

Another one came home slowly

This guy is fat, isn't he? He came back to feed the chicks too.

And I found a penguin playing in a box

This box is mine and the system is still up and running.

The penguins are looking at the wire, but they don't seem to like it.

I unplugged the wire. Data disappeared.

(Laughter) Penguins are truly amazing creatures.

Now the most important thing

The only person who can change you is you. You can make the world a better place for people and penguins.

thank you

I'd like to talk to you about energy for a while, and I'm going to talk about a lot of different things.

I don't want to get too far off topic, but I think it's good to talk about oil first.

I'm going to talk about energy in general, but I want to start with oil.

First of all, oil is an amazing substance.

If you can combine exactly eight or so carbon atoms with twenty or so hydrogen atoms, you get this wonderful liquid, which is highly energy dense, easy to purify, and has many useful products and fuels.

it is a good material

We have enough oil in the world for now.

I have a pocket-sized map showing where the oil is.

Please see the large map

Shows where oil is located around the world

Geologists know pretty well where oil deposits are

There are still about 100 trillion gallons of oil in the world that can be extracted or refined.

And that's about it for oil, and you could end the story by saying, "The oil age will never end, because there's enough of it out there."

But the story doesn't end here

This is going off topic, but for those of you who think oil is far away, 1,000 meters below where you are sitting is one of the world's greatest oil fields.

I can tell you more if you listen to me later.

I have a lot more to say about oil.

So what is oil? Where is your position in the energy system?

A brief history of oil in the last 150 years. For the last 150 years, oil has dominated the energy system.

Let me tell you one more little secret: Over the past 25 years, oil's role in the world's energy system has been declining.

Its peak was in 1985, when it accounted for half of the world's energy supply.

Currently only 35%

The percentage of oil that has been declining, and I think that trend will continue.

Gasoline consumption in the United States peaked in 2007 and has been declining since.

Every year the importance of oil continues to decline.

And just as oil peaked 25 years ago, coal peaked in the 1920s, and 100 years before that, wood peaked.

This is an important graph about the evolution of the energy system

What has filled the oil hole for the past few decades?

It's natural gas, nuclear energy is now being used.

So what does the future hold?

I suspect that gas will peak in the next few decades, and then renewables will peak after that.

Let's talk about the important things about this diagram.

I am by no means saying that total energy use will not increase. That's another story. I think we can explore this in more detail at another time. But there's an important message here.

The world's energy system is emitting less carbon than it did a year ago, a decade ago, a century ago.

As renewable energy, which we are developing today, will account for 30 percent of our primary energy sources by mid-century, carbon emissions will continue to decline.

I'll leave this story for now. Of course, we could replace everything with non-nuclear renewable energy, but in practice there are many considerations.

I'd like to move on to the next topic, but let's think far ahead, say, 2100 and beyond.

What about truly sustainable, carbon-free energy?

Let's take a short trip, first to central Texas.

this is limestone

Taken outside Marble Falls, Texas

about 400 million years ago

It's just plain limestone, nothing special.

there is chalk

I picked it up at M.I.T, but it's a little newer.

You can see that it's different than limestone.

You can't build a building with chalk You can't write a class on a chalkboard with limestone

this is the difference but it's the same

They're the same substance, they're both calcium carbonate.

The difference lies in how the molecules are bound

If you like this kind of story, this is where things get interesting.

This is an abalone shell I picked up off the coast of California.

Millions of abalone make shells like this every year.

As you may have already noticed, it's made of calcium carbonate.

This is the same substance and this is the same substance

But it's not the same. There's a difference.

Thousands, maybe three thousand times stronger

Why? Because these little abalones are able to stack layer after layer of calcium carbonate crystals, they can create beautiful, shiny pearls.

It's a very special material that abalone can produce. Millions of abalones continue to make this material every day of the year.

it's incredibly beautiful

The difference is

It's in the way the molecules are connected

How does this relate to talking about energy?

there is coal

Let me tell you that this coal is just as interesting as this chalk.

Whether it's a fuel, an energy carrier, a new material for batteries or fuel cells, nature didn't create these perfect materials because it didn't need to.

Because unlike abalone, nature didn't depend on the survival of the species to create this material, and that's probably been the case until now, when this became a problem.

So when you think about the future of energy, imagine what the future will look like. Instead of this, we can just modify the way molecules are arranged to create energetically equivalent substances.

this is what i wanted to talk to you about

never run out of oil

not because they are abundant

It's not because we're going to build a lot of windmills.

Thousands of years ago, people were able to come up with new things, to have ideas, to have innovations, to have technology, and the Stone Age ended, not because we ran out of stone.

(Laughter) Ideas, innovations, technologies will end the oil age before it runs out.

thank you

(applause)

Today, we're announcing the first artificial cell. The cell was born as a computer's digital code, and the chromosome was made from four vials of chemicals, and the chromosome was assembled in yeast, transplanted into a recipient bacterial cell, and the cell was transformed into another species of bacteria.

So this is the first self-replicating species on the planet that has a computer parent.

It's also the first species to publish its encoded genetic information on a website.

I will talk about adding a watermark later.

The origins of this project go back 15 years, when our team, then called TIGR, was working for the first time in history to sequence two genomes.

Haemophilus influenzae and Mycoplasma genitalium, the smallest self-replicating organism.

After I finished sequencing these bases, I thought, "If this is the smallest genome for a self-replicating species, could there be smaller genomes?"

And at the genetic level, can we understand the basics of how cells work?

After 15 years of research, we're finally at the start of an answer to this question, because it's very difficult to remove multiple genes from a cell.

You have to remove them one at a time.

So, early on, we decided to do something artificial, something no one else had tried before, but to see if we could synthesize bacterial chromosomes, and to figure out which genes were essential, we experimented with different gene contexts.

That was the beginning of 15 years of research.

Before we started our first experiment, we asked Art Kaplan's team, then at the University of Pennsylvania, to look at what the risks, challenges, and ethical issues might be for making new species in the lab, because it was the first time we'd done it.

Art Kaplan spent two years doing an independent study and published the results in 1999 in Science.

Hamm and I left this research for two years to work on another project to analyze the human genome, but as soon as the analysis was completed, we immediately returned to this work.

In 2002, we set up a new research institute, the Institute for Alternative Bioenergy. We had two goals. First, to understand the impact of our technology on the environment, to find ways to better understand the environment.

We published our first results in 2003.

Ham Smith and Clyde Hutchison invented a new method for making error-free DNA on a small scale.

My first job was on a 5,000-character code for a bacteriophage, a virus that only attacks E. coli.

We used the bacteriophage φX174, but there are historical reasons for that choice.

It was virtually the first DNA phage and DNA virus DNA genome to be decoded.

I figured that if it was possible to create virus-sized pieces of 5,000 base pairs, then this would be a way to create, at the very least, a large number of contiguous pieces, and then piece them together to create this mega-base-pair chromosome.

This was a much larger size than originally expected.

There were several steps to this, and there were two challenges. To make a large-sized DNA molecule, we had to solve a chemical problem, but we also had to solve a biological problem: if we could create this new chemical, how would we activate it and activate it in the recipient's cell?

So we had two teams working in parallel, one chemistry team, and another team working on transplanting whole chromosomes into new cells.

When I first started, I thought synthesis would be the biggest challenge, so I chose the smallest genome.

As you can see, we changed from the smallest genome to a much larger genome.

I can give you a few reasons why, but basically it's because small cells take a month or two to get results, whereas large cells divide very quickly and you can get results in a couple of days.

If one cycle takes six weeks, the number of experiments that can be done in one year is small.

What's more, 99 percent, probably more than 99 percent, of the experiments we do are failures.

This is what we call debugging, because it was a problem-solving scenario from the beginning, because we didn't see a path to success.

The most important publication was in 2007.

Carol-Lartig's team successfully transferred chromosomes from one bacterium to another.

In retrospect, I think this was the most important work we published, because it showed how dynamic life can be.

And I thought, if this worked out, I really had a chance.

I didn't know if it would be possible in a few years or if it would take more years.

In 2008, we announced that we had fully synthesized the genetic code of the Mycoplasma genitalium genome, which is over 500,000 characters long, but we hadn't succeeded in activating the chromosomes.

I thought it was because, first, it's slow to grow, and second, it's because cells have a variety of defense systems to prevent things like this from happening.

It turned out that the cells we were going to transplant had DNA-degrading enzymes called nucleases on their surface, and they liked to digest the synthetic DNA that we gave them, which was a hindrance to transplantation.

But at the time, it was the largest defined molecule ever created.

We've made progress on both fronts, but some of the syntheses had to use yeast, put this substance in the yeast, and they were supposed to do the synthesis for us, and that had to be done.

It was an amazing step forward, but it also came with a problem, because we were growing bacterial chromosomes in yeast.

In order to perform the transplantation, we had to find a way to extract the bacterial chromosome from the eukaryotic yeast in a form that could be transplanted into the recipient.

So our team developed a new technique to grow and clone complete bacterial chromosomes in yeast.

So I tried to replicate the same mycoides genome that Carroll had first successfully transplanted into yeast as an artificial chromosome.

I thought it would be an excellent test bed for learning how to take chromosomes out of yeast and transplant them.

And we did an experiment, and although we could take the chromosome out of the yeast, we couldn't transplant it and activate it in a cell.

I've spent two years solving this little problem.

It turns out that the DNA present in bacterial cells is methylated.Methylation prevents the DNA from being digested by restriction enzymes.

So it turns out that if you can take the chromosome out of the yeast and methylate it, you can transplant it.

The study was further advanced by the successful removal of the restriction enzyme gene from the recipient mycoplasma cells.

Once this was successful, it was possible to transplant naked DNA from yeast.

When we published our results last fall in Science, we were overconfident and thought that it would be feasible to take the chromosomes out of yeast and start them up in cells in just a few weeks.

The biological technology needed for the transplant had been worked out, and a year and a half ago we had problems with Mycoplasma genitalium and its slow growth, so we decided to synthesize a larger Mycoides chromosome.

Dunn's team set out to synthesize this chromosome with over a million base pairs.

But it later turned out to be not so simple, and we had to go back three months, when we found out that in the sequence we synthesized, one out of a million base pairs was wrong.

So Dunn's team developed new debugging software that can test whether synthetic fragments can multiply in the presence of wild-type DNA.

Of the 11 sets of 100,000 base pairs that we synthesized, 10 were found to be perfectly accurate, life-forming sequences.

When we focused on the remaining fragment and sequenced it, we found that it was missing just one base pair of an essential gene.

As such, accuracy is essential.

There are parts of the genome where even a single error is unacceptable, and there are parts where any error is tolerated, just like we incorporated long sequences of DNA as watermarks.

It took me three months to find the error and fix it.

And one morning at six o'clock from Dan

I got a message that the first blue colony had been found.

It's been a long road. I spent 15 years.

I thought that one of the basic principles to follow in this field of research was to be able to clearly distinguish between synthetic DNA and natural DNA.

When you're starting a new field of science, early on you need to consider all the pitfalls, or be careful about things that make you think you've achieved what you haven't, or at worst end up making other people believe it.

I thought the biggest problem was that the contamination of a single molecule of a naturally occurring chromosome would lead us to mistakenly believe that we could synthesize a cell when it was just a contamination.

So early on, we marked the DNA so that it was absolutely clear that the DNA was synthetic.

When we made our first chromosome in 2008, we put the name of the maker of the chromosome into the 500,000-base-pair chromosome as the genetic code, but it used the one-letter code for the amino acid sequence, leaving out certain letters of the alphabet.

And that's how we embedded code within code, within code within code.

New code for interpreting DNA and writing messages.

For a long time, the job of writing messages into the genetic code has been done by mathematicians. Mathematicians are not biologists. The long messages that mathematicians create are likely to lead to the synthesis of new proteins with unknown functions.

So the code that Mike Montagu and his team developed often added an end codon, a different system of the alphabet, which allowed them to use all letters, punctuation marks and numbers.

There are four major landmarks in the genetic code of over 1,000 base pairs.

The first contains the code to decipher the rest of the genetic code.

The rest of the information in the index is, I believe, the names of the 46 authors and the major contributors to the success of this project.

It's not just the name, but the website address, so if someone cracks the code within the code within the code, they can send an email to this address.

So it's clearly distinguishable from other species, because it has 46 names and web addresses.

I've also included three quotes, because in my first Genome, I was criticized for not saying anything profound and just signing my work.

I'm not going to tell you about the rest of the code, but instead I'll give you three quotes.

The first is “To live, to err, to fall, to triumph, and to recreate life out of life.”

In the words of James Joyce

The second is “See things, not as they are, but as they might be.”

This is a quote from Robert Oppenheimer's book "American Prometheus".

Lastly, in the words of Richard Feyman, “What I cannot build, I cannot understand.”

From the point of view that it is also a philosophical progress, I tried to address the philosophical side in addition to the technical side.

Before I get into the question, I'd like to add that we've done a tremendous amount of research, and we've asked for ethical considerations in this, and we've tried to push the boundaries on that as well as the technical side.

This announcement, like the one in 2003, was funded by the Department of Energy, so the decision to keep it confidential or to make it public was discussed at the White House level.

And it paid off in the right way, public disclosure. It kept the White House informed, it kept Congressmen informed, and it continued to advance scientifically, but it also tried to solve political problems.

Now, I'd like to take your questions here.

then the one behind

REPORTER: Can you explain in layman's terms how revolutionary this announcement is?

Venter: It's a question of importance.

I don't know if I'm in a position to explain the significance.

it's important to us

It's going to make a huge philosophical shift in how we think about life.

I started working 15 years ago to try to understand life at a fundamental level, and I think the current stage that we've reached in 15 years is just the beginning.

But I am convinced that this result will be a very useful tool in the future, and we have already started several studies using this tool.

In our lab, we're currently doing a project with Novartis, funded by the National Institutes of Health, using these synthetic DNA tools, and hopefully next year we'll be able to deliver a flu vaccine.

What previously took weeks or months, Dunn's team can now complete within 24 hours.

Considering how long it took to get an H1N1 vaccine, we can think of a much shorter time frame.

In the field of vaccines, we're in the process of starting a company with Synthetic Genomics, because we believe that this tool will allow us to develop vaccines for diseases that were previously thought to be untreatable, such as the rapidly evolving rhinovirus.

It would be great if we could find a way to prevent the common cold.

HIV would be even better, because in this disease the virus evolves so rapidly that current methods of vaccines cannot keep up with the evolution of the virus.

Synthetic-Genomics also addresses important environmental issues.

The oil spill in the Gulf of Mexico is a warning to us.

CO2 is invisible, it takes scientific methods to measure it, and we're seeing too much CO2 being emitted, but right now, crude oil, the precursor to CO2, is polluting our oceans and Gulf coasts.

We need an alternative to petroleum

Together with Exxon-Mobil, we're developing a new type of algae that can effectively absorb carbon dioxide from the atmosphere and from concentrated substances and create new hydrocarbons, which we then turn into oil refineries, where CO2 is turned into ordinary gasoline and diesel fuel.

These are just a few of the research approaches we're currently taking.

(applause)

Four years ago, I was here, and the talk wasn't online yet.

It was handed out to the participants as a boxed set of DVDs, which I'm sure must have been kept safe, never taken out.

(Laughter) A week after the talk, Chris called me and said, "We're going to stream the talk online.

Do you mind if I send yours too? ""of course"

Over the next four years, that talk was downloaded four million times.

In terms of the number of people who saw it, it's probably about 20 times that number.

And Chris says they're all starving.

(Laughter) (Applause) Don't you feel that too?

(Laughter) So I've been preparing very carefully throughout this event, so let's get started.

(Laughter) Al Gore spoke about the environmental crisis at TED, the same time I gave a talk four years ago.

I touched on the content of that talk at the end of my talk.

Today I would like to continue from where I left off, because we only have 18 minutes.

So as I said earlier. . . (Laughter) He's right.

Clearly, there is a grave crisis of climate change, and if you don't believe it, you better get out there.

(Laughter) But there's another environmental crisis that's just as serious, the same kind of crisis, and just as urgent to deal with.

that is. . . But you'll say, "Enough, one crisis, many.

I don't need a second

This is not a question of the natural environment, but of course the natural environment is important, but it is a question of the human environment.

As many of the other speakers at the convention have pointed out, we're basically not using our talents well.

The majority of people don't know what their talents are in life, and they don't even think they're talented in the first place.

It's not uncommon to meet people who think they have nothing to offer.

I have come to see the world in two groups

Utilitarian philosopher Jeremy Bentham articulated this idea beautifully.

"There are two kinds of people in the world, those who divide the world in two, and those who do not."

(Laughter) I'm a divisive person.

(Laughter) A lot of people don't enjoy their jobs.

These people just endure their lives silently.

I find no joy in my work

Rather than enjoy it, wait for the weekend to come.

On the other hand, some people love their jobs and can't imagine doing anything else.

If you tell them to stop, they'll look like they don't understand, because to them it's about their existence.

"But this is what I am

It's silly to stop doing this, because my truest self is here."

But not many people live like this.

In fact, people who live this way are in the minority.

I think there are various reasons for that.

One of the big reasons is education, because education in some ways separates many people from their natural talents.

Human talent, like natural resources, is buried deep inside.

If you don't look for it, you won't find it.It's not lying on the surface.

We need to create conditions for talent to emerge.

You might think that education is the way to do that, but in many cases it's not.

Education systems around the world are improving, but it's not enough.

Improvement doesn't help, because it only improves a broken model.

What we need, as we've often heard here, is not an "evolution" of education, but a "revolution" of education.

education has to be something else entirely

(Applause) The real challenge is education.

It's about fundamentally reinventing itself. Reinvention is hard because you have to do things that people don't think are easy, and that's what we take for granted.

You're going to challenge what you think is obvious.

The big problem with improvement and change is the tremendously powerful force of "common sense."

Common sense is when everyone assumes, "We've been doing it this way all along, so there's no other way."

I recently heard some great words from President Lincoln, and I'm sure you're all happy to see Lincoln here.

(Laughter) President Lincoln's address to the Second Congress in December 1862.

I have no idea what happened in the United States at the time.

Because we don't teach American history in England.

(Laughter) We're "repressing" American history as a policy.

(Laughter) I think something big happened, and if you're from the United States, you probably know that.

Lincoln said, "The doctrines of the calm past are no match for the stormy present.

This age is full of difficulties, we must rise with this age.”

That's great. Not "against the times", but "with the times".

“New situations require new thinking and new behavior.

We must untie ourselves and save this country."

That's a good word. "Unchained."

You know what I mean?

There's an idea that we're all trapped in, and we take it for granted that it's natural.

Many of our thoughts were shaped to the conditions of the last century, not to the conditions of the present.

But our minds are still captive, so we need to free ourselves from bondage.

Easy to say, hard to do

It's very difficult to know what you take for granted

because we take it for granted

Let's hear what you take for granted

How many are over the age of 25?

I don't think you take it for granted

What about those under 25?

If you're over 25 and you're wearing a watch, please raise your hand.

most people do

Ask a teenager the same question

teenagers don't wear watches

It's not that I can't or I'm not allowed to, it's that I don't want to do it myself.

The reason is that people over the age of 25 grew up in a pre-digital age.

If you wanted to know the time, you had to wear something that told the time.

Children today live in a digital world, so they can tell the time anywhere.

I don't need to wear a watch

Of course, you don't need a watch either, but you continue to make it a habit.

My daughter, Kate, is 20 and has never worn a watch.

I don't recognize the need for a watch

She says, "What is that one function?"

(laughs)

"That's not true. I know the date."

(Laughs) "Look, it's not multifunctional!"

Even in education, there are things we are trapped in.

Let me give you an example

One is that you start off with the idea of ​​a one-way road, follow a set course, do everything right, and the rest of your life is easy.

Everyone who's spoken at TED has implicitly or explicitly said otherwise, that life is more intertwined than linear.

In pursuing our talents, we live in symbiosis with those around us that help us grow.

But we are trapped in the idea of ​​a one-way road,

I think the biggest climax of education is getting into college.

to a particular university

I'm obsessed with the idea of ​​letting you in

I'm not saying don't go to college, it's not that everyone has to go right away.

maybe a little later

A while ago, I went to San Francisco for a book signing.

To a man in his thirties who bought me a book

"What do you do?" I asked

"I'm a firefighter"

"Have you been a firefighter for a long time?"

"I've been a firefighter for a long time."

"When did you decide to become one?"

Everyone wants to be a firefighter."

"But I really wanted to be a firefighter."

"When I entered the third year of high school, the teachers didn't take my career hopes seriously."

"I have a teacher who doesn't take me seriously at all.

The teacher said, "Being a firefighter is like throwing your life away. Go to college and get a specialty. You have great potential. Don't waste your talent."

"Because I was told in front of everyone in the class

I was so humiliated and disgusted

But I really wanted to be a firefighter, and as soon as I graduated, I applied to be a firefighter and fulfilled my dream.”

"I was thinking of the teacher when you were speaking to me earlier." "Because six months ago, I saved the life of the teacher."

(Laughter) "The teacher got into a car accident and I rescued him and gave him life-saving measures. I also saved his wife's life."

"I think they've given it some thought now."

(Laughter) (Applause) I believe that human society is built on diversity of talent, not on a single ability.

What is the challenge for us? . . (Applause) A key challenge for us is to reframe how we think about competence and intelligence.

I have a problem with the idea of ​​a one-way street, about nine years ago when I

When I moved to Los Angeles, I came across this slogan, well-intentioned, but it said, "University starts in kindergarten."

No way it's not

(Laughter) College doesn't start in kindergarten.

If you have time, I would like to talk to you, but I will stop.

(Laughter) Kindergarten starts in kindergarten.

(Laughter) A friend of mine once said, "A 3-year-old isn't half as good as a 6-year-old."

(Laughter) (Applause) Three-year-olds are three-year-olds.

But, as we heard in the last session, the competition to get into a "good" kindergarten is so fierce right now that there's an admissions interview, a three-year-old.

A child sits in front of a blank interviewer, who holds a resume in his hand.

(Laughter) (Applause) "Is this all you've had in 36 months?"

(Laughter) "There's no solid track record.

You were breastfed for the first six months, weren't you?"

(Laughter) It's silly to think about, but people are drawn to it.

Another problem is uniformity

We modeled our education system on the fast food industry.

Jamie Oliver gave a talk about that the other day.

There are two quality assurance models in the food service industry, one of which is fast food.

everything is standardized

The other is a Zagat restaurant or a Michelin restaurant, which offers non-standardized, regional service.

We've made education fast food. Just as fast food eats our bodies, education eats our minds and our vitality.

(Applause) Now, I would like to confirm a few things. One is that human talent is incredibly diverse.

all people have different talents

I recently discovered that when I was a kid, I had a guitar bought for me, and Eric Clapton had his first guitar around the same time.

All I can say is, well, it worked for Eric.

(laughs) I was no good.

I couldn't get a good tone no matter how hard I tried

it wasn't good at all

but that's not all

I had a different passion

People get better at what they really like

It's all about passion, it's all about what stirs your spirit and energy.

Time passes differently when you're doing something you love or are good at.

My wife recently wrote a novel, which is a masterpiece.

You know, when you're doing something you really love, an hour feels like five minutes.

On the other hand, five minutes feels like an hour if there's nothing that resonates with you.

A lot of people forsake education because it doesn't feed them, it doesn't inspire their energy and their passion.

So we need to change the model of education.

We need to move education away from the industrial, manufacturing model, which is linear, one-size-fits-all, and lumps people together.

We have to transform this model into a model based on agricultural principles.

We need to think of the way people develop their talents as an organic process, rather than a mechanical, automatic process.

You can't predict the outcome of a person's growth

All you can do is create the conditions for flowering like a farmer.

Educational reform, change cannot be made by copying the same system.

Characterized by tutoring like KIPP

there are some great models

It is important to personalize education according to individual situations and realities.

This is the solution that will lead to the future. Instead of pushing ourselves to find new solutions, we need to create a movement in education that allows everyone to find solutions that are tailored to their own circumstances, based on individual curricula and with external support.

This hall is filled with people who have great resources in business, multimedia, the Internet.

Combining these technologies with the competence of good teachers can revolutionize education.

I invite you all to join us in this educational revolution, because it's necessary not only for our future, but for the future of our children.

Education must move from an industrial model to an agricultural model, and schools will soon come back to life.

It is there that children find their way of life.

Homeschooling allows you to find a way to live at home surrounded by family and friends.

At this convention, many people talk about their dreams.

I just wanted to let you know that last night Natalie Merchant sang an old poem and I was so moved.

I'm going to give you a little bit of a short poem by W. B. Yeats, and you know who he is.

This poem was written for her lover Maud Gon Yeats laments that he is too poor to give her anything she wants

"I have a gift for you, but I don't think you will like it."

And "If I had a heavenly cloth sewn with light of gold and silver, If I had a heavenly cloth of black, gray, and sky blue, representing the night, the twilight, and the day, I would spread that cloth under your feet.

Every day, all over the world, children spread their dreams under our feet.

we must walk gently on it

thank you

(applause)

thank you very much

Italian fashion designer

Hear the amazing story of Miuccia Prada

she went to a vintage clothing store in paris with her friends

I found a Balenciaga jacket Prada loves it

inside out

I looked at the seams and examined the construction.

When my friend says "Buy it already"

"I'll buy it, but I'll make a replica," he said.

If any of you are academics, you'll think, "That's plagiarism."

But to the fashion savvy, it's clearly Prada's genius, being able to find the latest and trendiest jackets in the ever-changing world of fashion, without having to change a single inch.

You might also think that doing something like this might be against the law.

It's actually not legal

Intellectual property protection is almost non-existent in the fashion industry.

We have trademark protection, but we don't have copyright protection, we don't have what I would call patent protection.

All you really have is trademark protection, which means you can copy any of the clothes that someone else has here and sell it as your own design.

The only thing that cannot be copied is the trademark label on the item of clothing.

That's one of the reasons you see products with logos all over the place.

You can't copy the logo, which makes it difficult for the replica designer to copy the design itself.

But when I go to Santee Alley

there is

on Canal Street

Isn't this kind of fun sometimes?

Why is this happening? The reason the fashion industry doesn't have copyright protection is because a court a long time ago ruled that clothing was too practical to allow copyright protection.

We didn't want a few designers to own the key components of our clothing.

Because then the sleeves and the collar would also need a permit because someone owns them.

But too practical? Do you see fashion that way too?

This is Vivienne Westwood, but the answer is no.

Too ridiculous, too unnecessary

Now, if you're familiar with the logic behind copyright, that without ownership, there's no incentive to innovate, you might be very surprised by the fashion industry's decisive success and economic success.

What I'm going to argue today is that the lack of copyright protection in the fashion industry has allowed fashion designers to elevate utilitarian design, which is nothing more than body coverings, to art.

There's no copyright protection in this industry, so there's a very open and creative creative environment.

Unlike a sculptor, a photographer, a filmmaker, a musician, or someone else in the same creative field, a fashion designer can take any peer's design as a model.

You can choose any element from the history of fashion and incorporate it into your designs.

It is also known for arranging something from the trends of the times.

I think this is inspired by the costumes in the movie "Avatar."

maybe just a little

You can't even take the copyright of the costume

By the way, fashion designers, especially in the creative industries, tend to use whatever materials they can think of.

This wedding dress is actually made of broken spoons. This dress is made of aluminum.

It is said that when a person wearing this dress walks, it actually makes a sound like a wind chime.

It's a copy culture, so to speak, and one of its mysterious influences is the creation of trends.

Epidemics are magical, but how do they happen?

because it's legal for people to copy each other

Some people believe that a few people at the top of the fashion industry decide what we wear. But if you ask any designer at any level, including high-end designers, they'll tell you the same thing, and the main source of inspiration is in the city, where there are ordinary people in their own mix of styles.

This is where we actually get creative inspiration, which means that this industry is both top-down and bottom-up.

Now, perhaps the biggest beneficiaries of the fashion industry's lack of copyright protection are the fast fashion giants.

They're famous for copying luxury designs and selling them cheaply.

And we've faced a lot of lawsuits, and designers usually don't win.

The courts have said over and over again that we don't need more intellectual property protection.

When you see imitations like this, it makes you wonder how luxury brands are run.

Why pay $1000 for something you can buy for $200?

This was one reason why we had a meeting here in the U.S.C a few years ago.

The title of the conference was "Let's Talk Together: Owning Fashion and Creativity," and we invited Tom Ford to ask that very question.

this is his answer

By the way, he just landed a successful job as principal designer at Gucci.

Tom Ford: After a lot of research, no, it's not so much, it's a very simple research that shows that our customer base is different from the counterfeit customer base.

can you think

People in Santee Alley don't shop at Gucci.

(Laughter) It's a completely different audience.

And as you know, counterfeits are never exactly the same as the original luxury goods, or at least the materials are always cheaper.

But even the cheap stuff can actually have an element of attraction, and it can give some life to a dying trend.

Imitation has many advantages.

For one thing, many cultural critics point out that we now have a wider range of design options than ever before, thanks in large part to the fast fashion industry.

this is a good thing we need a lot of options

Like it or not, fashion is an expression of who you are.

Fast fashion has allowed global trends to be established more rapidly than ever before.

And that's actually good news for trend setters, because if the trend is established, the product will sell.

fashion conscious people want to be on the cutting edge

I don't want to wear the same clothes as everyone else

So we try to catch the next trend as soon as possible.

That's right, fashionable people don't have a day off

Every season designers have to struggle to come up with great ideas that everyone raves about.

And actually, this turns out to be a very good thing.

Now, of course, the influence of the culture of imitation on the creative process is multifaceted.

Stuart Weitzman, a successful shoe designer

He's been complaining about people trying to imitate him, but in an interview I read, he said he had to rethink his methods.

We had to create new ideas and products that were hard to replicate.

And he created Bowden, a wedge heel that had to be made out of steel or titanium, and in fact, if you made it out of cheap material, it would split in two.

I gave him a little twist, and it reminded me of jazz great Charlie Parker.

Do you know this anecdote?

One of the reasons he created bebop, he said, was that he thought it would be impossible for a white musician to imitate it.

They're trying to create a distinctive look and aesthetic that reflects the brand.

Anyone can tell if it's copied, because the style has already been announced on the runway, and the concept is cohesive.

i love this galliano

Let's keep talking, it's kind of like the comedy world.

I don't know if you know, but jokes aren't copyrighted.

Even if you have a very funny quote, anyone can plagiarize it.

But now there's a different kind of comedy.

Developing characters and unique styles just like fashion designers

And like fashion designers' designs, their jokes are funny only in that setting.

For example, if someone stole Larry David's jokes, it wouldn't be so funny.

Another thing fashion designers do to survive in a culture of imitation is to imitate themselves.

imitate my design

We're partnering with fast fashion giants to find ways to sell to an entirely different audience, the people of Santee Alley.

Some fashion designers say, "America is the only country that doesn't respect fashion designers.

In other countries, there are protections for artistic designs," some say.

But if you look at the other two big global markets, you'll find that the protections there are actually ineffective.

For example, in Japan, the third largest market, there are design laws that protect clothing, but the standard of novelty is very high, and you have to prove that the clothing has never been seen before and is absolutely unparalleled.

It's kind of like the novelty standard for US patents, which fashion designers rarely get.

Conversely, in the EU

The standard of novelty is very low. Anyone can register anything.

It's a mecca for the fast-fashion industry, and it's got a lot of high-end designers, but generally clothing isn't registered, and there aren't that many lawsuits.

This is because the standard of novelty is too low.

You can take someone else's dress and cut the hem three inches shorter and register it as a new unique design in the EU.

This won't stop copycat designers

Looking at the actual registration content, many registrations in the EU are

It's a Nike T-shirt with almost the same design.

But Diane Von Furstenberg didn't give up

As president of the Council of Fashion Designers of America, she has told members of the council that she intends to obtain copyright protection for her fashion designs as well.

Retailers are shrugging off this idea

I don't think this bill will move forward, because I know it's too hard to tell if it's a pirated design or just part of a global trend.

Who owns each style?

this is a difficult question

It requires a lot of lawyers and a lot of time in court, which the retailer decided was too expensive.

As you know, the fashion industry isn't the only one without copyright protection.

There are many other industries that don't have copyright protection, like the food industry.

You can't copyright a recipe because it's a collection of instructions.

Same with automobiles

You can't copyright an exterior design, no matter how quirky or cool.

because it's practical

The same goes for furniture. It's too practical.

I think magic tricks are also a set of instructions, like a recipe No copyright protection

There is no copyright protection even for hairstyles

When it comes to open source software, we've decided that it's better not to have copyright protection.

I thought it would be more innovative.

It is also very difficult to obtain the copyright of the database.

tattoo artists don't want copyright because it's not cool

design share

Jokes also have no copyright protection

Fireworks Rules of the game Not even the smell of perfume

Some of these industries may seem small, but this is the total revenue of the low intellectual property industries, the industries with very little copyright protection, and this is the total revenue of movies and books.

(Applause) That's a big difference.

(Applause) So when I talk to people in the fashion industry, they're like, "Shhh, actually we're designing each other.

Don't tell anyone you can steal

It's embarrassing"

But look, this is revolutionary, and it's a model many other industries might need to consider, including those industries that had very low sales.

Because right now, a lot of the industries that have copyright protection are in a situation where it's like they don't have any protection at all, and they don't know what to do.

When I learned that there are so many industries without copyright protection, I wondered what exactly the copyright doctrine is.

I wanted to see the whole picture, but lawyers wouldn't provide it, so I made it myself.

There are two main criteria in the logic of copyright law that seem to be dichotomy.

It's actually more complicated, but it looks like this

First, is it artistic?

so it deserves protection

Is it practical?

then it doesn't deserve to be protected

This dichotomy is difficult and unclear

The other is is it an idea?

Should it spread freely in a free society?

then there is no protection

Or is it a physically fixed expression of an idea created by someone who should be allowed to own it for a period of time and earn income from it?

The problem is that digital technology has obliterated the criteria that separate this "physically fixed expression" from the "concept of an idea."

These days, we don't think of books as something on the shelf, and we don't think of music as a tangible object.

it's a digital file

It's not associated with physical entities in our minds.

And because they're so easy to copy and transmit, they actually pervade our culture more like ideas than physical objects.

Now when we talk about creativity and ownership, the conceptual issues get really difficult, and this response shouldn't be left to lawyers alone.

Lawyers are smart

My boyfriend is also a lawyer and a good person

he is smart he is intelligent

But it should be done by a team of interdisciplinary people to thoroughly discuss and consider which models of ownership of the digital world are the most transformative.

And in my opinion, the fashion industry is the best place to start looking for models for the creative industry.

To learn more about this research project, please visit our website ReadyToShare.org

A big thank you to Veronica Juriki for making this presentation fancy.

Thank you very much

Today, I'd like to invite you to look at children who become suspected suicide bombers through a completely different lens.

In 2009, there were 500 bombings across Pakistan.

I spent that year working with children who were being trained to be suicide bombers, and Taliban recruiters, trying to understand how the Taliban were turning children into weapons, and why they were volunteering to do something like this.

I would like to share with you some of my latest documentary, "Children of the Taliban."

(Singing) The Taliban now run their own schools

They target poor families and persuade them to send their children.

Instead, they provide food and housing for free, and sometimes provide benefits to their families.

We have a propaganda video produced by the Taliban.

Young men are told about the legitimacy of suicide bombing and killing spies.

I came into contact with a child from Swat who was studying in a religious school like this.

Hazrat Ali comes from a poor peasant family in Swat.

He joined the Taliban a year ago when he was 13.

How are the local Taliban recruiting everyone?

Hazrat Ali: First, call us to the mosque and preach.

Then take them to a religious school and teach them about the contents of the Quran.

Sharmeen: After that, he said, the kids would go through months of military training.

Ali: I'll teach you how to use machine guns, Kalashnikovs, rocket launchers, grenades and bombs.

Taught to use only non-believers

Then teach me to suicide

Charmin: You want a suicide bomber?

Ali: If God gives me strength

Sharmeen: As far as I've done my research, I have the impression that the method of recruiting and training Taliban children is perfect, and it seems to consist of five steps.

Step 1 Target large, poor rural families as prey

They promise to feed, clothe, and shelter the children and take them away from their parents.

Then they send their children hundreds of miles away to harsh schools run under the teachings of the Taliban.

Step 2 Teach your children the Quran, the most sacred book in Islam, written in Arabic, which children cannot speak or understand.

Children are forced to rely on their teachers to teach them, but in my personal opinion, teachers seem to be sending distorted messages to suit their own convenience.

As a matter of course, children are forbidden to read newspapers that the school does not subscribe to, listen to the radio, or read books.

Any child found violating this rule will be severely reprimanded.

In other words, the Taliban are creating an environment in which children cannot receive any outside information.

Step 3 The Taliban teach children to hate the world we live in today

That's where they abuse their children. I've seen it with my own eyes. They give them dry bread and water twice a day. They rarely let them play.

Children are effectively prisoners of war, they can't leave, they can't go home.

Their families have no way of getting their children back because of their poverty.

Step 4 The Taliban seniors, the soldiers, begin to talk to the new recruits about the wonders of martyrdom.

They talk about how and when to die, being honored in lakes of honey and milk, being welcomed by 72 virgins in paradise, where there is endless food, and how this honorable act of martyrdom is a heroic tale among locals.

So the brainwashing campaign has already begun.

Step 5 In my opinion, the Taliban have the most effective means of propaganda.

Among the images they use are images of men, women, and children dying in Iraq, Afghanistan, and Pakistan.

The video basically explains that Western countries don't care about civilian deaths, so people who live in the Middle East, who support governments and work for the West, are easy prey.

That explains why civilians in Pakistan are easy prey, with more than 6,000 killed in the last two years alone.

Now children feel less hesitant about suicide bombing.

They have no hesitation in fighting because they have been taught that this is the only effective way to honor Islam.

I'd like to show you another excerpt

This boy's name is Zinora

blew himself up and killed 6 people

this boy is sadic

he took 22 lives

his name is mustu

28 people were killed

The Taliban run suicide bombing schools to prepare young men for atrocities against civilians.

You want a suicide bomber?

boy: by all means

But if your father gives you permission

When I see suicide bombers younger or my age, I'm very inspired by their great deeds.

Sharmeen: What benefits do you get from committing suicide bombings?

Boy: On Judgment Day, God will ask me, "Why did you do that?"

I answer, "God! I'm thinking of you!"

"I gave my life to fight the unbelievers."

Then God read my intentions

If it's about eradicating evil against Islam, then I can go to paradise

Song: ♫ Day of Judgment ♫ ♫ God will summon me ♫ ♫ My body will be spun again ♫ ♫ And God will ask me, "Why did you do that?"

A Taliban recruiter told me, "We always need sacrificial sheep in this war."

Thank you for your attention

(applause)

Are you worried about how you'll die?

Heart disease or cancer A car accident?

Many people worry about things they can't control, like war, terrorism, the devastating earthquake in Haiti.

So what is the real threat to humanity?

A few years ago, Professor Baclav Smir tried to calculate the odds of a sudden disaster of such magnitude that it would change history.

A catastrophic catastrophe, as he called it, is a disaster that could kill up to 100 million people in the next 50 years.

We found the probability of a world war, the probability of a massive volcanic eruption, or the probability of an asteroid hitting the Earth.

But the one that was most likely to happen, almost 100 percent likely, was a severe influenza pandemic.

Influenza is often thought of as a severe cold, but it can be deadly.

Seasonal flu kills 36,000 people in the United States each year.

Data for developing countries are incomplete, but deaths are likely to be much higher.

To make matters worse, viruses sometimes mutate so much that they essentially become like new viruses, and thus epidemics occur.

In 1918, a new virus emerged that killed between 50 and 100 million people.

It's like a fire in the wild. Some patients died within hours of onset.

Are we safer today than before?

It looks like we've managed to avoid the terrible epidemic that everyone was worried about this year, but this threat could come back at any time.

Fortunately, in our time, the combination of science, technology and globalization is opening up unprecedented possibilities: the possibility of making history by eradicating infectious diseases, which still cause one-fifth of all deaths and a great deal of suffering on the planet.

it is feasible

Current vaccines have already saved millions of lives, and the more widely available, the more lives we can save.

And newer and better vaccines could put an end to malaria, tuberculosis, HIV, pneumonia, diarrhoea, the flu, and other long-standing afflictions.

Today I'm going to talk about the success of vaccines.

First, let me explain why vaccines are important. The power of vaccines is like a whisper.

Vaccines go down in history, but after a while, they're almost unheard of.

If you're over a certain age, you probably have a little round mark on your arm from a childhood vaccination.

But these days, I don't worry about smallpox anymore, the disease that killed 500 million people in the 20th century has been eradicated.

Polio too. Does anyone remember the iron lung?

I don't see anything like this anymore, thanks to vaccines.

Now, what's interesting is that today, more than 30 diseases can be treated with vaccines, but HIV and influenza are still a threat.

Why?

there is such a thing

Until very recently, the details of how vaccines work were not clear.

The effect was confirmed by trial and error

You take a pathogen, modify it, and see what happens when you inject it into humans or animals.

This method is effective against many pathogens, and it works just fine against the nasty flu, but it's completely ineffective against HIV, for which humans have no natural immunity.

Let's see how the vaccine works.

Simply put, create a secret weapon for your immune system to use when it needs it.

It usually takes days or weeks after you've contracted the virus for your body to be fully prepared to fight back, and sometimes it's too late.

If you've built up immunity in advance, you're deploying forces in your body that can recognize and defeat specific enemies.

vaccines do that

So I'm going to show you a video, a video I'm showing for the first time at TED, that explains how an effective HIV vaccine works.

(music) Vaccines train the human body to recognize and neutralize specific intruders.

Once HIV penetrates the human body's mucosal barrier, it infects immune cells and proliferates.

The immune system's frontline forces detect intruders.

Dendritic cells and macrophages capture viruses and "present" their fragments.

When warned of an HIV invasion from the front lines, memory cells made from the HIV vaccine are activated.

This memory cell deploys the weapons needed immediately.

Memory B cells become plasma cells that produce a wave after wave of specific antibodies that perfectly match HIV, preventing HIV from infecting cells, while a battalion of killer T cells seek out and destroy HIV-infected cells.

the virus is defeated

Without a vaccine, it would take over a week to prepare these weapons.

In the meantime, the battle against HIV will have been lost.

Nice video, right?

The antibody you see in the video works the same way with most vaccines.

So the bottom line is, how can we get the body to produce the antibodies it needs against influenza and HIV?

The trouble with these viruses is that they're constantly changing.

Let's take a look at the flu virus

Influenza viruses infect using the different colored projections in this diagram.

It's also these protrusions that antibodies use to catch and neutralize viruses.

If the shape of the protrusion changes due to mutation, the antibody will not be able to recognize the virus.

That's why we get a different strain of flu each year.

So in the spring, we estimate the three most likely strains of influenza for the coming season, make a single vaccine, and rush it into production in the fall.

To make matters worse, influenza A, which is the most common, also infects animals that live in the vicinity of humans, and A also recombines in those animals.

Moreover, wild waterfowl are carriers of all strains of influenza.

So here's what happened: in 2003, there was the H5N1 virus, which was a series of isolated bird-to-human transmissions with an estimated fatality rate of 70 percent.

It was terrifying at the time, but luckily, the virus didn't spread easily from person to person.

The H1N1 virus that broke out in Mexico this year was deadly, infecting both humans and birds and pigs.

It was easily contagious, but luckily it was mild.

In some ways, we've been lucky so far, but at some point another bird may pop in.

Now let's look at HIV

Influenza is variable, but compared to HIV, it looks like the rock of Gibraltar.

The virus that causes AIDS is the most troublesome pathogen scientists have ever seen.

It mutates furiously. It has the function of decoy to evade the immune system, attacking the attacking cells and hiding itself in their genome.

This slide shows how the genes of influenza can change.

In the video above, an infected cell sends out a fleet of viruses.

There are a million warships like this among people who have just been infected, and each one is a little different.

Having a weapon that can identify and kill all of them is a real challenge.

In the 27 years since the HIV virus was identified as the cause of AIDS, more drugs have been developed to treat HIV than any other viral infection.

Even though these drugs don't cure you, the fact that being diagnosed with HIV is no longer a death sentence is a major scientific achievement -- an achievement for those who have access to it.

But the approach to vaccines is completely different.

The big companies got out of there because they thought it was really hard as a science and not as viable as a business.

It was once thought impossible to create an AIDS vaccine, but evidence is accumulating that this is not the case.

This September, we had some unexpected and exciting results from a clinical trial in Thailand.

The AIDS vaccine was the first to work in humans. Unfortunately, it's not very effective, but this vaccine was invented 10 years ago.

New ideas and early experimental results suggest even more promising results using appropriate animal models.

What's more, in the last few months, we've identified novel broadly potent neutralizing antibodies in the blood of HIV patients.

What does this mean

As I said earlier, HIV is mutable, but broadly neutralizing antibodies can bind to and inactivate several virus variants.

You can get these antibodies, and if you give them to monkeys, they'll completely protect you from infection.

What's more, these researchers discovered a new site where antibodies can trap HIV, and what's special about this site is that it's a site that changes very little as the virus mutates.

For example, the virus keeps wearing the same pair of socks no matter how many times you change them, so the next thing you need to do is make sure your body responds properly to these socks.

This led to the following situation

Clinical results from Thailand confirm that we can make a vaccine against AIDS, and the antibody characteristics suggest how to do that.

This strategy turns antibodies into vaccine candidates, and it's the first inverse strategy in vaccine research.

Called "retro-vaccinology," the possibilities here go far beyond those of HIV vaccines.

Think of it like this

We've identified a new antibody that also binds to multiple variants of the virus.

We know the specific site that this antibody binds to, and if we can figure out the exact structure of that part, we think we can use it as an antigen in a vaccine that can direct the human immune system to make antibodies that bind to it.

Hopefully, we'll have a universal vaccine for HIV.

Well, it's easier said than done, because the actual structure is something like this blue antibody binding to the yellow site.

If you have any useful ideas, please let us know.

Thus, research that begins with HIV will inspire innovation for other diseases.

Biotech companies, for example, are finding broad neutralizing antibodies, along with novel antibody targets against influenza.

Now, they're trying to figure out and formulate a combination of antibodies that can handle extremely severe flu.

In the long term, these retro-vaccinology tools could be used to create a preventative flu vaccine.

And from the point of view of rational vaccine design, the "retro-vaccine method" is just one method.

Let me give you another example

I talked about the H-type and M-type protrusions on the surface of the influenza virus.

Notice another small bump

it's mostly hidden from the immune system

It turns out that these sites also don't change much as the virus mutates.

So if you attack this site with a specific antibody, any kind of influenza will lose its function.

So far, animal studies have shown that you may have mild symptoms, but you can prevent severe symptoms.

If it worked for humans, it would be a universal flu vaccine that wouldn't have to be changed every year, and would protect against death.

Then the flu will be just a "bad cold"

Of course, no matter how great a vaccine is, it's useless if it doesn't reach everyone who needs it.

To do that, we have to combine better vaccine design with better means of production and better means of distribution.

remember a few months ago

In June, the World Health Organization (WHO) declared the first flu pandemic in 41 years.

The U.S. government has pledged to have 150 million doses of flu vaccine ready by October 15 to prepare for peak flu season.

He also promised vaccines for developing countries.

They spent hundreds of millions of dollars rushing to produce a vaccine.

What was the result?

How to make the flu vaccine, or the manufacturing technology, was developed in the early 1940s.

It's a slow and tedious process, the egg method, which uses millions of live chicken eggs.

Viruses only grow in living things, and chicken eggs were a great match against influenza.

For most influenza strains, one egg will produce one or two vaccines.

Fortunately, modern biomedicine has come a long way.

In such an era, the influenza vaccine

- It's made from chicken eggs (Laughter) from millions of eggs.

almost nothing has changed

Well, it's a reliable system. The problem is that we don't know if a strain of virus will grow.

This year's swine flu didn't grow much in the early days of production, producing 0.6 doses of vaccine per egg.

I'm worried about this

What would you do if that wild bird flew again?

If there's an epidemic of the type of avian flu that infects poultry flocks, there won't be enough eggs to make the vaccine.

Dan, if you're going to use hundreds of millions of chicken pellets to grow your fish, it looks like you can get them here.

Today, we can manufacture 350 million doses of each of the three strains of flu vaccine worldwide, and if we target just one type, like swine flu, we can increase that to a total of 1.2 billion doses.

Assuming the factories are operating properly, in 2004, just one contamination at one factory cut U.S. supply in half.

And the manufacturing process still takes more than half a year.

Can we really say that we are better prepared than we were in 1918?

New technologies are being developed, and I hope I can say, "Of course."

What if we could produce enough flu vaccines for everyone in the world for half the cost that the United States is currently spending?

With the latest technology it is possible

I'll give you an example. A company I'm associated with has discovered a special part of the virus that has type H spikes that activates the immune system.

If you cut this piece off and put it on the tip of another bacterium, you'd have a tremendous immune response, and you'd have a very potent anti-influenza drug.

This vaccine is so small that it can grow in common E. coli.

Bacteria, as you know, reproduce very quickly, like making yogurt. So, in a few factories, in a matter of weeks, we can produce enough swine flu vaccines for the world, at a fraction of the current cost, because we don't use eggs.

(Applause) Here's a comparison chart of these new vaccine technologies.

In addition to dramatically improved manufacturing technology and significantly lower costs, the E. coli approach I just described also saves time -- saving lives.

Developing countries are often left behind in their current flu response, so they're hopeful of these new technologies, and they're ahead of the rest of the world.

India, Mexico and other countries have already begun trialling influenza vaccines, and they may be the first countries to see these vaccines in action.

This new technology is so efficient and relatively inexpensive that if we could develop a distribution vehicle, we could reach billions of people with life-saving vaccines.

think about what happens next

New epidemics emerge and reappear every few years.

Someday, maybe soon, there will be a virus that threatens us all.

Will we be able to respond quickly before millions die then?

Fortunately, this year's flu was relatively mild.

One of the reasons I say "fortunately" is that very few people in the developing world were vaccinated.

If we have the political and financial foresight to continue our research efforts, we can harness these together with the new tools of vaccinology to ensure that we can produce enough vaccines cheaply for everyone in the world to ensure a healthy and productive life.

The flu doesn't kill half a million people a year.

AIDS doesn't kill two million people a year.

The poor and vulnerable don't need to be threatened by epidemics -- or anyone else, of course.

Instead of the great discontinuity of life that Baclav Smir is talking about, we can guarantee the continuity of life.

What the world needs now is a new vaccine, and this is possible.

thank you

(Applause) Thank you.

(Applause) Thank you.

science is progressing

Seth, I'd like to ask you -- what timescale do you think this will take place? Let's hear from the HIV side: does this revolutionary vaccine exist and work today?

Vaccines are ready to go. We've shown that vaccines work in humans, so now the only question is how to improve them.

We know that humans can make these kinds of antibodies.

If we know how, if we know how, we can have a vaccine, and there's evidence that we're getting clues about the problem.

Full speed towards the goal

Do you feel like it will take at least 5 years?

Most people say 10 years.

It's hard to draw a time line in scientific innovation, but the effort put in is showing results.

So what about a universal flu vaccine? Are you in a similar situation?

Influenza is different, and I think we've found a number of great, practical technologies that we can deploy right now.

The outlook looks good. The problem is that we've been focusing our development efforts on older technologies, because they're better understood.

Adjuvants can also be used

This is the European way, if you dilute the vaccine, it reaches more people, but as Michael Spector said, anti-vaccine advocates resist the use of adjuvants.

Is malaria lagging further behind?

No, malaria also has a vaccine candidate that has shown efficacy in early trials and is now in Phase III trials.

Maybe not a fully effective vaccine, but progress is being made.

Seth, a lot of people's work is something that you can feel good about, with something coming out every month.

I would like to express my respect to the research team for continuing this research for more than ten years.

i need people like you thank you

thank you

(applause)

When Chris asked me to come to TED, I turned it down, because I wasn't sure if I could make the kind of emotional connection that I thought I would.

It's a big conference

But he seemed to be in trouble and said he couldn't find the sex appeal and starlight that this conference needs.

That's why I said, Hey Ted... wasn't Chris.

I'm going out, but I have two conditions.

First, I want to give a speech in the morning, the sooner the better.

Second, I want to choose a theme for TED 2006.

How did that get you talking?

I've already decided on a theme for the next two years "Puppy's super cute photo book"

(Video and music) [Correct dance] [Basic twirl] [New school] [Old school] [I'm a daddy] [Riding a pony] [Did you fall in love with me? ] [ass pen pen] [stir the love pot] [this is okay] [words] (Applause) The placebo camera is my invention

(Laughs) Actually, I can't take pictures, but the price is exceptionally cheap.

(laughter) (cough) (laughter) "Hi, how are you? I wish you and your family the best.

(Inhales) I know you're surprised by this sudden letter, but please don't be too surprised, because it's the law of nature that you never know what's going to happen.

So I decided to get in touch with you to see if you're a safe and secure person, because maybe I'll have to entrust you with some money.

My name is Michael Bangla, the son of the late Tiam Bangla. My father was the Minister of Finance in Sierra Leone and was killed in the civil war.

(Laughter) Your country is economically good for investment, and your honest and trustworthy national character is good for business, so I have a proposal for you.

(Laughter) My father had a total of $2.3 billion before he died, and it was money he hid from rebel leaders during the war.

(Laughter) This money was supposed to be used to rebuild reservoirs all over the country, before the war started.

When the war began, the rebel leaders demanded the money, but my father insisted that he didn't have the money. He was killed because he refused to let go of the money.

So only my mother and I knew, for my father always trusted me.

(Sighs) I made an arrangement with a Red Cross refugee relief worker, and he brought the money to Freetown's Lanji Airport in his official transport vehicle, and he didn't know what was in the box.

(Laughter) The money is privately held in a trusted security company in Dakar, Senegal, for a temporary stay as a refugee.

I don't want to invest in Senegal because the economy is bad and it's too close to my country.

I need your help, and I'm sure you can help me. One is to become an anonymous partner and receive the funds in your trust account.

Sincerely, Michael Bangura

(Laughter) (Applause) I'm so embarrassed.

They asked me to talk in the dressing room for 18 minutes

But I only had 15 minutes to prepare

(Laughter) So if you don't mind, I'd like to buy you three minutes.

(laughs) (laughs) I'm really sorry.

(Laughter) (Applause) What's your name?

(Laughter) Mark Serfus

It's a good name, I feel like I'm chasing after happiness

(laughs) Are you a virgin? virgin?

In the sense that TED is new

(laughs) Is that so? Really?

Is it around 1000 or 2000?

picture?

I don't know what you're talking about

(Laughter) Um Mark (Laughter) Serfas

(laughs) 1860 hits What do you think?

It's nothing to be ashamed of

nothing to be ashamed of

(Applause) I was drinking with people who work at Google last night.

we were pretty drunk

(Laughter) So they said, Google's software is so advanced that they can predict what you're going to say based on how you use Google throughout your life.

I said, "Come on, it's funny"

(Laughter) So they said, "No, don't tell me."

But it's their mistake

"What will you say next?" and enter your name

you know

Let me tell you, this is unmodified software This is a real internet browser This is a real google page I'm going to try it now

"What was I going to say next?"

And "Zay Frank" that's my name

Omakase?

(laughs) Leave it to me?

Audience: Yes! yes!

(sighs) (laughter) Zay Frank: Great.

(Laughter) In March of 2001, (Laughter) I took a selfie dancing to Madonna's "Justify My Love."

On Thursday, I sent a link to the website that featured this clip to 17 of my closest friends as part of an invitation from me to their 26th birthday party.

(Laughter) (Ahem) By Monday, over a million people were visiting the site a day.

(Sighs) (Laughter) Within a week, I got a call from Earthlink telling me they had a 10 cents per megabyte overage charge and I had to pay $30,000.

(Laughter) Needless to say, I was able to quit my job.

[Fired] (laughs) So I ended up becoming a freelancer.

(Laughter) [Unemployed] But some people call me an Internet guru [idiot] Charismatic [loser]

(Laughter) I felt like I had a certain talent.

It's too deep to go into detail, but it's very hard to explain, and I've extracted the essence from complex philosophies (Laughter).

Like we can come back next year

(Laughter) I'm addicted to e-mail, I get a lot of e-mails.

Four years later I get 200-300 emails a day from people I don't know What a great opportunity to get to know a different culture

It's like looking at the world through a microscope

You can take a peek into someone else's life

And I feel like I'm getting cheers from regular users

For example, someone wrote, "Hey Zey, if you come to Boulder," "Rock out with us!"

[Rocking out] (video) (music) They said. "Thank you, Mr. Zay," but my lockout meant getting naked

(Laughter) So that was embarrassing.

But it's like a kind of collaboration between me and the fans, and I said okay

[naked lockout] (video) (music) (laughter) I can hear you whispering

(Laughter) I know what you mean.

How is his presentation going so well? Say

(Laughter) This year, it's also because of other people.

Maybe it's because of Chris, because for the past few years, it seems like we've had a lot of low-level speakers coming to TED.

I'm not sure, but

So this year Chris sent us a TED conference training device.

(Laughter) And that's why so many places accept us as speakers, so we can practice at home so that we're fully prepared for this kind of experience.

So I'm very honored to be here.

(recorded applause) I want to tell you a joke

(Pre-recorded applause and cheers) There's more than just applause and cheers

I can do a hoot mode

Spoken: You idiots, get off the stage!

Zei: You should get off the stage

(Laughter) Audio: Get Malcolm Gladwell out.

(laughter) (babies' voices) (sounds of admiration from many people)

(Hero's music) I just want to say one last thing. (Laughter) I want to say thank you to everyone here.

(loud music) (laughter) And frog mode.

(Frog croaking) (Singing) "The first time I fell in love with a shrimp" (Laughter) [Spam jokes are all the rage right now] (sighs) It's true.

I've had a few people say to me, "Hey, that's what you're doing on the internet right now."

(Laughter) So I said, "Mom, Dad." (Laughter) "You're trying."

I don't know if you're aware, but this video game market, kids are playing video games, but there's a ton of money.

There's probably about $100,000 or so each year that goes into that sort of thing.

So I decided to test my talent

came up with some games

(Laughter) The title is "The One Who Don't Believe in God."

I thought it would appeal to small children

good

Let's move around and say something

(Sigh) [Gameover replay not possible] (Laughter) It didn't go so well.

(laughs) I don't know why you're laughing

(laughs) I should have shown you before you said

``Buddhists'' are like ``non-believers''

(Laughter) But you'll come back to life as a duck.

(Laughter) This is great, because you can play for 25 cents for a long time.

(Laughter) And Chris said in an email that he wanted to bring something new to TED, something he hadn't shown anyone yet.

So I made one for TED, it's called "Christians"

Series third work

I hope this year goes well

(sigh) (laughs) Which do you prefer, top or bottom?

(Laughter) Good choice.

(Laughter) So we can wait for the second coming.

(Laughter) So what are you talking about?

tech fun

(Laughter) I get a lot of fun out of technology.

And actually, I'm serious about making things with technology, though I speak with a sarcastic voice.

Making things Making things actually gives me great joy

I love the process of making things It gives me a little breather from life's eternal anxiety It's like a project is like 80 percent done I know there's a little more to do But it's not done I can't start something that fills my whole life

So what I did was I became interested in creating an online social space, and I wanted to share that feeling with people who didn't consider themselves artists.

There is a culture of wanting a leader

Some software is hard to use Some unapproachable ones I feel like I have to read the instruction manual

So I want to make something that is very easy to use I hope they can express themselves ("The End" by The Doors) Huh! I'm on that web page, but it doesn't exist.

(Laughter) But that's not true. (Laughter) I want to create a meaningful environment where people can express themselves.

(Laughter) So I did a contest called "When I get attacked by office supplies."

(Laughter) Over 500 people signed up in three weeks.

toilet paper fashion

(Laughter) As you know, people all over the country

It's so wonderful to see something like this

(Laughter) Online drawing tools, you've probably seen a lot of these.

I think it's amazing

You can play with crayons

But I'm just as interested in the process of making things as I am in real life.

But the truth is that a lot of people aren't very good at drawing, and I mean, they all lose their temper and end up doing terrible things.

So I either end up quitting, or I draw something weird.

(laughs) "Scribbler" is a project to create a certain creative tool.

In other words, it's a helping tool

You can draw a simple stick shape, and you can draw something like a German copperplate engraving after the war.

(Laughter) I've found that the more clumsy things look, the better I can draw them.

Well then, let's start drawing

So, together in this process, the terrible can be seen as the beautiful.

I'll show you some of my favorites

It's the little marionette I got

wonderful

(laughs) cute

It's beautiful

it's wonderful

An 11 year old girl drew it and sent it to me

it's just gorgeous

(laughs) I'm serious

I'm not kidding

(Laughter) But I think this is really fun and great.

It's called "Fiction Project"

It's an online space, a repurposed bulletin board, that encourages people to collaborate and write fiction.

these are haiku

The haiku written here were not written by the same person.

Each line was written by a different person, separately

"Tie it and untie it, my cruel mistress will come near me and untie me, and that's it."

It's amazing, really, if you came home and your wife or husband said, "I need to talk to you," that would freeze you to the core.

(Laughter) So, in a way, this kind of small act is a way for everyone to get together and have fun.

It's like a kind of extra-curricular activity where we get to know each other.

Lastly, I love puppets

this is a puppet

I'll dance to the music

Lotte Reiniger, the great shadow puppeteer of the 20th century who started doing all sorts of fancy things.

That's why I became interested in puppets, and one last thing.

This is how puppets are made

(Applause) (Chris Andersen) Hey everyone, it was Zay Frank.

(applause)

Today I'm going to talk about what we can learn from conservatives.

I'm old enough to be nostalgic, so I'll let you all know that I was actually a conservative when I was a kid.

He was the leader of a teenage boy Republican.

I was the youngest delegation in the country when Ronald Reagan was the Republican presidential nominee.

yeah i know

(Laughter) “I searched the internet—”

"Not even on Wikipedia"

Well, this is just one example of how much information garbage is floating around the internet.

Wikipedia says a former congressman from Pennsylvania is the youngest leader, but that's not true.

(Laughter) No, let's fix it.

(Laughter) (Applause) Okay, yeah, perfect.

perfect

(Laughter) Lawrence Lessig

announcement and

it will be right

It's almost over now

“…youngest Republican”

save this

how's it going

This fixed

this is about this

(Applause) I want you to think about conservatism, not the '80 Republican Convention, but this: People go to church.

going to church

Not just for conservatives

talk about god here

I'm not going to

People go to church and do things for free.

have a potluck dinner

sell potluck dinner books

provide food to the poor

share, give, give for free

They're all alike, they're led by Wall St. firms, and they come every Sunday to share.

Not only food

What they have in common is a deep belief in the limits of market forces.

And I'm present at the site of opposition to market principles.

A relationship like this place

If you don't spend money, you're very welcome, otherwise it's like this

Conservatives want to regulate us and keep the market from expanding.

Even though I know the marketability of these places, I believe that they should be places where people can enjoy interaction without paying money.

Paid and free coexistence required

And conservatives are ecological.

Teddy Roosevelt, 20th-century Republican president and ecology advocate.

Taught that using natural resources is environmentally friendly.

I also preached the environment from an economic point of view.

They know that being economical is important in a cultural environment.

I want you to think about it

well you won't believe me

Look at this

Julian Sanchez, a libertarian working for the infamous Cato Institute.

his video skills

It's terrible, but the content is amazing

it has started

Julian: Let's observe the evolution of remix culture.

Larry Lessig: Explaining three videos

A remix of Cheeky Brats using Lisztomania

This quickly spread

was all the rage

(music) Somebody in Brooklyn

made something similar

(music) Then in San Francisco

thought the same

(music) Julian, what I want you to learn from this video.

the first is this

JS: This has deep implications

they're mimicking the original mashup

Really good point of view Editing is also good

And video in the community has the social power to get people involved.

If you've ever sang or danced with your mates, the video will resonate with you.

LL: So...

JS: It's very different from the early videos. Remixing is not a solo activity in the basement, it's a social creation.

And ultimately, it's the act of creating new things that change relationships with each other.

These mashups can come from everyday interactions.

Real social activities are sublimated into art.

LL: He makes two points

JS: First of all, remixes are about individuals using a common culture as a way to communicate with their peers.

Social remix is ​​used to mediate people's relationships with each other.

Each video presents a kind of archetypal bad boy as a social reality.

And by establishing a basic framework within which to compare the videos, you'll be able to better understand the differences and similarities within each group.

LL: OK, the most important thing is ahead.

JS: Copyright policy isn't just about how we encourage the production of things like art, but how much control we allow over the real world. Today's society is dominated by pop culture.

Art and popular culture are both public property that must be protected.

If you take the approach of offering a lot of only one, you run the risk of not being able to publish the better, more important work.

LL: Yes this is the point

Liberty requires commercial success through good commercial production and the opportunity to build a different culture.

For this reform, the idea of ​​fair use should be protected in two creative cultures, as he said, the commercial culture and the communal culture.

What he has is the culture

Democrats, on the other hand, have little connection with creative culture.

This famous company

Republicans started Good work is a thing of the past

All of Disney's works were either copyright-free or waited to be free and remixed to make it, so it was a wonderful display of creativity.

In fact, Mickey Mouse "Steamboat Willie" was made into "Steamboat Building" by Buster Keaton and became famous all over the world.

his remix talent

This kind of culture is to be admired.

But Disney sneaked up on the Democrats behind the scenes.

I do it differently

This mastermind passed the Copyright Term Extension Act, which extended the term of existing copyrights by another 20 years. Disney can't do what Grimm can do anymore.

We protested this, went to the Conservative Den's Supreme Court, and tried to block the bill, and one of the people we enlisted was Nobel laureate, right-wing Milton Friedman.

(Laughter) I signed "no idea" when the Democrats passed the bill.

As a side note, you might say that Sonny Bono is a Republican.

this guy is different

Here's an example: This hero is a famous leftist and the creator of this.

Lucas is soliciting "Star Wars" mashups on his site to unearth a new generation.

reading the consent

"All remixes belong to George Lucas"

The work belongs to Lucas

All of the music added in the mashup is available to Lucas, the rights holder, for free.

without knowing the creator

be deprived of rights

the creator is a sharecropper

Remember, the sharecropper's employer was a Democrat.

At this point, Republicans understood the need for ownership. They respected ownership, respected the creators and copyright holders, and the owners of this powerful work were not the generation of sharecroppers.

The lesson here is about tolerance.

our lives are shared, at least in part

Goldman Sachs president, at least in part

And to share, we need fair use protection.

The first condition is, the second condition is free use to create.

being able to create without anyone's permission

And third, respect the creators and give the remixers the right to directly benefit.

So this is right-wing, non-commercial Creative Commons.

It's not really, but please connect. Creative Commons is a system where you mark your work so that you know where it's free to use.

It's time to move away from ``holding copyright'' to ``holding certain rights''.

With this tool, you can clarify and share permissions, you can create freely with the permissions that have already been granted, and you can set copyrights that respect the author's rights and require no permission.

A widespread right-wing effort has permeated these licenses, and the number of creative commons-appropriate digital works is 350 million.

Now, this image shows a balanced creative environment. Is that the current environment?

as you all know it's not

Look at the real environment, just last week

I made a video on Wireside chat, and I uploaded it to YouTube.

I got an email with the warning that it "contains content owned by Warner Music Group and matches the work ID."

I didn't really think about it

Someone posted on Twitter that "copyright violation was intentional"

I sensed a deep conspiracy to expose the shortcomings of copyright law.

I answered "no"

When I looked at my site later, all the audio was gone.

The 45-minute video was muted, and it was a fair-use video that spliced ​​together audio snippets and included music by Warner.

Interestingly, the silent video had music ads.

You can buy music when it's all silent and you can't hear anything.

I taught fair use to make YouTube free under the current system.

Questions answered on this site

It's unusually childish to type all these words correctly and claim freedom of speech.

like a 3rd grader

Thumbtacks on the teacher's chair

to repeat that it is not placed

this is stupid

it's unreasonable

Have the courage to abuse the system of liberty

who is actually fighting?

In his online speech during the last presidential election, he was keen to challenge the regulatory system.

I'm John McCain

In response to YouTube's warnings and takedowns, he wrote dozens of letters demanding fair use be respected, and his campaign spread beyond the net.

Back to my story, when I was a stupid right-wing kid.

Right now, I'm a little left-leaning. I'm definitely left-handed. So will people on the left create an environment of free-use rights?

What the president is advocating is regulating the public with this strange law called the Millennium Copyright Act, which we're practically out of, but it's being enforced in other countries as well.

Not a single revision has been issued yet.

In this social system, there will be no change in the near future.

So we should learn tolerance.

listen to other values

need to talk

The value of free use rights

limit the regulation

respect the creator

If you learn these values ​​from the influence of the right, or if you embody these values ​​yourself, you'll get a little better.

Are the values ​​you learn from the left about health care practices and climate control laws?

Join me and let me teach you this

thank you

(applause)

The advent of the Macintosh twenty-five or six years ago was an amazingly big event in the history of man-machine interfaces and computers in general.

It fundamentally changed the way people thought about computers and computing, and it changed who and how many people could use it and how.

It was such a big change that in fact the early Macintosh development team around 1982-84 had to build a new operating system from scratch.

There was an interesting little lesson there, but that lesson has since been forgotten and seems to have disappeared, which is that an operating system is an interface.

An interface is an OS

Like the kingdom and the king in Arthurian tales, the two are inseparable.

Building a new operating system wasn't something that could be done on a whim.

It's not just a matter of tweaking your graphics routines

We didn't have graphics routines, we didn't have mouse drivers.

all had to be made

But in the quarter-century that followed, we saw an insane development of basic technology.

Memory capacity and disk capacity have grown on the scale of 10,000 to 1,000,000 times.

So is the processing speed of the processor.

And when the network Macintosh came along, there was no network, and now the network is the most important part of the computer.

And, of course, the graphics -- the $84.97 graphics device you can buy at the hardware store today is better than the $1 million SGI device just a decade ago.

A tremendous increase in power

And on top of that, we've got the web, we're getting the cloud, which is great, but the interface remains rudimentary and rather annoying.

Creating new interfaces is forgotten

But we're seeing a lot of change these days, and people are waking up in this regard.

So what happens next? Where are you going?

The key to the problem is one simple word, "space," or one simple phrase, "geometry in the real world."

Computers, and the programming languages ​​that tell computers, are horribly indifferent to space.

does not understand real space

This is strange because we ourselves are very good at dealing with space.

Computers also don't understand time, but that's another story.

So what happens when you teach a computer about space?

One of the answers would be something like "luminous room"

A Luminous Room is a system in which the input and output spaces are co-located.

It's a strangely simple and still underexplored idea.

When you use the mouse, your hands are on the bottom, on the mouse pad.

It's not even on the same plane as what you're dealing with Pixels are above the display

It's a room with walls, floors, pets, potted plants, things that not only display, but also react to each other.

The input and the output are in the same space, allowing this kind of thing.

Store digital information in physical containers

The rules here are the same as the actual container in the real world.

You have to take out whatever you put in

This little design experiment has a few other gimmicks.

When I put the chessboard on, I try to understand what that means.

And when there's nothing left to do, the chess pieces eventually get bored and go away.

In the eyes of academics, this work seems too sleazy, so we've also created some very serious applications, like an "optical prototyping workbench," where a toothpaste tube cap attached to a cardboard box emits a laser.

The physical objects represent beamsplitters and lenses that show the path of the laser beam.

An interface without an interface

In this world, just like in the real world, you can control it with your own hands.

Similarly, in this "digital wind tunnel," the digital wind is blowing from right to left.

But when it's on a CRT or an LCD screen, it doesn't make sense to put a real object there.

Here, the real world and simulation are mixed.

And finally, we took everything and created a system for urban planners called Urp, where we wanted to put back into the hands of architects and city planners the models that were taken away when we created CAD.

Machines make up for only half of reality

Shows digital shadows as you can see

And if you bring a "clock tool" like this, you can control the position of the sun in the sky.

this is shadow at 8am

Shadows get a little shorter at 9 o'clock

You can move the sun like this

Shadows are much shorter at noon

I built various tools into this

With it, even children can explore the effects of shade, and they don't have to know anything about urban planning.To move a building, you just have to reach out and move it.

"Material Stick" makes it reflect light like Frank Gehry's work

Will the building blind passers-by and drivers on the road?

The "Plot Tool" connects distant buildings and roads

Will I be sued by the City Planning Commission?

If this idea sounds familiar or a little dated, that's fine, it should be.

This work was made 15 years ago.

It was created under the wonderful direction of Professor Yutaka Ishii, who leads the Tangible Media Group at the MIT Media Lab.

And this caught the eye of world-famous production designer Alex McDowell.

Alex was working on a vague, indie experimental film at the time, "Minority Report," directed by Steven Spielberg, and he invited us from MIT to design an interface for the film.

And what's great about it is that Alex is so serious about authenticity that he let us do the design work like research and development to make the movie's 2054 world as realistic as possible.

The result has been very satisfying and of lasting value.

People still refer to the "Minority Report" scene when it comes to new UI designs.

And that led me in a strange circle to the idea of ​​what we see as the inevitable future of man-machine interfaces, the spatial manipulation environment.

there are a lot of images here

You can use your hands to navigate with 6 degrees of freedom

Fly freely between Mr. Beckett's eyes

Then it's back among the menacing orangutans.

it's very good

let's do something harder

there are various images

can fly around

Navigation is a fundamental problem

Must be able to navigate 3D

A lot of what we want to do with computers is inherently spatial in nature.

And by making the non-spatial things spatial, we can make them more understandable to our minds.

You can arrange this in many different ways

It can be expanded like this Reset

Let's arrange them like this

Of course, not only can you navigate, but you can also operate.

If there's something you don't like, or something that's particularly interesting, you can set aside Ernst Haeckel's scientifically distorted picture like this.

When I analyze it, I pull it back a little and reposition it.

Let's move down a little bit and take a look

this is also one way of looking at

Analysts might want to look at this as a color histogram.

I tried arranging them according to color Colors and angles are associated

If you want to make choices in this three-dimensional space, it's important to track your hand in real space, because what we're touching is not two dimensions, it's not pseudo-three dimensions, it's three dimensions.

using this selection plane

I did some logic and took out my favorite yellow and green grass tapirs.

Now let's look at the real world of work.

This is part of the logistics system we're building right now.

there are a lot of elements

The key here is to combine traditional tabular data with three-dimensional geospatial information.

It's a familiar place

bring me the table

select some

graph it

Now move over here and get closer...

It shows the logistics elements scattered all over America.

The idea of ​​three-dimensional interaction and spatial computation could break down the deplorable one-to-one relationship between humans and computers.

The old way, the old convention: one machine, one person, one mouse, one screen.

that can no longer stand

In the real world, work is collaborative. You have people to work with, and you have lots of screens.

I have a lot of images to see

you may want someone to help you

The author of this new pointing device is sitting over there, and you can move the image from here to there.

between different machines

Computation transcends space and networks and blends in

I have something to ask Paul, so I'll put that aside.

Paul is the designer of this stick, so it might be quicker for him to come out and explain.

clean up here

I'm going to take this apart and take it apart further.

Kevin can you help me

Let's see if we can find the circuit board

It's kind of like a gun disassembly exercise, which I do all the time in the lab.

okay

Collaborative work is always important, whether we're co-located or remote.

And things have to be seen in the context of space.

Finally, I want to return to the world of film and show you something.

It's a system called TAMPER, and it's a little weird piece of equipment that gives us a glimpse into what the future of media editing and manipulation might look like.

At Oblong, we believe media should be accessible at a much finer granularity.

There are many movies in this

let's get some stuff

What's good, run your eyes quickly

Cut out the element, play it again and drag it to this table.

Then I pick a guy in blue from a Jack Tati movie and pull him to the table as well.

How many people should I have?

And maybe I want a cowboy, frankly.

(Laughter) Let's get this guy to come over.

(Laughter) As you can see, the system knows that cowboys and Frenchmen don't get along.

The last thing I would like to say is that the greatest English-speaking writer of the last 30 years has said that good art is always a gift.

He's not saying a novel costs $24.95 or $70 million to buy back a stolen Vermeer painting. He's talking about the state and state of art creation.

I think it's time for us to do the same for technology.

Technology can express and imbue a kind of tolerance, and we should really seek it.

At the heart of all this technology is a combination of different designs, which is very important.

Unless design, utility, and effect are built into it from the beginning, we no longer use technology.

I can't move forward

We humans are creatures of making things, and our machines should help us do that and live up to our image.

Thank you very much

(Applause) I'd like to ask the obvious question... Bill Gates, when? When will it come true? For ordinary people, not in the lab or on stage?

Is this for everyone, or is it for corporations and filmmakers?

this is for everyone

that is what we are aiming for

If you don't take that big step, you won't be successful.

It hasn't changed in 25 years.

Is it really enough to have only one interface? it can't be

But do we all need projectors and cameras on our desks and in our homes?

How do you do that?

Will be built into all displays

built into the architecture

Gloves will be obsolete in months or years

this is the inevitable direction

Do you think in five years people will be able to get this as part of a normal computer?

I think in five years, you'll be able to get this if you buy a computer.

that guy is amazing

(Applause) We've always been amazed at how things like this are used.

What do you think will be the first killer app for this?

Good question. We think about it every day.

Right now, our early adopter customers and real-world systems are dealing with big, data-intensive, data-centric problems.

Things like supply chain logistics, natural gas and resource extraction, financial services, pharmaceuticals, bioinformatics, and so on, but I don't think they're killer apps.

I understand what you are saying

There are martial arts, games, and so on.

(Laughter) John, thank you for making science fiction a reality.

It was an honor to be invited.

Thank you everyone

(applause)

Today, I would like to share with you some stories of the ocean that I have seen through my work as a photographer for National Geographic magazine.

I think I became an underwater photographer and photojournalist because I fell in love with the ocean as a child.

I wanted to tell you about some of the most amazing creatures I've seen in the sea and their interesting habits.

I've been here for 30 years, and I've explored the ocean for 30 years, and I'm still amazed at the incredible things that happen there.

But recently, I've been seeing more and more frightening things under the sea. It's something that a lot of people don't know.

I kept taking pictures to properly communicate the problem.

I want you to see the wonderful world under the sea and what is happening there now.

In my first article for National Geographic, the first article that I wanted to bring environmental issues into nature articles, I suggested an article about harp seals.

The original story I wanted to make was simple, focusing on seals that migrate from the Canadian Arctic to the Gulf of St. Lawrence for a few weeks each year to court, mate and give birth.

They all depend on the ice floes being moved by the wind and tide.

I'm an underwater photographer, so I wanted to write this article from both inside and outside of the ocean with these photos of baby seals swimming in -29 degrees Celsius water for the first time.

However, as the interview progressed, I noticed two major environmental problems that cannot be ignored.

One is that 8- to 15-day-old seals are being hunted one after another with hakapiku (seal hunting tools).

Hundreds of thousands of seals are killed each year. This is the largest slaughter of marine mammals on earth.

This worries me, but the biggest problem for harp seals is the loss of ice due to global warming.

This is an aerial photograph of the Gulf of St. Lawrence taken during seal season.

This photo shows a lot of ice, but you can also see the surface of the sea here and there, which you couldn't see before.

And the ice became very thin.

A pup needs a solid, stable ice base to be cared for by its mother.

Seals stand on their own just 12 days after birth.

However, without waiting for the 12th day, he falls into the sea and dies.

Here is a picture of a 5-7 day old seal pup, which still has its umbilical tail, missed the thin ice and fell into the sea. The mother desperately pushes her baby up to get her back on the scaffolding.

This kind of situation has increased year by year since I started shooting.

Last year, I heard that in one area of ​​the Gulf of St. Lawrence, pup mortality was 100%.

Clearly, many problems have been exacerbated.

This article became the cover story for National Geographic.

As a result, it has garnered a lot of attention.

This made me want to look into other issues that are happening in the ocean.

I suggested an article about the fish crisis. The reason is that we've seen a significant decline in marine ecology in the last 30 years, and I've read in scientific journals that 90 percent of large fish have disappeared in the last 50 to 60 years.

Large fish are tuna, marlin, and sharks.

I couldn't believe the numbers.

I thought this would make the front page of each media, but it didn't. So I thought I'd write an article from a different angle.

I came up with the idea of ​​showing the readers what is happening to the creatures in the world's oceans using shocking photographs that look like war photographs.

In the early days, I wrote articles to encourage readers to appreciate the sea creatures they were eating.

Suppose you order a steak at a restaurant. We all know where steak comes from. Even if you order chicken, everyone knows what chicken is. But do you know what a wonderful creature you order bluefin tuna sashimi?

They are like sea lions and tigers.

In fact, they are so unique that no two animals are alike.

Bluefin tuna can swim from the equator to the North and South Poles. And it can circle the earth twice in a year.

If it hadn't been for the overfishing of the past, tuna would have survived to the end of their lifespan, and there would have been 30-year-old tuna weighing a tonne.

However, in reality, the number of bluefin tuna has declined worldwide because of overfishing.

This is a picture I took a few years ago of the auction at Tsukiji Market.

In this way, tuna and bluefin tuna are piled up miserably in many warehouses every day.

As I continued to walk around and take pictures, I felt that the sea was not a supermarket.

In the future, you have to catch it while thinking that it will be a serious situation.

I also wanted to show you some fishing methods in this article. One of them is the trawling used all over the world.

This is a small net used for shrimp fishing in Mexico, but the bottom trawling system is pretty much the same everywhere.

It has a large mesh in the center with metal doors on each end.

If you drag this tool in the sea, the door will open due to the resistance of the water. A float is attached to the top of the net, and a lead line is attached to the bottom.

And this time it drags on the seabed to take shrimp.

As you can imagine, it also catches creatures other than shrimp up to the root.

And this also destroys the valuable ecosystems on the seafloor, environments that are vital to other animals, such as sponges and corals.

Here is a picture of a fisherman holding shrimp after an hour of trawling.

I think I caught about 7 or 8 shrimp. The fish on the boat were netted together.

These fish will die in this fishing, but they will not be sold.

7 or 8 prawns and the lives of about 4 kilos of fish that died from fishing. That's the true price of prawns for dinner.

To make it more visual, I filmed a man shoveling dead fish into the sea from underneath a fishing boat. I was able to take a picture like this waterfall of death. The guitar shark, the ray, the flounder, the puffer fish, which were alive and well on the ocean floor an hour ago, are now thrown back as garbage.

Next, I wanted to focus on shark fishing. Today, more than 100 million sharks are killed worldwide each year.

Before I took the picture, I wondered how I could take a picture of a dead shark that would resonate with readers. Many people still think that the only good shark is a dead shark.

One morning, while diving, I found a recently dead thresher shark caught in a gillnet.

Its pectoral fins and eyes were still alive, and for a moment it overlapped with the crucifixion.

This photo was the top photo in National Geographic's Fisheries Feature.

I would be very happy if this article was an opportunity for readers to pay attention to the problem of 100 million sharks.

I love sharks, so I thought it might be a little sick, but I also wanted to write a brighter shark article as a way to discuss the need for shark conservation.

That's why I went to the Bahamas. The Bahamas is one of the few places in the world where sharks can thrive. Bahamian fish are pretty healthy. The main reason is that the local government outlawed longline fishing a few years ago.

We have been to several locations to show you some of the species that we don't normally cover in this magazine.

One of them is Tiger Beach, located in the northern Bahamas, where tiger sharks live in shallow water.

Here's a low-flying photo of a diving boat with a dozen or so big tiger sharks swimming right behind it.

I never wanted to portray sharks as monsters in this article.

I didn't want it to look overly scary or offensive.

In this photo, maybe 15 or 14 feet, I think I've achieved my goal with this photo of a beautiful female tiger shark. This shark swam with the little barjacks and shadowed my face with my flash.

It's calm, not too scary, and respectful of the animal.

Next, I interviewed hammerhead sharks, which had hardly been captured on film until about 7-10 years ago.

Hammerhead sharks are solitary animals.

In Florida and the Bahamas, there is a lack of scientific information about this shark.

We know almost nothing yet.

Where they come from and where they go Where they mate and give birth are still unknown. In the last 20-30 years, 80% of the Atlantic hammerhead sharks have died.

Before we know more about this shark, it will be dead.

This is a picture of a whitetip reef shark. Whitetip reef sharks are known to be the fourth most dangerous animal in the world.

However, 98% died out in most habitats.

Since this is a deep-sea animal in the open ocean, and we don't work on the seafloor, we set up a shark-watching cage, and my friend, shark biologist Wes Platt, went inside.

The photographer who took this photo is not in a cage. Apparently biologists are a little smarter than photographers.

At the end of the shark story, I would like to pay attention to the growth of baby sharks.

I interviewed a baby lemon shark on Bimini Island in the Bahamas.

This is a picture of a baby lemon shark. They spend their first few years in mangrove forests, which provide a safe environment.

I think this is a photo that doesn't look like a shark.

It's a different impression than usual.

Sharks about 25-30 cm in size are swimming in shallow water.

This is the most important habitat for sharks during their growing years before they can come out onto the reef.

After Bimini, I learned that this habitat would be bulldozed and turned into a golf resort.

There are also several articles highlighting representative species that are endangered by other threats.

One of them is a leatherback turtle documentary.

It is the largest species of sea turtle, has a wide range and is excellent at diving, and is also the oldest species of turtle.

A female slowly crawls out of the sea in the moonlight to Trinidad.

The lineage of this animal dates back to 100 million years ago.

There was a time when we landed, laid eggs, and watched Tyrannosaurs run around.

Now you can crawl up and see the apartment.

However, despite its amazing lifespan, it is endangered.

In the Pacific Ocean, where this picture was taken, 90% died in the last 15 years.

In this photo, a baby turtle is about to break out of its shell, taste seawater for the first time, and begin a long and dangerous journey.

Only 1 in 1000 of them can grow to adulthood.

This is due to predators such as hawks waiting on the beach and carnivorous fish offshore.

Nature compensates for this, females have many ovaries and are designed to overcome difficulties.

However, it cannot deal with man-made stress. This fishing of leatherback turtles with gill nets at night is one of the human-induced stresses.

I jumped into the ocean and took this photo. Then, with the fisherman's permission, he cut the turtle out of the net and set it free.

But thousands of leatherback turtles each year don't have that kind of luck. Their future is at stake.

I also made an article about the right whale as another special creature.

About a million years ago, there was only one species of right whale on Earth. But the movement of land has isolated the oceans and divided the species. And it was divided into two types today.

The Southern Right Whale and the North Atlantic Right Whale that you can see here. This is a photo of a family on the coast of Florida.

Both species were once driven to the brink of extinction by whaling, but the southern right whale has largely recovered. Because they live far away from humans.

The North Atlantic Right Whale is currently listed as one of the most endangered species. Because they live along the eastern coast of North America, they are called urban whales and suffer from urban pollution.

Here's a shot of the Florida coast at sunset with my head out of the water.

There is a thermal power plant in the background.

Urban whales have to deal with toxins and drugs that are washed into the ocean, and their fertility may be affected.

There are times when I run into fishing gear.

This is the tail fin of a right whale.

The white mark is not a natural product

It is a wound that was entangled in the device.

72% of right whales have scars like this, but in many cases they are left entangled in lobster and crab traps.

In that case, you will eventually die.

Another problem is colliding with ships.

A photo of a whale that collided with a ship in Nova Scotia, Canada. They will be beached and an autopsy will be performed to prove that the actual cause of death was a collision with a ship.

All of this has hindered the increase of this species and the Atlantic right whale is on the verge of extinction.

I headed to the Auckland Islands, which border New Zealand's Antarctic Circle, to study the unspoilt Southern Right Whale, which had just been discovered about 10 years ago, in order to compare it with the polluted North Atlantic Right Whale.

It was winter when we went.

He was an animal that had never come into contact with humans, and he might have been the first human I met.

Interacting with whales underwater I was amazed by their curiosity.

A magnificent bass-like whale, 13 meters long and weighing 70 tons, swims alongside the assistant standing 21 meters below the seafloor.

They were in perfect shape. Healthy, fat, sturdy, no blemishes from fishing gear, just what it should have been.

I've heard that when settlers landed at Plymouth Rock, Massachusetts in 1620, they were able to walk on the back of a right whale across Cape Cod Bay.

Today, we cannot see such a sight, but we may be able to preserve what is left behind.

I would like to close with a story of hope. In a story about marine conservation, it could be the solution to overfishing, the fish crisis.

I decided to do the interview in New Zealand. New Zealand is relatively advanced in terms of protecting its oceans.

This story has three things to do. biodiversity and biodiversity and resilience.

There is a reserve called Goat Island in Lee, New Zealand. I interviewed here first.

In 1975, when it was first designated as a marine protected area, it was hoped that some species of fish, such as the black sea bream, which had been hunted for commercial value and threatened to become extinct, would recover.

Local scientists told me they had high hopes. As a result, the fish recovered.

And at the same time something unexpected happened.

For example, this fish eats sea urchins. After this fish disappeared, the seabed was filled with sea urchins.

After the fish came back, the number of sea urchins was controlled and there was even a seaweed forest in the shallows.

Sea urchins eat seaweed.

By the control of the sea urchins by the fish, the ocean returned to its natural state of equilibrium.

No one can tell me, but I think the sea was like this 100 or 200 years ago.

Then we went to beautiful and fragile reserves in other parts of New Zealand. Fiordland, where sea turtles were found.

A small blue cod is swimming while leaving a line of color.

I dived in the sea where the water temperature is a little higher in northern New Zealand. So I photographed this large stingray-like ray swimming through an underwater canyon.

From tiny nudibranch-like creatures crawling on sponges to filefish, the ecosystem here seems to be very healthy. Filefish are very important creatures in the ecosystem as they clean the seafloor and promote new life.

I will end with this photo. One stormy day, I lay on the seabed and enjoyed watching a school of fish swim by me.

It's a protected area and it's only been 20 years.

A local diver who has been diving for many years said that the sea conditions are better now than they were in the 60's.

It's because the fish are coming back because they were protected.

It is clear from this story that

The ocean is to some extent generous and resilient, but we must manage it.

I became an underwater photographer because I fell in love with the ocean. I take pictures because I want to protect the ocean. I don't think it's too late even now.

Thank you for your attention.

Tom Green: That's 4chan

Internet-loving kids say weird words like "barrel roll."

How to move in the game "Star Fox"

"Star Fox 20?" (Assistant: "Star Fox 64") Tom Green: Yeah, they tease me all year

I'm honestly going insane

Sometimes I wake up in the middle of the night and yell "4chan!"

Christopher Poole: When I was 15 I found a website called Futaba Channel

It's on Japanese forums and imageboards

At that time, the format of the forum was not well known outside of Japan.

So I imitated it, translated it into English, and put it out there for my friends to use.

And now, six and a half years later, more than seven million people are using it, and they're posting 700,000 posts every day.

And it grew from one board to 48 boards.

It looks like this

What's unique about this site is that it's anonymous and doesn't have the ability to save content.

No archives No barriers No registration required

The feature you've been familiar with on the forums doesn't exist on 4chan

That's why they're posting completely raw information with no filters.

This site is known for that, and it's this environment that has created an internet phenomenon called "memes," like viral videos.

Two of the biggest memes to come out of this site, as some of you may know, are pictures of cats with funny text called LOLcats.

There are tens of thousands of these out there, and it resonates with a lot of people, and there's a vast blogging empire out there that's obsessed with photos like this.

There's also been a resurgence in popularity for Rick Astley in the last two years.

There's a very simple old-fashioned trick called rickroll.

Somebody says it links to something really interesting, and when you click it, it brings up an '80s pop song, and that's it.

It got so popular that Rick Astley jumped onto the floats of last year's Macy's Thanksgiving Day parade and performed a lickroll in front of a large crowd.

(Laughter) The site spawns a lot of memes.

Only a handful of the ones I've shown you are popular, but people are creating more and more of these every day and every month.

So what are the rules for sites like this?

Yes, there are codified rules that I've come up with that the community generally ignores.

And they came up with their own set of rules called the "Rules of the Internet."

I would like to introduce three specific things to you.

The first rule is don't talk about /b/

The second rule is don't talk about /b/

And I think the last rule is interesting: if it exists, there must be porn about it.

(Laughter) I will refrain from the contents of this slide.

because you are absolutely right

/b/ is the first board when we started, and in many ways it's the heart of the site.

where one-third of the traffic occurs and

/b/ isn't just the meme that originated there, it's known above all for its feats.

Chris just mentioned one of them, and that's Time magazine's "Top 100 Most Influential People" poll.

Somebody at Time magazine thought it would be interesting to nominate me for this poll last year.

So they put me on the list, and the internet sniffed it out, and my community wanted me to be number one.

I didn't tell them, they just wanted it.

An approval rating of 390% is not bad at all.

(Laughter) They hijacked the voting system.

I ended up in 1st place

And I was invited to such a stylish party

But it's not this that's interesting

They didn't try to get me to the top of this list, but they actually took the top 21 and replaced it with a game that spells "mARBLECAKE. ALSO, THE GAME."

(Laughter) The amount of time and effort put into it is truly remarkable.

"marble cake" is significant because it's a channel name organized by a group called "Anonymous"

"Anonymous" is a group that has become very famous for protesting against a group, and that group is Scientology.

Here's the story: Scientology released an embarrassing video featuring Tom Cruise that was leaked online.

I turned some net users into enemies by deleting it

And so, in less than a month, 7,000 people organized in cities around the world, this is Los Angeles, protesting the Church of Scientology.

they are still protesting

(Laughter) This kind of grassroots activism group came out of the site.

Finally, I would like to introduce you to the story of a cat named Dusty.

Dusty is the name I gave this cat

This young man posted a video on YouTube abusing his cat.

People expressed their displeasure about this, and there was an outpouring of help to do something about it.

An Internet detective who puts the crime scene to shame has appeared.

find his myspace

Matched with Youtube videos

And within 24 hours they identified him by name, and within 48 hours he was arrested.

(Applause) What I find really interesting is that communities like 4chan are open squares.

not filtered

Sites like this are currently doomed like dinosaurs.

The trend is toward social networking, and it's on the brink of extinction.

The trend is toward real-name society

Our society is moving toward accepting a lack of privacy.

By going in such a direction, we are about to lose many important things.

thank you

(Applause) Chris Anderson: Thank you.

i have a few questions for you

If you ask me, the TED website never crashes, right?

CP: I'm glad this isn't being streamed live to them right now.

CA: Well, I don't know, people in 75 countries are watching.

don't tell them

But seriously, this problem of anonymity is, as you argued,

It basically gives people permission to say anything and there are no rules.

issues such as child pornography

Have you ever had sleepless nights and regretted opening Pandora's box because you have to deal with it?

CP: I can't say

There are as many bad things that come out of this environment as there are good things.

There are also many negative aspects

But there's a better side than that. There are now very few places where you can hide your identity and remain completely anonymous and say what you want.

And being able to speak freely is important.

There are limits to what you can do as you please

I think it's important that a place like this exists.

I get emails from people saying, "Thank you for giving me this place to come home from work and be my authentic self."

CA: But some of the statements and opinions are constructive, and some are really offensive.

Isn't there a huge risk if the connection between what is said and where it comes from is broken?

CP: It certainly exists

But - CA: You probably posted on the board about what to talk about at TED today, right?

CP: Yes I made a thread on Sunday

Over 12,000 responses were received within 24 hours.

This presentation doesn't reflect that, because I can't share what they said here.

(Laughter) Because 99 percent of the content isn't broadcastable.

But there are some useful comments.

(Laughter) You suggested love and peace.

CA: Your proposal about love and peace was in quotation marks, right?

CP: You also mentioned dogs and cats.

CA: That content is no longer on the board, is it?

Or do you still have it?

CP: That thread has been around for days

It climbed to 16,000 posts and is now deleted.

CA: I see

Now, I don't know if I should encourage everyone at TED to necessarily check it out right now.

Chris, you yourself are a person of interest to many people.

You've got amazing influence in the semi-underground world, but you're not yet on your way to making money.

Do you have a future business plan?

CP: I don't really have a business plan.

The site has adult content

Some content is literally obscene.

You're right, I'd say we're a long way from making money.

CA: You still live at home, right?

CP: I actually moved recently.

CA: that's great

(Applause) CP: I've moved away from my mother, and now I'm back in school.

CA: What kind of conversations do you have about 4chan with your mother?

CP: In the beginning, it was a very embarrassing, awkward conversation.

Even if the content is small, it is not the content to talk about at the dinner table

But I think the reason my parents allow the site is because they don't really understand it.

(Laughter) CA: You must have been very happy when you were voted #1 by Time magazine.

CP: Yes, but you didn't know what to think of it.

(laughs) CA: What do you think you'll be doing in 10 years?

CP: That's a good question

Like I said, I'm back in school now, so I'm planning to do urban studies first, and then I'm going to study urban planning and then apply what I've learned in online communities to real communities.

CA: Chris, thank you, that was very interesting. thank you for coming to TED.

We live in economically difficult and trying times.

I think one of the first things that will be affected in times of economic hardship is public investment, but what's currently taking its toll is public investment in science, especially in curiosity-driven science and exploration.

I want to convince you in 15 minutes how absurd that is.

To give you an idea of ​​what's going on, I have a slide I'd like to show you, but it's probably the first slide I've seen at TED that looks this bad.

(Laughter) Actually, it's a drawing I borrowed from The Guardian.

It's a nice depiction of the cost of science.

To explain why we should invest in curious science and exploration, I thought I should tell you how much it would cost.

What is the cost of science

This is the amount spent by the UK government

about £620 billion a year

The money spent on science is the purple and yellow circles on the left,

One of the little yellow circles is the cost of science.

About £3.3 billion a year out of £620 billion.

fund all things uk

Medical research, space exploration, particle physics research in Cern, where I work, engineering, and even the humanities, all fall within the scientific budget, which is £3.3 billion, which you can see in the upper left corner of the screen, as the yellow circle next to the orange circle.

this is what we discuss

By the way, the percentage is about the same as in the United States and Germany and France.

Publicly funded - development research is about 0.6% of GDP.

this is what we discuss

First of all, I'd like to say that if you watch any of the documentaries I've been on, I've seen the incredible beauty of exploring the solar system and the universe.

This image was sent by Cassini from near Saturn, after we taped the show.

not included in the program

this is Enceladus

The big white sphere on the left is Saturn.

The crescent moon is Enceladus, about the size of the British Isles.

Diameter is about 500km

a small satellite

in this photo

It's not edited, it's a black-and-white photograph straight from Saturn's orbit.

The beauty of this photo is the streaks of smoke faintly visible from the rim.

The documentary shows it like this

it's a beautiful image

These streaks of smoke are actually ice erupting from the surface of a small moon.

It's a beautiful sight in itself, but it's believed that liquid water beneath Enceladus is what drives this ice to erupt.

And what's amazing about it is that on Earth, wherever there's liquid water, there's life.

So it's amazing to have strong evidence that there's liquid under the surface of a satellite that's 1.2 billion kilometers from Earth.

That means it could be a habitable environment for life in our solar system.

This one is CG, so one more

I'll show you Enceladus

This is a picture of Cassini as it passed below.

It slowly flew hundreds of kilometers above Enceladus.

This is also a real picture of the ice erupting, and it's breathtakingly beautiful.

The most likely candidate for life in the solar system is

Probably Jupiter's moon, I would say Europa.

We flew up to the Jupiter system to make sure this moon wasn't just a stone.

Europa is an icy satellite

You can only see the surface on your screen, but the ice is probably hundreds of kilometers thick.

By measuring how Europa interacts with Jupiter's magnetic field, and by imaging the ice cracks moving, we speculate that Europa's entire surface is covered by a liquid ocean.

Underneath the ice is a liquid ocean that covers the entire moon.

believed to be hundreds of kilometers long

That liquid is salt water, which is believed to hold more water than all the oceans on Earth.

So Jupiter's tiny moon, Europa, is the most likely candidate for the discovery of life outside of the moons and Earth we know.

it's really a great find

Solar system exploration reveals the beauty of the solar system

It may also have helped answer the profound question of whether there is life beyond us in the universe.

In search and science, more than the pursuit of wonder

can be said to be meaningful

This is a very famous photograph, taken on my very first Christmas Eve, December 24, 1968, when I was eight months old.

Taken when Apollo 8 went to the far side of the Moon -

Earth rising from the moon

It's a famous photo that many say saved 1968. It was a tense year, with the May Revolution in Paris and the height of the Vietnam War.

The reason so many people talk about this photo is because Al Gore has said it many times at TED, probably because this photo was the beginning of the environmental movement.

Because for the first time we saw the Earth, it wasn't a solid, immovable place, but a very small and fragile figure floating in the darkness of space.

Also, although it's not often mentioned, the space exploration of the Apollo program made a huge contribution to the economy.

You could argue that space exploration was a great achievement, and that it was great to get a picture like this, but it also cost a lot of money.

In fact, a lot of research has been done around the economic effects of Apollo.

The largest study was done in 1975

For every dollar spent on the Apollo, 14 dollars returned to the U.S. economy.

So the Apollo program was 14 times more profitable in terms of inspiration, engineering progress, and inspiring young scientists and engineers.

Exploration pays off

Driving scientific discovery and innovation

let's look at it from an angle

It doesn't seem to make any sense—

This picture is the spectrum of hydrogen.

In the 1880s and 1890s, many scientists and observers observed the light emitted by atoms.

I got this weird picture

As you can see through a prism, heated hydrogen doesn't just glow white, it emits a specific color: red, light blue, dark blue.

This leads to an explanation of the structure of an atom, which has a nucleus in the center and electrons circling around it.

The places where electrons can exist are limited

As it moves into a nearby orbit and returns to its original orbit, it emits a specific color of light.

So when atoms are heated, they emit distinct colors of light, which was one of the driving factors that led to the development of quantum theory to explain atomic structure.

this is a remarkable photo

the spectrum of the sun

Here's a picture of an atom in the atmosphere around the sun, absorbing light.

Again, when the electron's orbit changes, it absorbs a certain color of light.

Look at the number of black lines in the spectrum

The element helium was discovered just by looking at the light of the sun, because black lines like this represent unknown elements.

That's where the name helium came from.

Named after the sun god Helios

It sounded esoteric, but it was an esoteric investigation, but quantum theory quickly revealed the properties of electrons in materials, such as silicon.

Because you can make transistors, silicon behaves perfectly according to quantum theory.

So if we didn't let our curiosity lead us to understand the structure of the atom, we wouldn't have quantum mechanics, we wouldn't have the transistor, we wouldn't have the silicon chip, we wouldn't have the foundations that support our modern economy.

There is another surprising twist to this story.

In our shows, we kept stressing that the laws of physics are universal.

One of the great things about physics is that once we understand the properties of things on Earth, we can apply them not just to other planets, but to the most distant stars and galaxies.

One of the astonishing predictions of quantum mechanics that can be gleaned from just looking at the structure of an atom -- the same theory that explains the transistor -- is that no star with a mass greater than 1.4 times the mass of our sun has lived its entire life.

This is the limit imposed on the mass of stars.

If you look at the sky with a telescope, you can see that there are no dead stars with masses greater than 1.4 times the mass of the Sun.

very surprising prediction

If there was a star with that mass

I see something like this

This is a picture of a galaxy similar to the Milky Way, with a trillion stars like our Sun.

One of the billions of galaxies in the universe

There are billions of stars in the galactic core, which is why it shines so brightly.

This is about 50 million light years away - one of our nearest galaxies.

But the bright star there is a star that belongs to that galaxy.

That star is 50 million light years away.

Part of that galaxy that contains billions of suns and shines like it's the center of the galaxy.

Type 1a supernova explosion

This is an amazing phenomenon that exists

A dwarf star made up of carbon and oxygen

Mass is about 1.3 times that of the Sun

There are orbiting binary stars, big gas stars.

It sucks the gas out of that binary and explodes when the Chandrasekhar limit is reached.

A billion times brighter than the sun, it shines for about two weeks, releasing vast amounts of energy and chemical elements into space.

It's a dwarf star made up of carbon and oxygen.

When the big bang happened, there was no carbon or oxygen in the universe.

The first generation stars didn't have carbon and oxygen.

Carbon and oxygen were produced in stars, and from their condensed states, these explosions sent them back into space, forming planets, stars, new solar systems, and humans.

And I think it's a beautiful testament to the power, to the virtues, to the universality of the laws of physics, because on Earth we can understand the structure of atoms, we can understand the supernova process.

In the words of Alexander Fleming, "When I woke up at dawn on September 28, 1928, I had no intention of revolutionizing all medicine by discovering the world's first antibiotic."

Those who pursued the atomic world had no intention of inventing the transistor.

Of course, they didn't set out to explain how supernova explosions work, but they ended up explaining the origin of life in the universe.

So I think it's important to make discoveries by chance.

Beauty and the most amazing things can come out of it

And I think it's going to tell us what the most meaningful thing about the earth in the universe is, what is the value of the earth.

This picture of the Earth is awe-inspiring

what looks like saturn

It's because Saturn

Taken by Cassini

This picture is famous not because of the beautiful and majestic rings of Saturn, but because beyond the rings you can see little dots of faint light.

You can see it if you pull it out.

This looks like a satellite, but it's a picture of the Earth.

Earth in a Saturn photo

Earth taken from 1.2 billion km away

Strangely enough, the further away you are from the Earth, the more beautiful it seems.

But I captured the Earth from the furthest point—

The most famous photo was taken by Voyager.

I'm standing in front so you can see the size

Voyager is a small probe

It's now 16 billion kilometers from Earth, sending out signals at 20 watts of power and still communicating.

Jupiter, Saturn, and Uranus - reaching Neptune

After observing these four planets, Carl Sagan, who I admire, came up with the wonderful idea of ​​turning the Voyager around and taking pictures of the places it visited.

and took pictures of this earth

It's called a "faint blue dot," but you can see the Earth superimposed on the streak of light.

Earth as seen from a distance of 6.4 billion km

Here are Sagan's words: I can't think of anything more beautiful to describe the pictures he took.

“Think this point over again.

it's here it's home it's us

Here's someone I love People I've heard of People who've lived all their lives Where they've all lived

Joys, sorrows, countless religions, ideologies and economists, hunters and gatherers, heroes and cowards, creators and destroyers of culture, kings and peasants, loving lovers, mothers and fathers, hopeful children, inventors, explorers, moral teachers, corrupt politicians, superstars, leading leaders, the greatest saints and sinners of all time lived in the dust of the sun.

Astronomy is a humble and character-building experience.

The only thing that teaches us the foolishness of our pride is a photograph of this small world taken from afar - maybe nothing but a photograph.

It is our responsibility to take care of this blue dot, the one and only home where humans come together in kindness to each other.”

It's a beautiful word to describe the power of science and exploration.

We will continue to hear people say that they know everything about the universe.

But even penicillin and transistors

It wouldn't have happened without research.

Even in today's difficult economic times

We don't need space exploration anymore-

there are people who say

Finally, let me quote a man I respect, Humphrey Davy, who was doing scientific research in the early 19th century.

he was always accused

The trends seen at the turn of the nineteenth century were

There was nothing other than development and use

He said, ``The view that science has run out, the view that it has been a great success, the view that the mysteries of nature have been discovered, the view that there is no new world to obtain, such thoughts are fatal to the progress of our minds.''

thank you

(applause)

Hello

Today I want to talk to you about music and machinery and life.

Specifically, what I learned in the process of building a large, complex device for a music video.

I think there are some people who look at this and get a pin

This is the opening of the video we made

I'm going to show you this video at the end, but before that, let me tell you a little bit about how this story started.

When we first met OK Go -- the song is called "This Too Shall Pass" -- we were pretty excited because they were interested in creating a device that we could dance with them.

I was very excited about this, because you know, they were already famous for dancing with machines.

This video "Here It Goes Again"

Viewed over 50 million times on YouTube

It's just a fixed-point camera filming the four of them dancing on a treadmill.

It's addictive and it's a great video

Our tension has risen.

First, discuss the direction they want

When I asked him what he wanted to do, he said he wanted to make something like a Rube Goldberg machine.

For those of you who don't know, the Rube Goldberg Machine is an intricate device, an incredibly well-designed mechanism that allows you to accomplish relatively simple tasks.

Getting excited about that idea and discussing how to make it

I've put together the essentials, Rube Goldberg machine, because there are limits to what you can build, but at the same time the options are endless.

It was also meant to see if we could render this as a music video.

Let's take a look at the 10 Commandments, starting with the easiest: First, don't use magic.

Everything that happens on screen should be easy for the average audience to understand.

So what my mother doesn't understand is that you can't use it for video.

2. Incorporating them into the device, not that they control the device, but that the device does something to them

3. The movement of the device should follow the feeling of the song

In other words, when the song gets really exciting, the movement of the device will also expand to match it.

4. Maximize space

What we used was a 100m square warehouse, but the floors were separated into the first and second floors.

There was also an entrance

There's also a huge hole in the floor, and I actually put a camera and a photographer down there to shoot.

5. She wanted to be "soaked", so I gladly accepted.

6. Make the device itself play the song

Turn on the device, move it some distance, and on the way play something from an iPod or a tape deck or whatever.

Keep the song and device in sync

Speaking of tuning, they said they wanted the machine to be in sync with the rhythm, but also to have a certain beat.

Okay (laughs) 8. Finish on time

In other words, no deviation in operation time is allowed.

But they also said they wanted to stop the music at a certain point and use the live sound of the device to play part of the song.

Still, is it still not enough? They say they want to shoot this complicated process with "one-shot shooting"

(Laughter) (Applause) Thank you.

So let's look back at this process with a few numbers.

This device consists of 89 different processes

I was able to get 85 takes on camera that I was reasonably happy with.

Of those 85 takes, only 3 were actually completed.

I think I broke two pianos and ten televisions

I visited the home center easily more than 100 times

(Laughter) I've lost one of my high heels. One of our engineers, Heather Knight, just got back from a fancy dinner -- she's going to start working on this device -- and she's left her high heels with a pile of tools.

Another engineer thought it could be used for something, and was used as a fancy trigger.

this actually shows up in the video

So what have we learned from this?

Now that we've built this device, we've looked at a few things a little objectively.

I found small things to be troublesome

Small balls on wooden grooves are very delicate, and affected by moisture, temperature, small dust, etc., they may fall out of the grooves, or they may not roll well unless they are set at a precise angle.

But any bowling ball is fine

No matter what the temperature is, no matter what's in your path, you'll generally go where you need to go.

Even if you say that small things are troublesome, it doesn't end if you don't start.

I have to focus on it anyway

Even if it's troublesome, it's also essential.

And nothing is more important than design.

(Laughter) Blueprints: A lot of shit, I spent a lot of time thinking about it, and I actually built some.

It is said that "any tactic is useless against the enemy in front of you."

The enemy before us was physics. (Laughter) That's pretty mean, too.

It wasn't easy to replace equipment for reasons like timing and aesthetics.

So design is important, but you also need flexibility.

These are all ideas that ended up being scrapped.

It's also important to bring something that's highly reliable to the end, so that it works reliably every time.

As they said, "small things are troublesome"

The Lego car that appears at the beginning becomes a real car at the end and reappears.

Big cars work fine every time.

Conversely, a small car may stray from the road, which is more difficult.

You don't want to start all over again just because your Lego flipped over at the end, right?

So if you bring something like that first, even if you make a mistake, you can try again.

sometimes life is tough

This time, we also fully experienced the severity.

I spent a few months in this cold, cramped warehouse,

When it comes to the amazing sense of accomplishment when it's all over,

The point is, whether it's good or bad, "This too will pass."

thank you very much

(Applause) So, thank you for waiting. Here's the music video in question. We're OK Go.

Hello everyone, this is OK Go.

What are you doing?

Just drinking around the Grammys

I think I can do a little better...

OK Go Have you ever spent a day reading this thick encyclopedia?

I mean, what is this... sorry sorry

let me do it again

Is there anything more obscure than an encyclopedia?

Tim's sundial hat!

New Waltz Tower Have you seen it yet?

sorry let's try again

(Wow-wow) You guys!

Hello everyone this is OK Go our new video "This Too Shall Pass"

(Shout) I still think I can do a little better

I'm glad now

(music) ♫ How long are you going to keep doing that? ♫ ♫ Hold me so tight ♫ ♫ But if you don't have anything to drag ♫ ♫ You better be ready to run for your life ♫ ♫ When the morning comes ♫ ♫ When the morning comes ♫ ♫ You want the kids to stop dancing ♫ ♫ What's the point? ♫ ♫ Even though I danced so hard ♫ ♫ No matter how stiff your head is and you can't even bend your knees ♫ ♫ Don't take eight out on the kids ♫ Don't worry about it ♫ ♫ This too will pass ♫ ♫ How long are you going to keep doing this? ♫ ♫ You can't stay depressed forever ♫ ♫ Don't be discouraged ♫ ♫ This too will pass ♫ ♫ When the morning comes ♫ ♫ When the morning comes ♫ ♫ When the morning comes ♫ ♫ When the morning comes ♫ (Applause)

Kamisa: We humans experience many decisive moments in our lives.

These moments are sometimes happy, sometimes heartbreaking, moments of tragedy.

But if we make the right choices in these decisive moments, we can literally create miracles for ourselves and others.

My only son, Tariq, was a college student. He was a sweet, empathetic writer. He was a good photographer. He wanted to work for National Geographic. He was engaged to a beautiful woman.

He was lured out by a young gang using a false delivery address.

Shot dead by a 14-year-old boy for allegedly joining a gang.

A sudden and meaningless death, the death of an innocent and defenseless human being, the grief of a devastating family, the undeniable delirium in the face of a loathsome new reality.

Needless to say, my life fell apart.

The hardest part was calling my mother who lived in a different town.

What should I say? "I can never see my son again" "I can't hear your laughter" "I can't hug you"

i am an islamic mystic

meditate for 2 hours a day

Sometimes deep trauma and tragedy are vividly remembered.

What I was thinking about in my meditations was "victims on both ends of the gun."

It's easy to think of my son as a victim, but it's hard to realize that a 14-year-old is a victim of American society.

So who is American society?

It's you and me. I don't think society is just a coincidence.

The society we created is everyone's responsibility.

Children killing children is not the way civil society works.

Nine months after Tariq passed away, we started the Tariq Khamisa Foundation, and our mission is to stop child-to-child murder by breaking the cycle of youth violence.

I also have three responsibilities.

The first and most important thing is to save children's lives.

It's important. Many lives are lost every day.

The second is to help children make the right choices so that they don't make mistakes and get involved in gangs, crime, drugs, alcohol and weapons.

The third is to teach nonviolence, empathy, compassion, the principle of forgiveness.

I also started with a very simple premise: violence is a learned behavior.

No child is born violent

Nonviolence can be a learned behavior if we take it for granted, but it has to be taught, because it doesn't come naturally.

Shortly after that, I contacted my "brothers" here with the attitude that they both lost their sons.

my son died

He too lost his grandson to the adult prison system.

I asked you to work with me

As you can see, 22 years later, we're still together. We can't bring Tariq back to life, we can't bring Tony (Press' grandson) out of prison, but the only thing we can do is make sure no more young people die or end up in prison in our neighborhoods.

With God's blessing, the Tariq Kamisa Foundation is doing well.

We created a "safe school" model that consisted of four programs.

The first is a meeting of the press and myself.

We're first introduced to this person's grandson, who killed this person's son, and is working with them.

There is also a curriculum in the classroom.

We also created an after-school mentoring program and a peace club.

And I'm happy to tell you that besides teaching the principles of nonviolence, we've reduced suspensions and expulsions by 70 percent, which is huge.

(Applause) That's great.

Five years after Tariq's death, for me, to complete my journey of forgiveness, I went to see the young man who killed my son.

i was 19

I remember meeting him, he's 37 and he's still in prison, because it was the first time we saw each other.

I looked him in the eye, he looked me in the eye - I looked him in the eye for a murderer, but he wasn't there.

When I looked into his eyes, I could feel his humanity no different than mine, just like everyone else here.

I didn't expect that, he regretted it.

Spoken clearly and behaved politely

I changed him by reaching out for forgiveness.

Now please welcome my brother Press.

(Applause) Press: Tony is the only child of an only daughter.

Tony was born to my daughter when she was 15.

Parenting is the hardest job in the world

There's no harder job than raising another human being, and helping them stay safe, protected, and on the rails of life's success.

From an early age, Tony experienced a lot of violence.

I witnessed one of my favorite cousins ​​die in a gang war in Los Angeles, beehived to death by an automatic rifle.

I was traumatized in many ways.

tony came to me

I wanted to do everything I could to help Tony lead a decent life.

But that night, after years of spending time with me, years of struggling to succeed, years of trying to live up to my expectations, that night alone, Tony ran out of the house, went to his friends, was given drugs and alcohol, and used them, and he thought it would take him out of his worries.

But these are even more disturbing, more...

gave birth to a deadly thought

He was invited to a robbery with a 9mm pistol.

And in front of his boss, an 18-year-old boy, and two 14-year-old boys who he thought were his friends, he shot and killed Tariq Kamisa, this man's son.

The death of a child cannot be described in words.

When I learned that my grandson was involved in a murder, I went into the prayer room and began to pray and meditate, just as my predecessor had taught me.

One thing that Mr. Kamisa and I had in common, which we didn't know, was that besides being a wonderful human being, we also meditated.

(Laughter) It's been a huge help, because it's given me the opportunity to follow the path to support the bereaved Kamisa and her family.

Yes, my prayers were answered, because I was invited to a meeting in his home. I had the opportunity to meet his mother and father, and his wife, and brothers, and the people who were guided by him and inhabited by the Spirit of God.

Some of the Tariq Kamisa Foundation's programs are to give children a wealth of tools that they can keep with them throughout their lives.

While it's important for our children to understand the care and support from adults who love and care for them, it's also important for our children to learn to meditate, to be calm, to be focused, to be with other children, in a kind, empathetic, wonderfully loving way.

Society needs more love, and we are here to share it with our children, because they guide us, and we will all depend on them in the future.

When we're old and retired, they're the heroes of society, and if we teach love, they'll come back.

thank you for god bless you

(Applause) Kamisa: I was born in Kenya and studied in England. My brother is a Baptist.

i am an islamic mystic

He's African-American, but he always says, I'm African-American.

I was born in Africa but you weren't

(Laughter) I became a naturalized citizen.

I am a first generation citizen

I thought, as an American citizen, I must share responsibility for my son's death.

why? Because I was shot by an American child.

Even if you thought you should hang yourself from the tallest tree because you killed my only son.

Will it make society better?

I'm sure you're wondering what that young man is doing now.

He's still in prison, he turned 37 on September 22nd, but there's good news.

I spent 12 years trying to get him back.

This time next year, you will finally join our activities.

(Applause) I'm so happy to have him because I know we saved him, but if he were to testify at the schools we usually visit, he would save tens of thousands of students.

He told his children, "When I was 11, I joined a gang.

When I was 14, I killed Mr. Kamisa's son.

spent years in prison

I want to tell you, it's not worth it.' Will the children listen?

Of course, because his words are the words of the human who pulled the trigger.

I'm sure you want to turn the hands of the clock back.

Of course that's not possible

I want my son to live, too.

I want my brothers and grandchildren to come back.

I feel that this experience illustrates the power of forgiveness.

What is the lesson for today?

I would like to end this talk with a quote from my fourth book, by the way, the introduction was written by Tony.

It is said: “Long goodwill breeds friendship.”

You can't make friends with the bombing.

make friends by spreading goodwill

it should be self-explanatory

Long-term goodwill breeds friendship Long-term friendship breeds trust Long-term trust breeds empathy Long-term empathy breeds compassion Long-term compassion breeds peace

I call it the peace formula

It begins with good intentions, friendship, trust, empathy, caring, and finally comes peace.

But people ask me, "How can you show goodwill to the person who killed your child?"

I say forgiveness expands

i am a living witness

my family too

The miracle was that it resonated with Tony, and his family, so you and your family can do it, Israel and Palestine, North and South Korea, Iraq, Afghanistan, Iran, Syria, and so on.

United States too

And finally, to all the women here, and to a few men out there, (Laughter) peace is possible.

how did you know ―

because i feel at peace now

thank you very much namaste

(applause)

What the world needs, what this country definitely needs, is a better way to have a political debate.

We must rediscover the art of democratic debate that we once had.

(Applause) When you think of current debates, you probably just think of cable TV scenes of yelling, or ideological debates in Congress.

I would like to suggest one

Think back to recent discussions about health insurance, financial district bonuses and bailouts, wealth inequality, affirmative action, or same-sex marriage.

Beneath the surface of these debates lies the big question of moral philosophy, or the big question of justice, that everyone gets emotional about.

But we rarely discuss, articulate, or defend against the big questions of moral philosophy in politics.

So today I would like to discuss

First of all, let me take a famous philosopher who wrote about these issues of justice and morality.I would like to introduce you to the ancient Greek Aristotle.After presenting his logic about justice, let's have a discussion and see if Aristotle's ideas are useful in considering and discussing today's problems.

I'm going to start the lecture, okay?

According to Aristotle, justice is giving people what they deserve.

yes this is the lecture

(Laughter) It's a no-brainer.

The real problem starts with debating who deserves what and why.

Take the flute for example

Distributing flutes

Who Should Get the Best Flute?

I want to hear your opinion.

Who should get the best flute?

I don't mind speaking on the spot

(Audience: Random) Sandel: Random, so it's a lottery.

Or whoever jumps into the hall first gets it

Other than that?

(Audience: Who is the best flute player) Sandel: Who is the best?

Who do you think is the best?

Reason?

Yes, that is Aristotle's answer.

(Laughter) But the harder problem is

Why did the person who just raised his hand think that the best flute should get the best flute?

Peter: Because it maximizes the overall profit

Sandel: Maximizing Overall Profit

If a good person gets the best flute, he should be able to hear good music.

Is your name peter? (Audience: Peter) Sandel: Good.

good explanation

Listening to beautiful music makes me happier than listening to terrible music

But Peter Aristotle disagrees with your explanation.

That's it

Aristotle explains differently Why the best players should have the best flutes

Aristotle says the flute exists because it can be played well.

Aristotle said that in order to logically explain the distribution of things, it is necessary to logically explain and discuss the purpose of the existence of things or the purpose of social activities.Here, performance is the purpose.

The point is, the essence of playing is to create good music.

Even if we benefit from it, it's just a by-product of chance.

When we think about justice, according to Aristotle, what we really have to think about is the nature of the activity in question, the nature of being praised, glorified, valued.

One of the reasons why the best flute players should get the best flutes is not only because their playing makes us happy, but to appreciate and celebrate the excellence of the best players.

The question of who to give the flute to seems like a trivial matter.

Now let's turn to contemporary issues in the debate about justice.

It's a matter of golf

Do you know Casey Martin a few years ago?

He was an elite golfer, but he had a disability.

I had a problem with my legs due to a circulatory problem, which made it very difficult for me to walk the course.

There was a risk of injury

Asked the PGA Professional Golf Association to allow carts in PGA tournaments

the answer is no

The reason is that it gives an unfair advantage.

He went to court, and believe it or not, it made it all the way to the Supreme Court, even though it was just Kurt's problem.

He said, "I'm a top golfer and

want to participate in the competition

I just need a cart to move from hall to hall."

Imagine you were a Supreme Court Justice.

Consider that we have to decide what justice should be in this case.

How many people think Casey-Martin has the right to use Kurt?

Or what if you think you have no rights?

Let's vote now Raise your hand

Who agrees with Casey Martin?

So who is against him?

Opinions were divided quite well

Can anyone explain why Casey-Martin doesn't approve of using Kurt?

I'll put my hand up and pass the mic

What is the reason?

(Audience member: Because it's an unfair advantage.) Sandel: Riding a cart is an unfair advantage.

I think most people who disapprove of using carts are concerned about this unfair advantage.

What about the opinion of those who say carts should be allowed?

What objections would there be?

please

Audience: Karting is not part of golf

Sandel: What's your name? (Audience: It's Charlie.) Sandel: Charlie, someone might object, so give Charlie the mic.

So Charlie, why should we allow carts?

Charlie: Because karting is not part of golf.

Sandel: What about walking from hall to hall?

Charlie: I don't think it matters. It's not part of golf.

Sandel: Isn't walking the course part of golf?

Charlie: I don't think it's part

Sandel: Alright, Charlie, keep it up.

(Laughter) Any objections to Charlie?

Who wants to argue with Charlie?

give me your opinion

Audience member: I think endurance is also a very important part of golf, as is walking between holes.

Sandel: I can walk all the halls

Is it part of golf? (Audience: Yes) Sandel: What's your name? (Audience: Warren) Sandel: Warren.

What do you think of Charlie Warren's opinion?

Charlie: I don't change my mind

(laughs) Sandel: Warren, do you play golf?

Warren: No

Charlie: I would. (Sandel: I guess) (Laughter) (Applause) You know, it's interesting.

A prominent golfer was called to testify at a lower court hearing.

Is walking the course the essence of golf?

Jack Nicholas and Arnold Palmer were called

what did they say?

That's right, I agree with Warren.

In other words, walking the course is strenuous exercise.

Fatigue is also an important part of golf

That's why it was the opinion that the use of carts would fundamentally change the game of golf.

There's one interesting thing here, but first let's talk about the Supreme Court.

the supreme court ruled

what was the verdict?

The verdict was that Casey-Martin should be allowed to use the cart.

The verdict was 7 to 2

What's interesting is that both the Supreme Court's ruling and the discussion we've had here are based on what the essential elements of golf are and what's right and what's right in this case.

And a Supreme Court justice has tackled the issue head-on.

In the opinion of the majority, Justice Stevens has written extensively on the history of golf, stating that the essential element of golf is the movement of a very small ball from one position to the hole in a few strokes, and that walking is an incidental element rather than an essential element.

There were two objections, but one was Judge Scalia.

He denies the use of carts and makes an interesting counter-argument.

What makes his opinion interesting is that it denies the Aristotelian premise that underlies the majority opinion.

He says you can't determine the essential elements of a sport like golf.

let's quote him

"Something is essential usually means that it is essential to the attainment of the purpose of something.

But it's the nature of sport that it has no other purpose than recreation (Laughter), and that's what separates sport from productive activity (Laughter).

This is Justice Scalia's majority opinion, refuting the Aristotelian premise.

I have two questions about Justice Scalia's opinion.

That this is not what a true sports fan says

(Laughter) If you think that the rules of sports are arbitrarily determined, and that they don't exist to create the kind of virtues and excellences that we think are worthy of admiration, then we wouldn't be interested in the outcome of the game.

And from another point of view, this idea is questionable.

On the surface, the cart use debate looks like a fairness debate: what is an unfair advantage?

But if fairness is all that matters, there must be an easy and straightforward solution.

what would that be? (Audience: Everyone uses carts) Allow all players to use carts

Then there will be no question of fairness

But when everyone uses carts, perhaps even more unacceptable problems hang over the big name golfers and the PGA than when only Casey-Martin is allowed.

I wonder why?

Because the debate over cart use is not just about the nature of golf, it's about what kind of athleticism deserves to be admired and valued.

Let's keep the point as low as possible: golfers care about the status of the sport as a sport.

(Laughter) No running, no jumping, the ball is stationary.

(Laughter) If golf were a sport you could play in a cart, wouldn't it be difficult to show a famous golfer the admiration and recognition that we show to other truly great athletes?

In golf, as in the flute, it is no easy task to answer the question of what justice requires unless we have a good grasp of the question: What is the nature of the activity in question?

Let's move on to the last example. Let's talk about same-sex marriage, which is a big issue in modern political debate.

Some people think that only traditional marriage, that is, marriage between a man and a woman, should be allowed by the government, while others think that same-sex marriage should also be allowed.

How many people would choose the first policy? Who thinks that only traditional marriages should be allowed?

So the second policy, who stands for same-sex marriage?

So let me put it this way: What ideas about justice and morality are we basing our arguments on marriage?

Opponents of same-sex marriage say that the purpose of marriage is fundamentally to reproduce, and that's what makes marriage great, valued and encouraged.

Same-sex marriage advocates, on the other hand, deny it Procreation is not the only purpose of marriage What about lifelong, mutual, loving commitment?

Isn't that what marriage is about?

So Aristotle is pointing out the flute, the golf cart, and even very difficult issues like same-sex marriage.

A discussion of justice cannot take place until after there has been a full discussion of the nature of the purposes and activities of social institutions which deserve praise and appreciation.

Let's step away from individual cases and think about how these issues can help improve and enhance the content and quality of political discourse in the United States.The same is true in the world.

We tend to think that addressing moral issues in politics too directly creates discord and creates intolerance and oppression.

So I think it's better to dodge or ignore the moral and religious beliefs that are brought into our daily lives.

But I believe that the discussion so far leads to the opposite conclusion: that in order to become more mutually respectable, we should confront the moral beliefs that people bring into social life, and not ask people to put their deep moral beliefs aside from politics.

I think this is the way to revive the art of democratic debate.

thank you

(Applause) Thank you.

(Applause) Thank you.

(Applause) Thank you.

Thank you thank you

Chris

thank you chris

Chris Anderson: You've done a great job of making the connections from the flute to golf to the issue of same-sex marriage.

you are a pioneer in public education

Starting with that wonderful lecture series

What do you see next?

Sandel: I have something I want to try.

Students' fiercely contested moral beliefs on public issues become the subject of our discussion in the classroom.

I want to extend this to all aspects of life in general.

So, my dream is to create a public TV series, like my lecture series that is available online, and make it available to the public for free around the world, with a view to partnering with educational institutions and universities around the world, in China, India, Africa, to improve civic education and create a luxury version of the democratic debate.

Chris: So you're saying that eventually you'd like to have people from China and India participate in live, real-time discussions and questions like this?

Sandel: Yes, again, we had 1,500 attendees in Long Beach, and about 1,000 students in our classrooms at Harvard.

Wouldn't it be interesting to take very big moral and persuasive issues seriously, think and debate, explore cultural differences, and use live television to connect students in Beijing and Mumbai and Cambridge and Massachusetts to create a global classroom?

that's my dream

(Applause) Chris: I think a lot of people would agree with you.

Sandel: Thank you (Sandel: Thank you)

Like robots and humans, you can only make a first impression once.

The first time I encountered a robot like this was in 2008 at a place called Willow Garage.

As I was led into the building by the receptionist, I came across this little object.

He was moving down the hallway, but as he approached me, he stopped there and stared blankly at me.

not a very good first impression

What I learned about robots that day was that they were capable of some degree of autonomy, but they could not perceive humans at all.

I think that in the end, there's more to be learned about humans than about robots themselves, as we experiment with the robots of the future.

I had pretty high hopes for this little machine that day.

I thought he could handle not only autonomous movement in the physical world, but also my sociality, a personal robot that walks into my space.

How can you not understand me?

The person in charge explained to me, "So the robot got stuck on the way from point A to point B, and you got in the way, so it rethought its path, figured out which way to go, and chose another path." That's not very efficient.

If the robot finds itself that I'm a person, not a chair, willing to give way to a robot heading somewhere, then an efficient way to accomplish that task is to deliberately recognize that I'm a human and treat it differently than a chair or a wall.

We tend to think of robots as coming from outer space, the future, science fiction, and so on.

These two robots are at my house

I vacuum and mow the lawn every day, even if I have time, I don't do that much and I do better than I do.

This robot takes care of kittens

Every time my kitten uses the litter box, I clean it, and that's not something I enjoy doing, so it's improving not only my kitten, but my life.

These robot vacuums, robotic lawn mowers, robotic cat litter boxes, and many other robots go unnoticed.

given a new name

The reason they aren't called robots is because they're useful in our lives.

So is the automatic temperature controller.

If I call it a robot, the person in that lineage will probably give you a bad look, but it's a device with a purpose.

I'm measuring the world around me with the goal of keeping my house at 19 degrees.

When the temperature cools down a little bit, we make a plan and work with the physical world.

It's just robotics

Even though it doesn't look like Rosie the Robot, it's been very useful in my life, because I don't have to bother with turning the room temperature up and down myself.

Systems like this are now part of our lives. Not only are these systems ingrained in our lives, but you're probably also piloting robots.

It's kind of like when you're driving a car, you're controlling a machine.

You're just trying to get from point A to point B, but your car is equipped with power steering, self-braking automatics, and adaptive cruise control systems.

It may not be a fully autonomous car, but it does have some degree of autonomy, which is very useful. It's a feature that makes driving safer.

When you drive a car, all you have to think about is going to another place.

The reason it doesn't feel like a daunting task of self-judgment and control is because you've learned how to drive over a long period of time to the point where you feel like an extension of yourself.

You know where the edge of the car is when you're parking in a tight, confined space in your garage.

When you rent a car, if it's your first time driving, it will take some time to get used to the new robot.

The same is true for people who operate other kinds of robots, and I want to talk a little bit about that.

The first is how to handle the challenge of remote collaboration.

At Willow Garage, I have a colleague named Dallas, and he's like this.

The company is in California, but he works from his home in Indiana.

It's generally fine for him to join the meeting on the audio device on the tabletop, but if the discussion gets too heated and he doesn't like what Dallas said, he'll hang up in the middle. (Laughter)

Or when you're in a recurring meeting, the decisions are actually made later in the hallway, but Dallas isn't there.

not funny for him

Our company has a few leftover robot parts, and Dallas and his friend Kurt put the parts together and put a skype screen and wheels on a stick.

And since then, if I don't respond to an email from Dallas, he literally rolls into my office, stands in the doorway, and keeps asking for an answer (Laughter) until I do.

You can't turn off the power. Excuse me.

It can be used not only for this kind of one-on-one communication, but also for participating in all-hands meetings.

So being able to visibly participate in all-hands meetings and show your contribution to a project while sitting in your home office is very important and makes remote collaboration more efficient.

Remote participation continued for months and years, and we started seeing it in other companies.

The biggest advantage of a system like this is that you start to feel like you're sharing the same space.

It's the person -- the person's body, and the space becomes available for the person.

In a standup meeting, participants gather around the robot as if the person were there.

Not only good things, but also bad things

People who meet this robot for the first time say, "Wow! What's going on here? There must be a camera here," and they start poking it in the face.

"You're too quiet, let's turn the volume up." This is like a colleague walking up to you and saying, "You're too quiet. Turn your head up."

This is bad, so we had to create new social norms around these systems.

Also, as soon as the person begins to feel the robot as their own body, they realize, "Oh, the robot version of me is short."

Dallas told me that too, because he was 180 cm, so when you take him to a cocktail party via a robot, he looks like this.

Dallas said, "Looks like people aren't looking at me.

I can only see shoulders and rows of shoulders.I want a tall robot."

But my answer was, "No, I don't need it.

You know where I stand today

I'm just looking at it from the perspective of short people."

And through that experience, he's also learned to care, which is a blessing.

When Dallas himself came to the office, he no longer looked down at me, but sat in his chair and looked me in the eye.

So we decided to experiment with things like the height of the robot to see what difference it made.

In our study, half of the people used a short robot, half used a tall robot, and we found that when the same person projected the same body on a screen and said the same thing to someone else, the taller robot was more persuasive and more trustworthy.

You can't make a rational sense of it, but that's why we have psychology.

Professor Cliff Nass would have put it this way: we have to deal with these new technologies with old, old brains.

Human psychology doesn't change as fast as technology, but there's a lot more that we need to keep up with in order to truly understand the world of autonomous machines roaming about.

Most people talk, machines don't

They attach so much meaning to the height of just the machine, not the person, and then apply that meaning to the users of the system.

When thinking about robotics, it's important to

Instead of thinking about reinventing humans, shouldn't we try to see how far we humans can go?

In the end, while using these things, something surprising happened.

This robot doesn't have arms, so it can't play pool, but it can taunt a pool player, which is important for team cohesion, which is great.

People who are good at operating robot systems have come up with new ways to play, such as pushing trash cans in the middle of the night and playing robot soccer.

But not everyone is good at manipulating

Many people have trouble operating the system.

One person logged into the robot, and his field of vision was shifted 90 degrees to the left.

I didn't realize it, and every time I moved, I bumped into people's desks, and I was very embarrassed.

So the person on this screen said, "Let's put a mute button on the robot."

In other words, it is a function to not disturb the people around you.

As a robotics company, we built obstacle avoidance into the system.

So we put in a laser ranging system so that we could see obstacles. So, for example, if I'm piloting a robot and it almost hits a chair, the robot will avoid the collision and find a way around it. Sounds like a good idea.

Obviously, with this system, you don't run into obstacles, but on the other hand, some people took much longer to get through the obstacle course, and I looked into why.

It has to do with an important aspect of human beings, the personality aspect known as the locus of control. People with strong internal control try to get to their destination on their own.

They're going to have a tougher time with the help of autonomous systems, and it's important to know that we're in an age where we're trying to build cars and things with even greater autonomy.

How do diverse people deal with the challenge of delegating control?

Depends on the human side of each

we can't treat humans like monoliths

Because people have different personalities, different cultures, different emotional states, and designing a system like this -- an HRI system -- you have to consider not only the technical side, but also the human side.

Along with a sense of control comes a sense of responsibility.

Here's the interface for operating a robot using this control system.

It has the advantage that it's almost like a video game, and it's familiar to everyone, but it has the disadvantage that it can be mistaken for a video game.

At Stanford University, there are a bunch of students who operate the system, and they're driving robots around their offices in Menlo Park, and they're saying things like, "Ten points if you hit that guy over there, 20 points if you hit him."

and chase people down the hallway

(Laughter) I was like, 'Well, those people are real people.

If you hit me, I think you'll bleed and hurt."

I will give you a satisfactory answer.

After five minutes, he says, "If you hit that guy over there, you'll want him to hit you with 20 points."

It's like ender's game

The other side is the real world, and as designers of these interfaces, I think we need to encourage users to understand that their actions have real consequences, and that they take responsibility as they navigate increasingly autonomous machines.

So far, I think it's a great example of an experiment to imagine what the future might look like with robots. It's wonderful that we can expand ourselves, that we can learn how to do this with machines like this, and at the same time be able to express our humanity and our individuality.

It's also nice to learn to empathize with other people's situations, such as "short," "tall," "fast," "slow," and "no arms."

We humans also empathize with the robot itself.

this is my favorite robot

called a tweenbot

This robot has a little flag on it that says, "I want to go to the crossroads in Manhattan."

This robot doesn't know how to build maps, it doesn't know how to perceive the world, so it needs people's help.

In fact, even robots can rely on the goodwill of strangers.

I was able to cross the park and get to the other side of Manhattan - that's amazing - thanks to all the people who put it in the right direction.

(laughs) Isn't that amazing?

We're trying to create a society where humans and robots can co-exist and cooperate with each other, without needing to be completely autonomous or do things alone.

Humans and robots work together

It takes artists, designers, policy makers, legal scholars, psychologists, sociologists, and anthropologists to do what Stuart Card said we need to do -- to build the world we want, we need to bring together more diverse perspectives.

As we continue to work together on research into the future of various robots, we will be able to gain a deeper understanding of ourselves.

thank you

(applause)

The Philippines—an idyllic country with the cleanest water on earth and the bluest sky.

The country is also at the center of one of the world's fastest growing HIV infections.

On the surface, it appears that the epidemic was just slow to spread.

The reasons for the current epidemic are much more complex and may be a precursor to a global HIV resurgence.

Globally, the total number of new HIV cases continues to fall, but this trend may be temporary until more aggressive resistant viruses emerge.

HIV can transform into a new, altered virus each time it infects a cell.

In spite of all the impressive progress we've made in stopping epidemics, the truth is that a virus that mutates a few times can be catastrophic.

To understand the ingenuity of how HIV transforms every time it replicates, let's compare genes.

If you look at DNA diversity among different races from different continents, the actual DNA variation is only 0.1%.

If you look at the genetic variation between humans, apes and rhesus monkeys, it's 7%.

In contrast, the genetic variation in HIV subtypes from different patients is as high as 35%.

In a single HIV-infected person, the genetic variation between the infected parent virus and its subsequent offspring is said to be up to 5%.

It's like a gorilla giving birth to a chimpanzee, orangutan, and baboon, giving birth to random ape offspring in their lifetime.

There are nearly 100 subtypes of HIV, and new subtypes are discovered regularly.

HIV in developed countries is mostly one subtype - subtype B.

Much of what we know and do about HIV treatment is based on studies of subtype B, even though it accounts for only 12 percent of HIV cases worldwide.

But the large genetic differences between the various subtypes make them more susceptible to drug resistance and more likely to develop AIDS earlier.

We found that the explosion of HIV cases in the Philippines was due to a shift from the Western subtype B to the more aggressive Southeast Asian subtype AE.

We encounter younger, more severely ill patients with higher rates of drug resistance.

Invasions of this subtype have already begun in developed countries such as Australia, Canada, and the United States.

We may see similar explosions in these countries in the near future.

Even when you think HIV is over, or you feel like things are getting better, it can come back, like a real tide.

In the early 1960s, malaria was on the verge of extinction.

As the number of cases decreased, people and governments began to pay less attention.

The result is the re-emergence of deadly drug-resistant malaria.

We shouldn't think of HIV as just one virus that we've figured out. Instead, we should think of it as a group of rapidly evolving and fairly unique viruses, each of which could trigger the next deadly epidemic.

We're developing new, more powerful tools to help find the next deadly strain of HIV, which will require collaboration with urgent research into the nature of non-B subtypes and appropriate treatments.

We need to convince governments and research funding agencies that HIV is not over yet.

More than 35 million people have died from HIV so far.

We're on the verge of becoming an AIDS-free generation.

must pay attention

We need to be constantly vigilant and keep track

Otherwise millions more will die.

Thank you for your attention

(applause)

I have to say it's pretty presumptuous to be on this stage, for an old American to talk to an African about new discoveries on the African continent.

But sometimes foreigners can see things differently, like looking down from the sky.

And that's what I've learned from my slow, low-flying flight over the continent of Africa, photographing spectacular, diverse landscapes.

I used to be young

(Laughter) This is me in 1979, a Californian backpacking through the Ituri Forest in Zaire.

I was in the middle of a year-long hitchhiking trip.

Right after I dropped out of Stanford University, I went from Tunis to Kisangani to Cairo and learned how to live on $10 a day.

it was a great experience for me

I spent about a week in a Dinka cattle herder's camp on the banks of the Nile River in South Sudan.

I was taught by the Dinka how to tie papyrus to make a home, and I observed closely how the Dinka people adapted their lifestyle around their precious cattle, which needed nomadism.

Like a master's degree in ecoethnology, I took notes with my camera in hand.

They don't have a ticket, so they often travel on the roofs of white freight cars or freight trains like this across South Sudan.

I felt like I was riding on the back of an insect across the vast tapestry of Africa.

The view from there was amazing, but I couldn't help but think, if I could fly like a bird, this view would be even more amazing.

I stuck with that idea, and 20 years later, when I became a professional photographer, I won over National Geographic, and after a major expedition in the central Sahara, I'm back with a new kind of flying machine.

This is me flying the world's lightest, slowest aircraft.

(Laughter) It's called a motor paraglider.

It has a backpack motor and parachute wings, and it flies at about 50 kilometers per hour.

On 10 liters of fuel, you can fly for about two hours, but what's really amazing is that you have an unobstructed view, both horizontally and vertically, like a flying deck chair.

My hitchhiker's dream of flying over Africa came true when I saw two camel caravans passing through the middle of the Sahara desert.

The caravan in the foreground is carrying salt out of the desert, and in the background is the caravan carrying camel fodder back to the desert.

I realized that this kind of photograph was unlikely to be captured on a conventional airplane.

Airplanes move too fast, helicopters get too noisy with too much downdraft, and it occurred to me that this little, quirky flying device I was on would open up new avenues for seeing the African outback landscapes in ways that weren't possible before.

let me show you how it flies

(Applause) Thank you.

(Applause) It may seem a little dangerous, but I'm not an adventurer.

I'm a flying photographer, and I fly only for photography.

My favorite altitude is between 60 and 150 meters, because at that altitude, you can see the world in three dimensions and in physical scale.

A lot of what I've done over the years in Africa, you could do with a drone, but drones aren't really built for exploration.

Flight time is about 20 minutes on battery power, and at most 3 square kilometers, you can only see what you see on the small screen.

but i want to explore

My hope is to discover beyond the horizon something new, something strange, like this volcanic caldera in Niger.

The altimeter on my left leg shows that I'm about a mile above the takeoff point.

Flying that high really freaked me out, but if you talk to any professional pilot, they'll tell you that altitude is actually your friend, because the higher you go, the more time you have to solve problems.

(Laughter) I was a total novice, and I thought it would just make me cry longer while I was crashing.

(Laughter) To calm myself down, I started filming, and in the process, I regained my composure, and this time I was caught in the Saharan monsoon, Harmattan, which was blowing in from the top right corner of this image, and I was beginning to see how the crater was filling up with sand.

When we got to northern Chad, we found a different kind of volcano.

These were stripped of all the surface, leaving only the old core, and in the middle of the Sahara, I felt like I was watching the earth being stripped of its raw skin.

There is a huge aquifer under the Sahara Desert.

When I go to the lake, sometimes I see the aquifer leaking out.

If you walk through that palm grove, you'll be able to drink the fresh water that seeps out of your footprints.

But what about this green lake water?

Evaporation is so intense that it's saltier than seawater and almost devoid of life.

In Niger, I was amazed to see how the locals learned to use the different springs in the desert.

Here, you mix salty mud with spring water, sprinkle it in a shallow pond, and as it evaporates, it creates a show of color.

My equipment is also great for watching agriculture.

This photo was taken in the south of Algeria, where locals have learned how to use shallow groundwater to grow vegetable gardens in moving sand dunes.

I also love watching animals adapt to the African landscape.

This photo was taken at Lake Amboseli, just across the border from Kenya.

Elephants carve through shallow lakes, creating a network of paths, well-spaced paths, and only elephants can use their long trunks to feed on the wettest grasses.

In Namibia, zebras have learned how to thrive in a dry environment.

The grasslands get their moisture from the dense coastal fog that blankets the area each morning.

Is that the area where nothing grows over there?

It's called a fairy circle, and even now, the scientific cause is still unknown.

This is Mount Bisoke, which is 3,700 meters high and has a small crater lake at its summit.

This mountain forms the ridge of the Great Rift Valley and is the border between Rwanda and Congo.

It's also the center of a legendary mountain gorilla sanctuary.

In fact, this is Rwanda's biggest source of revenue, and on this side of the border conservation efforts have been very successful.

Rwanda has the highest rural population density in Africa, and I found that in almost every region I visited.

Land disputes are said to have played a part in creating tensions that led to the genocide of the 1990s.

When I returned to South Sudan a few years ago, I was surprised to find that everything had changed.

The Dinka still treasured their cattle, but replaced their spears with Kalashnikov rifles.

The aerial view of the cattlemen's camp was more spectacular than I imagined, but even here, things have changed a lot.

See that little blue dot in the image?

The Dinka people are adapting to their new reality, and the tarp that now covers Papyrus's lair is a supply from a United Nations food convoy.

In Mali, the Bozos had learned to thrive in the pulsating rhythm of the Niger River.

When the rainy season ends and the water recedes, they plant rice in the fertile river bed.

The settlement on the bottom right is one of the starting points of Gao, a major trade route across the Sahara Desert.

At the end of the harvest season, the Bozo people take the leftover rice straw and mix it with mud to reinforce the roofs of their homes and the mosques of their villages.

I think I flew over about 10 villages along the Niger River like this, and each village is unique and has a different pattern.

And every mosque was like a masterpiece of sculpture, no two were alike.

I've flown all over the world, but what really stands out is the cultural diversity of Africa.

It's found in every country, from Morocco to Ethiopia to South Africa to Mozambique to South Sudan to Mali.

The diversity of the environment and the cultural adaptations to that environment is truly extraordinary, and its history is also very beautiful.

I capture the early waves of colonial history through the unique window of the sky.

This is Cyrene, a mountainous region on the Libyan coast, founded by the Greeks in 700 B.C. as a center of learning, and Timgard was founded by the Romans in 100 A.D. in what is now Algeria.

It was built as a retirement community for old Roman soldiers.It's amazing to think that North Africa was once the granary of the Roman Empire.

Timgard was buried in sand 700 years after it was built, but even then Africa was wetter than it is now.

Africa's weather continues to change, and we see it everywhere, like here in the Ziz Valley, where torrential downpours rushed in from the Sahara Desert and blanketed the mountains with snow.

I never thought I'd see a date palm in the snow, but the kids had a blast playing snowball fights that day.

But then I wondered how people in Africa are going to adapt to such rapidly changing weather in the future.

In a continent as dynamic and diverse as Africa, sometimes the only constant seems to be change.

But I've learned one thing: Africans are the ultimate improvisers, always adapting and finding ways to move forward.

thank you

(applause)

we are mistaken

everyone

we're misunderstanding

Cleaning up the ocean is something that should be done at the last minute.

it's the last

Yes, every hour, every minute of every day, a garbage truck full of plastic waste enters the ocean.

Countless birds and animals die just by encountering plastic.

Species extinction is happening at an unprecedented rate Plastic is entering the food chain

But I'm standing in front of you and telling you that cleaning up the oceans is a last minute need.

is the last

If you walk into the kitchen and the sink is overflowing, water is spilling all over the floor and water is seeping into the walls, you're going to have to react quickly. You're going to panic.

what to do first

why don't you turn off the faucet

Mopping, sweeping, scooping up water is useless unless you turn off the faucet first.

Why aren't we doing the same for our oceans?

Even if the "Ocean Cleanup Project", the Coastal Plastic Recycling Program, or any well-meaning ocean plastic company were to succeed 100 percent, the effect would be small and it would be too late.

More than 300 million tons of plastic are expected to be produced this year.

About 8 million tons of plastic are pouring into the oceans, adding to the 150 million tons that are already there.

It's been reported that 80% of marine plastic litter comes from countries with extreme poverty.

If you're stuck in poverty, your worries are always about getting food, shelter, and security, and recycling is just unimaginable.

That's why I founded Plastic Bank.

It's the world's largest chain of stores for the poorest, where you can buy everything in the store in exchange for plastic waste.

it's all

school tuition

medical insurance

Wi-Fi Mobile phone communication charges Electricity charges

SUSTAINABLE COOKING FUEL EFFICIENT STOVE

I also want to add all the other things that the world needs but can't afford.

Our store in Haiti is like a community center, and one of our collectors, Lisa Nasis, earns her living by going door to door and collecting raw materials from the streets and various businesses.

And at the end of the day, the ingredients are delivered to us, we weigh them, we check the quality, and we send the money back to your account.

Lisa now has a stable and reliable source of income.

The destination to transfer the consideration is the online account

Because it's a regular account, it's an asset that can be used as collateral when you get a loan.

Because it's online, it's safe from robbery, and more importantly, she sees a new value in herself.

New value will also be created for plastics.

yes

And then we take that plastic, add value to it, segregate it, remove the label, remove the cap.

Then shred it or pack it and prepare it for export.

It's no different than walking on a diamond pavement.

Even if Lisa tries to walk on diamonds, if there's no store, no bank, no way to use or exchange them, diamonds would be worthless.

And after the 2010 Haiti earthquake, Lisa became a widow, homeless and without income.

Now, thanks to this program, Lisa can pay for her two daughters' tuition and uniforms.

Now, we sell that plastic.

We sell to leading retailers like Marks & Spencer, companies that mandate their manufacturers to use "social plastics."

And there are companies like Henkel, a German consumer products company, that use social plastics directly in their manufacturing.

We closed the loop on the circular economy.

So go ahead and buy shampoo and laundry detergent in social plastic containers, and you're indirectly picking up plastic from the waterways that flow into the ocean, while at the same time contributing to poverty alleviation.

That model is fully repeatable

A church in São Paulo has a sermon urging parishioners to offer not only offerings on Sundays, but also reusable items.

we bring the poor to the church

A more effective way is to link the mosques in London with the poor churches in Cairo.

Others, like the PET Bottle Deposit Scheme in Vancouver, are now allowing individuals and organizations to return their recyclables and receive a deposit, and instead of receiving cash, they can deposit that amount into the accounts of poor people around the world.

You can support or create a recycler for recycling

If each household deposits one PET bottle, a large number of bottles can be collected all over the world.

Or, like the energy company Shell, we've invested in our plastic-neutral plan.

Plastic neutrality is similar to carbon neutrality.

But our plastic neutralization business invests in areas where recycling infrastructure doesn't exist.

And it will motivate the poor by raising the take-back price.

Or, like the slums of Manila, even the smallest markets with a simple scale and a mobile phone can now accept social plastic by weight as a new form of payment to reach more people and have a greater social impact.

The common denominator here is that social plastic has become the currency.

Social plastic becomes a currency, and when used as a globally recognized, tradeable currency, it can alleviate poverty and clean up the environment at the same time.

it's not just plastic

It's not recycled plastic, it's social plastic, and its raw material value is exchanged through the lives of those who acquire it, whether they're rich or poor.

Humans have produced more than 8 trillion kilograms of plastic, most of which is still left as waste.

eight trillion kilometers

One kilo is worth about 50 cents, so the potential value is about four trillion dollars.

I see Social Plastic as Bitcoin for the planet -- (Laughter) -- for everyone.

The entire circulation system is now supported and managed on an online banking platform that enables safe and reliable money transfers around the world.

Now, if you deposit your recyclables in Vancouver or Berlin, families in the slums of Manila can withdraw the money for building bricks and cell phone charges.

Or Lisa deposits recyclables at a center in Port-au-Prince, and now mom can withdraw them anywhere in town for cooking fuel or cash.

The app also features rewards, incentives, group awards, and user ratings.

We have gamified recycling.

We added fun and formality to an informal industry.

Based in Haiti and the Philippines

We also chose the staff of the Brazil chapter and our partners.

And this year, the focus is on India and Ethiopia.

We recover hundreds of tons of raw materials

We continue to add partners and customers to increase our daily collections.

As a result of partnering with Henkel, the company promised to use more than 100 million kilograms of raw material each year.

That alone could reward the poor in emerging economies with hundreds of millions of dollars.

And now we can all be part of the solution, not the cause of the pollution.

Ocean cleaning may be in vain

probably in vain

But preventing marine plastic litter may be the opportunity to do the greatest good for mankind.

thank you

(applause)

There is an African proverb, ``God gave clocks to whites and time to blacks''.

(Laughter) How can a person given so much time talk in 18 minutes?

it's a daunting task

When we talk about Africa these days, it's all about hunger and AIDS and poverty and war.

But what I want to talk about now is about success.

It's about a country called Namibia in South West Africa, which has a population of 2.1 million people.

It's about twice the size of California, and I'm in northwestern Namibia.

I'm from the countryside, in a place called Kunene Province.

in the heart of Kunene province

I was born in the village of Sethfontein, this is my hometown.

with Angelina Jolie

If you're familiar with Brad Pitt's story, you know where Namibia is.

I love the beautiful sand dunes of Namibia that are taller than the Empire State Building Wind and time

We've created strange landscapes, and in these landscapes live wild animals that are adapted to life in this harsh and unusual land. I'm the Himba.

You may be wondering why I wear clothes

I am both Himba and Namibian

Himba live in Namibia

I'm one of 29 ethnic groups, and I live a very traditional way of life.

I grew up grazing

Goats, sheep, cows, and other livestock.

My father took me out into the bush and said, ''John, you

I want you to be a good nomad, if you take care of animals

If you see a cheetah eating my goat Cheetahs are very nervous so walk over to them Walk over and slap your butt"

(smile)

"Then the cheetah will release the goat and run away," my father continued.

''If you meet a lion, don't move, just stand still

Puff out your chest and stare into his eyes

Then I might think that I don't want to fight with you." (laughs)

My father also said, "But if you see a leopard, run as fast as you can." (Laughter)

"Escape as if you're going to run faster than the goat you're caring for."

This is how I started learning about nature, in addition to being a normal Namibian, a Himba.

I'm also a trained conservationist, and if I go out into the grasslands, I know what to face and what to run away from.

It's very important to know that I was born in 1971 during apartheid.

White people farm and pasture

I was able to hunt as I wanted.

But we black people weren't considered to be allowed to deal with wild animals, and whenever we tried to hunt, we were called poachers.

And he was fined and put in prison from 1966 to 1990.

America and the Soviet Union

They fought for control of Namibia, and armies moved around during wartime.

Soldiers hunted for the precious rhino horn and tusks.

It sold for about $5,000 per kilo.

At that time, almost everyone in the Himba had a rifle.

It was wartime, so a .303 British rifle

It was all over the country around the same time, around 1980, but there was a severe drought.

Almost all the animals that were left died, including our livestock.

although it was protected

We were almost wiped out. Everyone was hungry. I remember one night.

A hungry leopard

He broke into a neighbor's house and took away a sleeping child. It's a very sad story, even today.

The memory never fades

No one can forget this incident

And the same year we lost almost everything

My father said, "Why don't you go to school?"

the year i started school

Father got a job at an NGO

It's the IRDNC (Regional Development and Conservation Integrated Trust), and they spend a lot of their time with people in the community, like the village chief, Joshua Kangonbe.

Trusted by locals

Joshua realized what was going on, the wild animals disappeared.

Poaching was on the rise. It seemed like a hopeless situation. Death and despair gripped Joshua and the entire community.

But then the people at the IRDNC suggested to Joshua that we pay people you trust.

Why don't you take care of the wild animals? If someone in your community is familiar with grasslands and wildlife,

Are you not there? The chief replied, "There are poachers." "What? Poachers?"

"Yes, poachers."

that was my father

my father has been poaching for a long time

somewhere in africa

I pulled off the debts of the poachers,

The IRDNC helped people regain their ability to manage themselves and their right to retain and manage their wild animals, and as people began to think that wild animals belonged to them, their numbers began to grow.

It became the cornerstone of animal protection in Namibia, and after Namibia's independence, this community-driven approach was endorsed by the new government.

There are three things that underpin this principle.

It's about respecting tradition and embracing new ideas. This is our tradition. The Himba village has a torch.

Where there is a torch, the souls of the ancestors are sent through the village chief.

It tells us where the water and the grass is and where we go hunting.

And here we combine a new idea, moving rhinos by helicopter.

than speaking through an invisible soul

It's a lot easier, isn't it? I learned these things from outsiders. I learned from outsiders.

We needed a way to grasp the size of the traditional Himba land.

Is the GPS showing the land correctly?

Or if it was just made in the West, we needed to know more about GPS. We also wanted to know if our ancestral maps matched digital maps made elsewhere.

Through these things we realize our dreams

We started to embrace new ideas while respecting our traditions. Second, we wanted to live a better life where we could benefit from many things.

Like my father, most poachers came from our own communities.

He was one of us, not an outsider.

sometimes even when they get caught

Treated with care and returned to the community

And we've come to share our dreams of a better life. The best people like my father - I'm not trying to sell him - (Laughter)

I've become responsible for stopping other people from poaching, and when this happens, we become a community.

I've come to know the connection with nature, and in Namibia it's a very powerful thing.

it's a partnership

The Namibian government has given legal status to our traditional lands.

business society

The business world has brought the world's attention to Namibia, where wildlife is no less important than any other method of farming.

It's been a valuable use of our land.

We have the latest conservation training done by the WWF, which has also funded the entire program for 20 years with the support of WWF.

We've grown from a very small program into a national one.

Sethfontein is no longer an isolated village buried somewhere in Namibia.

Because of these assets, we're now part of the Global Village, and it's been 30 years since my father started working with animals in his community.

My late father built his current success

I regret not being able to see it when I finished school in 1995.

We used to have only 20 lions in our entire Northwest, but now we have over 130.

(Applause) If you ever visit Namibia,

Please stay overnight in a tent

Do not walk around at night! (Laughter) The black rhino was nearly extinct in 1982.

Currently the world's largest in the Kunene region

There's a free-roaming black rhino colony outside the reserve.

(Applause) Now we have more leopards.

but they are far from the village

Wild prey like zebras and gazelles have multiplied many times over, so they're farther away, from less than a thousand to tens of thousands.

What started as a small activity of community custodians getting the community involved has now grown into a number of "management committees."

The Trustees are government statutory bodies that run themselves to benefit their communities.

There are now 60 management boards protecting and managing more than 13 million hectares of land in Namibia.

We've reinvented a whole country of conservation, and there's no other community-led conservation effort on this scale anywhere in the world.

(applause)

Trustees generated $5.7 million in 2008 in respecting natural resources

It's a new economy to build on, and you can use this money for many things.

Very importantly, we spend it on education, and then we spend it on infrastructure and food.

Equally important is spending money on AIDS education, because AIDS is rampant in Africa.

Good news from Africa

we want to say it out loud

(applause)

What the world needs now is you help me and my partners

To pass on what we learned in Namibia to other communities with similar problems, like Mongolia, or the northern part of your backyard, the Great Plains, where animals like buffalo are suffering and many communities are declining.

(Applause) What we did in Namibia was more than keeping wildlife healthy.

Because we've always dreamed big things, and we all knew that if we didn't improve the lives of our local communities, conservation would fail.

Or rather, come to Namibia and see for yourself what we've accomplished.

Also, visit our website to learn about community-led natural resource management initiatives around the world and how you can help.

Thank you very much. (Applause)

Imagine you are a member of the United States Congress.

I've been working hard

Knocking on thousands of doors, sweating and shivering in the cold depending on the season

Hundreds, perhaps thousands, of phone calls to strangers asking for support, asking for donations

I got this nameplate

It's hanging on the door of my room in Washington D.C.

I certify that you are a member of the United States Congress and a state representative.

Now imagine you're a conservative member of the United States Congress.

It takes a lot of imagination here in Boston, Massachusetts, right?

(Laughter) Let's imagine together that you are a conservative member of Congress.

Raised in the teachings of Milton Friedman

I love the free market he preaches, I love free enterprise, free trade.

I watch Ronald Reagan's farewell speech over and over again, and I cry every time -- (Laughter) -- and the speech hits the "shining town on a hill," and it continues, "If a town has walls, then those walls have gates that let in anyone who wants freedom."

I get goosebumps when I imagine President Reagan telling Gorbachev to tear down the wall.

You're a conservative member of Congress, but you share President John F. Kennedy's view that America is a special country.

For inspiration, go to YouTube and watch Kennedy's "Moon Rocket" speech at Rice University in September 1962.

I'm amazed that the president admits in this speech -- a 17-minute speech of pure American exceptionalism -- that some of the necessary components for a spacecraft have not yet been developed.

Still, yet, furthermore

America will reach the moon before the 60's are over.

You agree with Kennedy that this nation's oath will only be fulfilled when we, the United States, are the first to land on the moon, so we will go for it at all costs.

You were inspired by Kennedy's own words and actions: An optimistic leader demonstrates trust in the people he or she represents.

You're a conservative member of Congress, and you believe in the precautionary principle.

Believe in the power of data-driven analytics

We know that climate change is real, it's a man-made disaster, and we see a quiet, slow-moving Sputnik moment in climate change.

Greatness of the United States is required, as was the actual Sputnik Moment.

You are a conservative member of the United States Congress

I love the memory of Congressman Jack Kemp, and I agree with his conviction that the test of conservatism is whether it applies to everyone, regardless of skin color.

you show disgust for the alt-right

Reject any association with your own right-wing brand, party legacy

reject them completely

You're — (applause) you're a conservative member of Congress.

I stand up with compassion to save the life of an unborn baby from abortion, but otherwise I think it's rather strange that the government should intervene in things like nights out between consenting adults.

You are a conservative member of the United States Congress

Like John Adams, I fear the mob.

Because, like Adams, you know that the mob can't even guarantee its own freedom.

And I marvel at the wisdom of Adams and other constitutional makers, the wisdom that created a gentle deliberative governing process, an inherently conservative governing process.

it serves the country

Because I grew up more than I imagined

You are a conservative member of the United States Congress

I fear populist nationalism going wild because you know people who play with fire can't control fire.

And when you see the hoes and torches they carry, you know they're not building tools.

A hoe and a torch can destroy something and burn it down, but you can't build it.

We can't build the institutions and communities that are essential to a stable, prosperous country.

You're a conservative member of Congress and you're terrified of the upcoming county convention, because the Republican Party (GOP)

Because I want it to be a Grand Opportunity Party, not a Grumpy Old Party

(Laughter) And I know that people in attendance want to hear a certain cliché from you, that secret Muslim non-American socialists took over the White House and destroyed this country, but I know none of that is true.

(Applause) I know that the expected attitude is to take the president's disparaging remarks lightly, to allow the chorus of "send her to jail," and to allow policy statements to be made with as much sincerity and thoughtfulness as they could on Twitter.

You are a conservative member of the United States Congress

I find that many of my party comrades miss the good old days that didn't even exist.

They cling to the fossil fuels that fueled the 20th century's growth, but you know that we're in an era of cleaner, more abundant, better fuels, and that more abundance will make the world more energy accessible, more mobile and more free.

You are a conservative member of the United States Congress

I find that many party members yearn for the '50s and '60s, because that's the "good old days."

But at that time, the Cuyahoga River had a fire caused by waste oil.

I also know that in Pittsburgh, the soot in the air was so bad that the street lights were on in the middle of the day.

Schools were divided by race, discriminatory zoning was practiced in the community, communism threatened freedom, and cancer was thought to shorten life.

You're a conservative member of Congress, and you wish you could say like President Kennedy did when he spoke at Rice University, "It's no wonder some people want to stay where they are for a little while longer.

But you, with all your might, say with Kennedy, "But this city of Houston, this Texas, this United States of America, was not built by people who would sit back and wait and look back."

you are ready to lead

We are also ready to demonstrate the power of a liberal economy to solve challenges such as climate change.

I'm ready to lead you

Then I have a suggestion for you right now

to be in the lead

Step out of where you are and stand up

If you want America's finest brethren to die in the hills of Iraq and Afghanistan,

Is it unreasonable to ask you to stand up for your beliefs on the hills of Washington?

At the end of my life in Washington, the doorplate was taken off

It will be handed to you, and you will return home with it.

Can you imagine the emptiness of not defending any creed at that time? Instead of leading the fear-ridden people to a better place without taking any risks, I simply followed them where they were already going.

Unless you're willing to lose your seat, there's no reason to be there.

(Applause) Come on, it's not too late.

there is still time

Speak up, speak up, and make it clear that madness is madness.

Tell the American people that we have a big sense of adventure

Tell people at your county convention, ``Of course, a liberal economy can solve climate change.''

Tell them that Milton Friedman would tax pollution more than profits.

Tell them that it's okay if the progressives agree, and that it's actually a good thing.

Please share the good news that we can bring America together to solve our problems and become world leaders.

A liberal economy can do this

America should stop dividing and start building unity

say

Do your part before it's too late

(Thank you for applause

(applause)

Some of you may remember me at TEDGlobal, and I'm still obsessed with the issues I raised then.

I asked him: Why should we spend £6 billion to accelerate Eurail when, for maybe 10% of that price, we can take the best supermodels, both men and women, give out "Petrus" to every passenger, and enjoy the journey.

With £5 billion left, the passengers will ask you to go slower

I also posed this question: It's very interesting that a traffic light that flashes "35" and that sometimes shows a smile or a frown depending on whether you're over the speed limit or not, is actually more textured to prevent traffic accidents than a surveillance speed camera with real penalties.

There's something strangely unbalanced going on. In many fields, especially when human psychology is involved in solving problems, companies and organizations seem to have a tendency to take the strongest possible course of action. They want the most coercive course of action.

So it's a complete contradiction

So I would like to request a new title -- I'll talk about this later -- and propose to introduce a new word into the English language.

Because it seems to me that all the big institutions, including the biggest one, the government, are completely ignoring what really matters to us.

Let me give you an example

You may remember this as the merger of AOL and Time Warner, which at the time was reportedly the biggest deal in history.

Even now it may not have changed

I'm sure everyone here is in some way or another indebted to at least one of the merged organizations.

So, has anything changed around you as a result of this merger?

So unless you're a shareholder in one of the organizations, or you're a tycoon or a lawyer who was involved in this supposedly expensive process, you're involved in a big deal that's completely invisible.

In my years of marketing experience, on the contrary, it's the little things that actually do the most work in getting people to remember and approve of you.

This is Virgin Atlantic's upper class salt and pepper shaker set.

This in itself is pretty good, isn't it? It's a little aviation goods

But what's really more playful is that everyone who sees it comes up with the same mischievous idea, which is to say, "Let's rip it off."

But when you lift it up and look at the bottom, it's actually engraved into the metal: "Return from Virgin Atlantic."

(Laughter) And many years later, when faced with the choice between flying a 777 or an Airbus, you'll remember these words and your experience.

This is from Lydmar in Stockholm

Has anyone stayed at this hotel?

It's the elevator button over there.

Nothing has changed, right? However, this button does not specify each floor.

It starts in the garage in the basement like normal, but it's not a button that goes up from there.

It's actually labeled Garage, Funk, Rhythm End Blues.

You can choose the music for the elevator from several buttons

It would cost between £500 and £1,000 at most to install this elevator in Lydmar, Stockholm.

But it's probably more impressive than a hotel that claims it recently spent $500,000 replicating the most common room you've ever stayed in.

These are examples of trivial marketing

But at a recent TED event, Esther Duflo, who is now at the forefront of fighting poverty in the developing world, spoke.

She seems to have had a similar experience, and I was intrigued by the story, and it was an example of how you might feel embarrassed if you applied it to the world of business and politics because it's such a trivial idea.

The idea was to make the promotion of child immunizations a community event, and it used behavioral economics in a clever way, because if you had other moms around to get your kids immunized, you'd feel a lot safer than if you were alone.

In addition, to encourage vaccination, they gave every participant one kilogram of lentils.

it's really a small thing

If you're a UNESCO boss and someone asks you, "What are you doing to eradicate poverty in the world?"

"I know the answer. It's lentils," can't you confidently say?

Because of our self-aggrandizing tendencies, we tend to think that big problems come with big, fancy, and above all, expensive solutions.

But behavioral economics has shown, many times, really many times, that human behavior and behavioral change are grossly disproportionate. Changes in our behavior, and our attitudes toward others, don't always correspond proportionally to the amount of money we spend and the amount of effort we put into it.

But the organization is still in a form that is unacceptable for this imbalance.

So what happens in organizations is that the people who have the power to fix the problems have huge amounts of money.

Once you have a huge expense, you want the expensive stuff.

So we're missing the kind of people who have power but no money.

(Laughs) I want to raise people like that from now on.

It's also what happens to us called Terminal 5 Syndrome, which means that big, expensive things get a lot, very high attention, and they look great, like Terminal 5, but when you start looking at the details and you start looking at their usefulness, their role as landmarks, it's a disaster.

Come out of the airport's "arrivals" and walk while looking at the big sign that says "train" in front of you.

You'd expect to walk a few hundred yards more and kindly come across another yellow "train" sign.

No, no, next blue one appears on the left side and says 'Heathrow Express'.

It's like a comedy scene from "Flying High"

yellow sign? exactly what you would expect

Things are becoming more and more like British Airports.

I told you before, a very smart person asked me, "What are you going to do?"

They are doing the five things I suggested then

One of them, logically speaking, is a pretty good idea, and that's not to equip an elevator that just goes between two floors with up and down buttons, which is actually pretty scary, isn't it?

'Cause the door's closed and there's nothing to do, it's like a Hammer film horror

(Laughter) So, what's actually happening is actually what's important, and it's doing great things.

But the little detail called the user interface is very poor quality.

Also, even solving such a trivial matter seems to be a dead end.

Because those who can solve it are trapped by too much power and what they believe to be the solution.

I tried this during a banking conversation.

They said, "For activation of online banking

Can we do an advertising campaign?”

I was like, 'That's so easy

When users log in, there's probably a lot they want to see.

But what I don't want to see the most is my balance."

I have friends who don't use ATMs at all because they don't want to risk having their balance displayed on the screen.

Why would you want to be willing to know nasty information?

I would never do that

“If 'view balance' was made an option instead of the default, twice as many people would log into online banking and triple the frequency of use. "said

How many of these people check their balance when withdrawing money?

Because you are relatively wealthy

It's funny, no one checks, or they don't want to admit it's so methodical

But the interesting thing about this idea is that it doesn't cost £10 million to do it.

but never implemented

Because, as I said, there's a fundamental imbalance, which is that people with power want to do big, expensive things.

And there's a lot of unsubstantiated theories prevalent in the industry.

Come to think of it, it's very important to keep this theory.

Because if we succeed in convincing everyone that the success of an organization depends on the decisions of its own executives, we can justify a little bit of the pay disparity.

But what's really going on is -- spreadsheets are making things worse, but there's a lot more -- business and politics -- a kind of physics envy.

We are aiming for a world in which input and output are in good proportion.

It's the kind of mechanical world we all want to live in, where you can organize everything in spreadsheets, where you can quantify everything, and where you get what you pay for.

Such a world is ideal.

We actually live in a world that science can understand

But science is more like meteorology, which means that often small changes have disproportionately large impacts.

But it is very awkward to admit that we live in such a world.

But what I'm trying to say is that there's a very simple way to reduce that awkwardness.

This is also one of the measures, and I have no intention of denying that role.

Sometimes you can get big results by spending big money.

It would be wrong to deny this

Well, next is the consulting business

(Laughter) It didn't make sense for Accenture to abandon Tiger Woods so quickly.

'Cause he's an Accenture stereotypical sex service

(Laughter) We stopped dealing with single providers, and in many cases, we secured supplies closer to home, and the availability of one to three girls on call at any given time improved the evenness of load distribution.

I don't quite understand Accenture's frustration

And sometimes at no cost and no return

that's trivia

but there's still one more

The fundamental problem is that there is no equivalent word for this fourth

I don't know what to call it

And what's more, the money that goes into finding these things is totally inadequate. It's really trivial, and I don't know if it will work, but if it does, it's going to be something that will lead to a huge success that's nothing compared to the money, the time, the effort.

So let's start with a competition. I'd like someone watching this video to name that category in the bottom right corner of the screen.

And secondly, we need someone in charge of that effort. so I

He argues for the need for a "details chief"

It's a position that every company should have, and every government should have a "Minister of Detail."

There are people who have no money at all and can't afford to waste it, but they realize that they can actually make their government's plans more successful by doubling the alimony they distribute.

And if there actually is a Minister of Detail, and companies have Chiefs of Detail, the fourth category, now sorrowfully neglected, might finally start getting the attention it deserves.

Thank you very much

Chris: Have a public debate

The topic of discussion was "Does the world need nuclear power now?"

Before we go to the discussion, please raise your hands whether you agree or disagree.

Please raise your hand in favor

okay put it down

Who are you against?

Right now, it seems like the majority is 75 in favor and 25 against.

I'll take another vote after the debate, and I'm curious to see if that changes.

Each person will have six minutes to discuss the discussion. After that, both parties will briefly exchange opinions.I would also like to hear from the audience two people who agree or disagree with each other.

So let's move on from the pros to Stuart Brand, one of the founding fathers of the environmental movement and the author of the Whole Earth Catalog.

Stuart: Hi

(applause)

On the contrary, it is said that nuclear power is less fearful than intellectuals.

A classic example is James Hansen, a NASA climatologist who advocates for 350 ppm CO2 in the atmosphere.

He wrote a wonderful book called "Storms of My Grandchildren"

Hansen is working hard on this issue, and like many other scholars, he's promoting nuclear power.

Here's an example, the planet is warming and half urban.

as a percentage of the population

5 out of 6 live in developing countries

people moved to the city

Educating children and living peacefully without having many children

People are concentrated in the city, and next to work, electricity is the next thing they want.

If electricity is not available

Easy to steal Electricity is needed by poor people all over the world, whether in rural or urban areas.

Electricity in urban areas is called base load electricity

it is constantly being generated as needed power

Its sources of energy are coal and gas, hydropower, and nuclear power, which is reaching its limits.

Actually, it would be nice to have a fourth here, but solar power, wind power, etc. are not yet applicable because they are uncertain in terms of stability, hygiene, and scalability.

In that sense, nuclear power already has a track record of 40 years.

So from an environmental point of view, the most notable is the emissions from the two major energy sources, nuclear power and coal.

If all the electricity needed for a person's life is covered by nuclear power, the emissions will only fit in a cola can, although it's a heavy cola can of about 900g.

But in the case of coal, even a single day's worth of emissions in a typical thermal power plant would result in a staggering amount of CO2.

What about emissions?

Since most reactors do not have underground storage, nuclear emissions are stored in storage casks.

It's not that bad because it doesn't move on its own.

CO2, on the other hand, is being released into the atmosphere in gigatons of gigatons, and we still don't have the means to capture it, which is exactly what we're worried about.

Comparing the greenhouse gas emissions of different types of electricity, nuclear power is less than wind and hydropower, less than solar power, and even less than fossil fuels.

wind power is great i like it

I like spending time around that big wind turbine.

But we've found that wind power, like solar power, is a relatively unreliable energy source.

It requires a very large land area and requires about 5 to 10 times more materials than nuclear power.A typical wind farm requires 648 square kilometers for 1 gigawatt of electricity.

In fact, in countries such as Denmark and Germany, due to the installation location,

Wind power is reaching its limit

Power lines become overkill

hit a ceiling

Similarly, especially here in California, plans are underway to clear 2,589 square kilometers of desert with 80 solar power plants.

As an environmental scientist, I don't really want you to do that.

It might still be better if it's barren farmland

Sunlight is great on the roof

When it comes to land use, 1 gigawatt requires about 130 square kilometers of desert clearing.

Putting it all together, Saul Griffiths calculated that it would take an area roughly the size of the United States to produce about 13 terawatts of energy from wind, solar, and biofuels, which he calls "Renewistan."

British physicist David Mackay, in his book "Sustainable Energy," describes himself as not a nuclear advocate, but simply a profit maker.

(Laughter) From a military perspective, nuclear power is the best tool for disarmament.

We turned Russian nuclear warheads into electricity.

10% of US electricity comes from discarded nuclear warheads

we haven't started a nuclear stockpile yet

I think the audience will be most interested in the next generation of nuclear reactors, which are very small, around 10 to 125 megawatts.

This is made by Toshiba

This is what Russia built on the water

would be of interest to developing countries

This is the type that can be buried underground.

called a nuclear battery

It's very safe, and it helps prevent nuclear development.

This one was developed by Hyperion in New Mexico. This one is from NuScale in Oregon.

This is an integrated fast reactor manufactured by B&W.

Thorium Furnace by Nathan Myrvold

Governments will have to decide to raise the price of coal and promote nuclear power.

there is a future

(Applause) Okay okay

(Applause) Now for the dissent, a man who has been tackling energy and climate issues head-on for a long time.

He discovered in 2000 that smoke dust is the second largest contributor to global warming after CO2.

His team meticulously calculated the relative impact of different energy sources.

This is Professor Mark Jacobson from Stanford University.

Mark: thank you

(Applause) Nuclear energy pollutes the air more, emits more CO2, has higher mortality rates, and takes longer to build than geothermal, wave, wind and solar.

lead to further proliferation of nuclear weapons

So let's start with CO2 emissions.

CO2e is a value obtained by converting greenhouse gases and particles that cause global warming into CO2 concentration.

Wind and concentrated solar have the lowest CO2 emissions, as the graph shows

The chart has two bars

low and high quotes

The lower one is an estimate by the nuclear power industry The higher one is

Average of estimates calculated from 103 academic publications

This figure represents life cycle CO2 only

Next, regarding delays, nuclear power plants require 10 to 19 years from the planning stage to actual operation.

The breakdown is three and a half to six years to apply for installation permission

And it takes two and a half to four years to get a construction permit, and four to nine years for the actual construction.

China is currently building a 5 gigawatt nuclear power plant.

Construction time alone takes an average of 7.1 years Not including planning time

While waiting for nuclear power to be built, electricity must continue to be generated, usually using thermal power.

This chart shows CO2e emissions relative to wind power compared to nuclear power and other energy sources.

Wind power takes an average of 2-5 years, about the same as solar heat and sunlight.

Therefore, the difference between nuclear power and wind power etc. appears in the opportunity loss until construction is completed.

When these are added, nuclear power emits 9 to 17 times more CO2e than wind power.

And this doesn't include the space requirement issue.

Let's take a look at the health hazards of air pollution, which is the projected number of deaths in 2020 from car exhaust.

If All Cars in the U.S. Were Electric, Liquid Hydrogen Fueled, Flex or E85 Fueled

Between 50,000 and 100,000 people in the United States are currently dying from air pollution, of which 25,000 are due to exhaust fumes.

By 2020, this number will drop to 15,000 due to technological improvements.

On the right is the 2020 mortality rate for gasoline emissions.

Corn and cellulosic ethanol actually increase mortality slightly.

Nuclear would reduce it significantly, but not as much as wind or solar heat.

There is a connection between the spread of nuclear energy and the proliferation of nuclear weapons, because India and Pakistan secretly developed nuclear weapons by enriching uranium in nuclear power plants.

North Korea does to some extent

Iran is in progress

Venezuela may also have nuclear power plants

If we spread nuclear power all over the world, and as a result, if even one nuclear bomb were built and dropped on a large city like Mumbai, the additional death rate from that would be, on average, the population of the United States over a 30-year period.

become like this

Is this really the desired result?

what is the required area

Wind power requires less area than any other power source

Because, as you can see, all we need is the area of ​​the pillar that penetrates the ground.

In addition, 73,000 to 145,000 5-megawatt wind turbines would power all U.S. automobiles.

Moreover, a land area of ​​1 to 3 square km is sufficient.

Space, by the way, is another story.

always confused with land area

People confuse land area and space

As you can see from these photos, the space between the turbines can be used for other purposes, such as farmland, grazing land, and open land.

At sea, you don't even need land

Let's look at nuclear power What about nuclear power?

With facilities around here, we need about 44 square kilometers of buffer zone.

And we also have to consider the uranium mines.

Therefore, in terms of land area, nuclear power is disadvantaged over wind power.

This chart compares how much square footage it takes to move all the cars in the United States.

This is next generation biofuel cellulose from prairie grass.

This is corn ethanol, even smaller

It's based on all the data, nuclear power requires land the size of Rhode Island.

For wind, the space is large, but the actual land area is small

In the case of wind power, however, it could theoretically be located off the west coast.

And for geothermal, it's smaller than either. Solar is a little smaller than nuclear, but still quite small.

Now it's powering all the cars in America

If half of the world's power is supplied by wind power, approximately 1% of the earth's land area will be required.

Base load is irrelevant when matched to reliability

It is necessary to share power according to changes in demand

It can be realized by combining renewable energy

Here's an example from California with wind and solar data and

And with existing hydropower, it can supply hourly demand.

This is the world's wind resource

The world has 5-10 times more wind resources than we need

The above is summarized as a ranking

The last thing I want to show you, if you choose between wind power and nuclear power,

If you choose wind power, the ice will remain

If you choose nuclear power, the North Pole will melt.

A beautiful blue sky or an uncertain future with nuclear power

(Applause) Chris: Okay.

Then, while each guest is thinking about their answers, two people from the audience also give their opinions.

If you're in favor of nuclear power, please raise your hands.

Opposite one hand

Please pass the microphone to two people

Now, in response, each of you has one minute to challenge the other, anything.

Stewart: Where we disagree is on weapons and energy.

These slides say that nuclear power emits a lot of greenhouse gases. People like to associate nuclear power with war, but I think this is kind of clever.

In reality, 21 countries have nuclear power.

7 of them have nuclear weapons

All of these countries had nuclear weapons before atomic power.

Two countries, North Korea and Israel, have nuclear weapons, but none of them have nuclear power.

Countries with the greatest need for clean energy, such as China, India, Europe, and North America, have resolved their relationship with nuclear weapons.

In that case, it would be preferable to conduct detailed inspections of nuclear fission in countries such as Iran and Venezuela.

Promoting nuclear power means thorough nuclear control, and everyone's understanding of this will lead us to move forward together with the weapons issue.

Chris: So Mark, what do you want to say in 30 seconds?

Mark: It's a fact that India and Pakistan built nuclear power plants and used those facilities to develop nuclear weapons under the hood.

We don't need nuclear power

Sufficient sunlight and wind

Sufficient for practical use as shown in the figure

real data shows

This is ongoing research, not space exploration or anything like that.

Using renewable energy can solve the world's problems

We don't need nuclear power

(Applause) Chris: So who's in favor of that?

I'm Rod Beckstrom, CEO of ICANN.

I've been involved in global warming policy since 1994, and this issue was one of the outcomes of the Kyoto Protocol when I became a board member of the Environmental Defense Fund.

I agree with Stewart's opinion

Opinions have changed in the last 10 years

I used to be anti-nuclear.

Now, I stand by Stewart's view, especially from a risk management perspective, and I think the risk of climate change outweighs the risk of a nuclear accident.

But there's a solution that both sides can agree on. There's a way for both sides to win this debate.

The U.S. Senate needs a bipartisan vote to pass a climate action bill, but it's just one or two votes short, and I think we can help.

If we can just pass the bill, Mark will solve the problem.

Chris: Thank you Mr. Rod.

I'm David Fanton, let me tell you something.

First of all, you should be aware of the propaganda

Industry propaganda has always been very powerful.

We don't really know what the other side is saying. People make their own interpretations.

should be aware of the propaganda

then think about

All the emissions from a nuclear power plant are transported by quite a few trucks and trains every day.

There is no guarantee that traffic accidents will not occur

Substances that continue to be toxic for 100 or 1000 years are not necessarily released into the living environment due to traffic accidents.

I think those trucks and trains that run every day could be good targets for terrorists.

Chris: thank you

the proponents

Is anyone there?

My name is Alex and I'm a big fan of renewable energy.

Solar power on the roof of the house

I own a water wheel that produces hydroelectric power.

In this way, I am in favor of renewable energy.

I think I have a basic math problem

The sum of all the hours of sunshine, the wind, the amount of precipitation, it's not enough.

So to keep the electricity going, we need a solution that can keep generating electricity at all times.

I campaigned against nuclear weapons in the '80s, and I still do.

But now we can reuse those nuclear weapons and use them to generate electricity.

That will also solve this calculation problem

Renewable energy alone cannot provide enough

We always need solutions that can generate electricity

Nuclear power is the solution to always have electricity.

Chris: thank you

What about the other opposition?

In your previous comment, you mentioned that we don't have enough renewable energy resources.

You've already proven that you're good enough on stage.

So the inference that we don't have enough resources to supply enough electricity for our needs is wrong.

One more thing I can say

As claimed by Ray Kurzweil and others, technology has advanced by leaps and bounds.

You can't just look at renewable energy today and say, "This is going to be hard."

Because in five years there will be many alternatives to nuclear power.

Chris: ok thank you

(Applause) Now, each of you in 30 seconds, give me your final words.

from stewart

Stewart: I like the diagram you showed me where "it all makes sense".

The weather is fine during the day and the wind is strong at night

It's been unusually cold in the UK right now.

No wind for a week in all territories

none of these have happened

I ended up buying nuclear energy from France

2 GW through the Channel Tunnel

this is happening repeatedly

I used to care about long-term storage of emissions, but

Radioactive waste can be used as fuel for next-generation nuclear power generation

And small reactors are particularly hopeful

As Nathan Myrvold said, I'm going to lobby Congress to get the Nuclear Regulatory Commission to push for small reactors, which is needed not just in the United States, but in the world.

(Applause) Mark: We've analyzed hourly demand and supply, solar and wind California data.

And we found that we could meet demand for most of the year.

In terms of resources, we created the first wind world map, measured at 80m height.

Resources are already known and 15% can be covered

15% of all US

Good wind speed for the cost

Wind is more abundant than sunlight

Reliable with plenty of resources

Chris: OK thanks Mark

(Applause) If you're in Palm Springs-

(Laughter) (Applause) Shameless.

(Applause) Dear TED community, So does the world need nuclear power now?

Please raise your hand if you agree

(Cheers) Opposite

Huh

I see···

So if this discussion changes your mind, please raise your hand.

Among those who have changed their minds, those who agree, please raise your hand.

As a result

They support both, but from what I've counted, the audience seems to have gone from 75-25 to 65-35.

Congratulations to both of you

thank you

(applause)

This live house is the place where I played my own songs for the first time when I was young.

It was a venue with very good acoustics.

The walls were all bumpy and full of garbage, but the sound was very good.

This song was recorded there

(Music) Well this picture isn't Talking Heads

(Song: Clean Break by Talking Heads) In that place I can hear words better

I understood the lyrics very well.

The sound system is also decent

There was not much reverberation

That's why I was able to hear the rhythm properly and play it perfectly.

There are similar places in other areas

This is Nashville's Tutties

They were working with different types of music, but the structures and shapes of the buildings were very similar.

The behavior of club regulars is similar.

When they played Tutties and CBGB, the band would turn up the volume and fight against the crowds who were rioting, screaming and doing whatever they wanted.

After that, I started playing in slightly more expensive venues.

Places like Disney Hall and Carnegie Hall here in LA.

it was very exciting

That's when I realized that the music I made then and in the past didn't sound so good in these halls.

I tried to do something about it, but somehow my work at that time didn't sound right in the hall.

So I asked myself, was my work conscious of space?

Did I think about the place and the venue when I wrote the song?

Isn't this one way of creating?

When we create something, do we think about the place and the background?

Now it's African music

(Song: Wenlenga / Omnibus) You know that most of the roots of popular music originated in West Africa.

African music, yes, the instruments, the complex rhythms, the playing style, the scenery and the setting, everything is perfect.

fits the environment

The big venue doesn't reverberate and throw the rhythm out of whack.

Instruments are loud enough to be heard without an amplifier or anything else.

No equipment trouble

perfect for the african environment

But it wouldn't fit in a situation like this: a Gothic cathedral.

(Song: Apart from you I am by Thomas Tallis) This kind of music is suitable for Gothic cathedrals.

No scale changes, timbres are lengthened, almost no rhythm, architecture complements the music.

It actually improves sound quality.

In this space Bach composed, this is the organ.

It wasn't as big as a cathedral, so I could write complex music.

We were able to innovate by changing keys without the risk of major cacophony.

(Music: Fantasia "Jesus My Joy" by Bach) This is a little later.

Mozart wrote music in these places

I believe it was around 1770.

With less space and less reverberation, I was able to write really ornamental music. It's complicated, but it works.

(Song: Piano Sonata No. 13 by Mozart) Fits perfectly into the space

This is Scala

It's about the same period, I think it was built in 1776.

When these opera houses were built, it was common for audiences to cheer.

While eating and drinking, we cheered towards the stage, like everyone does at CBGB.

When I thought I liked Aria, I yelled for an encore, not just after the show, but suddenly during the show.

(Laughter) But it was an opera.

This is the opera house Wagner built for himself

not that big space

smaller than here

But Wagner revolutionized

I wanted a bigger orchestra

You wanted to make it look extravagant. By enlarging the orchestra pit, you were able to add some low-end instruments.

(Song: Prelude to Act 3 of "Lohengrin" by Wagner)

this is carnegie hall

As you know, this kind of hall has become mainstream

Carnegie grew in size, especially

It's bigger than other Symphony Halls

These places echo better than La Scala.

Alex Ross, who was writing for The New Yorker around this time, said that it had become a rule that the audience had to be quiet during the show and not eat, drink, cheer or whisper.

The hall became quiet

The reverberation and silence of the hall made it possible for a different kind of music to fit right in.

It allowed us to use extreme dynamics that had never been seen before in this kind of music.

I can now hear the quiet parts that were previously drowned out by small talk and cheers.

The reverberation forced the music to be a little less rhythmic and structured in places like Carnegie Hall.

(Song: Symphony No. 8 in E-flat major by Mahler) This is Mahler

He looks like Bob Dylan, but he's Mahler.

The picture is Bob's latest work.

(Laughter) Around this time popular music emerged.

this is a jazz band

According to Scott Joplin, the band played on riverboats and clubs.

It's a noisy place again

I was playing accompaniment to a dance, and there was one part of it that the dancers liked.

And they say, "I'll do it again just now."

For the sake of the dancers, if they were made to play the same parts over and over again, they would eventually get tired of it.

Bands began improvising melodies

It was the moment when new music was born

(Song: Royal Garden Blues by Handy/Waters) Jazz was played only in small venues

Everyone was dancing and shouting and drinking

So I had to play louder than that to hear properly.

This was the beginning of the 20th century, but the same is true of popular music throughout the century, like rock and Latin music.

Not much has changed in terms of live music.

After one-third of the 20th century passed, a change occurred, and radio became the mainstream sound source.

Microphones were a factor in the evolution of music.

The presence of microphones allowed musicians, composers, and especially singers, to write completely different types of songs.

Many of the songs that were played on the radio were played live, but singers like Frank Sinatra were able to do things they never could have done without a mic.

The change was even more pronounced for post-Sinatra singers.

(Song: My Funny Valentine by Chet Baker) It's Chet Baker

Singing like this wouldn't have been possible without a mic.

would not have been possible without recording technology

I can hear him singing from the right side

I can hear his whispers

This effect is due to the microphone

I hear whispers as if they were sitting next to you

And at this point the music splits in two.

live music and recording music

They don't have to be exactly the same anymore

And now there are venues like this one, it's a disco, there's a jukebox in the bar, where you don't need a band anymore.

We don't need any kind of live band playing anymore, sound system is nice.

And music began to be created specifically for discos and sound systems.

And like jazz, dancers liked some parts of the song more than others.

This is why early hip-hop began to repeat parts of songs.

(Song: Rapper's Delight by Sugarhill Gang) Just like jazz musicians improvised, MCs began to improvise raps.

New music was born here

As gigs become more popular, for capacity reasons, we end up playing in the worst acoustic stadiums on earth, basketball arenas, hockey arenas, and so on.

So the musicians did their best

I started writing medium ballads, now called arena rock.

(Song: Endless Journey by U2)

It's a medium tempo song that sounds epic.

It's driven by a social situation rather than a musical situation.

Songs written for these venues are perfect for their situation.

And we have a new space

In the car is one of them.

I grew up with car radios

But now radio has evolved

The car is the live venue itself

(Song: Who You With By: Lil Jon & The East Side Boys) I'd say this music was made for cars It's a perfect fit

You might not want to listen to it at home, but it's great for listening in the car Wide frequency spectrum with big bass and high end Vocals stay in the middle range

You can share the music you listen to in the car with your friends.

Another new way to listen to music is the MP3 player.

Perhaps this player is for Christians only.

(Laughter) It's like listening to music in a place like Carnegie Hall, where the audience is quiet, because you can hear every single note.

In other words, it's like West African music. When the music on your MP3 player goes quiet, you turn it up.

this is not very good

Especially in modern pop music, to a certain extent, the songs are written with MP3 players in mind, so you can hear a lot of detail, but there's not a lot of sonic dynamism.

So I asked myself, is adapting to our environment a way of creating?

I wonder if it's happening elsewhere

As David Attenborough and others have said, so do birds. Birds on the branches of that tree tend to be higher pitched and shorter and more repetitive where the foliage is denser.

Their calls tend to be low-pitched when standing on the ground, so their voices are less amplified when they take off from the forest floor.

The savannah sparrow has a tendency to hum (sound clip: savannah sparrow)

It turns out that this type of call is the most practical and energy efficient way to call out to your friends in the grasslands and savannas.

In addition, there are birds of the same species that sing in different ways, such as this bird called Fukindori.

The windbird calls like this in the slightly denser forests of the east coast of the United States, but on the opposite west coast (sound clip: red windbird) it makes a different call.

(Sound clip: Akafukindori) Birds adapt to their environment too.

So I thought, is this a form of creation? Can it be a rough form? Do I write songs with the environment in mind?

I think it's revolutionary

It is acclimatized

But the fun, the passion and the joy are not lost.

This is the exact opposite of the traditional, romantic way of thinking.

In the romantic way of thinking, passion comes first, then emotion pours in, and then detailed shapes are created.

The theory is that there's a form first, then instinct and intuition first builds the form, and then you pour your passion into it.

I've already decided where to pour my passion

Well, it's interesting to see this difference in thinking.

Author Thomas Frank explains why voters sometimes vote against what they support. Many voters like us tend to assume that sincere words come from a credible, heartfelt passion.

that's why i vote

If someone can pretend to be sincere, or to pretend to be passionate, then they have a better chance of winning that way, which is a little bit dangerous, isn't it?

Passion and joy are not mutually exclusive

Now, I think we need to realize that we are like birds.

adapt to the environment

sing

Even if we change ourselves to suit our environment, we, like the birds, carry on with us the same joy.

thank you

(applause)

After my last TED talk in 2006, it became clear that global warming was pretty serious, so the magazine Skeptic took the issue seriously.

This magazine covers all sorts of controversies, from science to pseudoscience, but don't worry about that, because 2012 will be the end of the world.

I'd like to introduce you to one more update: the Quadro Tracker.

It's like a dowsing stick

In a plastic case with a swinging antenna

When you carry it around, it shows you where things are.

For example, pointing to the marijuana hidden in the locker.

(Laughter) This device I just got finds golf balls, and it's especially effective on the golf course when you're really digging around the rough.

Now let's take a look at this kind of junk in action.

This is ADE651, which was sold to the Iraqi government for $40,000 each.

This device is also completely useless, but it's said to work on the principle of electrostatic magnetic ion attraction.In other words, it's pseudoscientific bullshit.

In this case, relying on the signal of this little detector to let people through at a checkpoint is actually a matter of life and death.

Believing in pseudoscientific products is dangerous.

So today I'm going to talk to you about believing.

I want to believe you want to believe

In fact, the theorem I'm about to explain shows that believing is the natural state.

I originally chose it and believed it

believe in all things

Belief is the norm. Disbelief, suspicion, science, etc., are not natural.

these are more complicated

If you don't trust something, you won't feel at ease

Some people, like Fox Mulder on "The X-Files," want to believe in UFOs.

Essentially, we're pattern-seeking primates.

Connect A and B B and C

Sometimes A and B are actually related, and this is called associative learning.

We find patterns and relationships, like Pavlov's dogs that associate the sound of bells with food and reflexively salivate when they hear bells, or Skinner's theory that rats associate their behavior with rewards and then repeat the same behavior.

Skinner also discovered that when you put a pigeon in a box like this and you choose one of the buttons to press, the pigeon tries to find a pattern. A small reward you give to this pigeon is randomly assigned so that there's no pattern in it.

It repeats its pattern of behavior, regardless of what it did just before it received the reward.

And if you do two counter-clockwise rotations, then you're going to rotate clockwise and poke twice, or something like that.

It's called superstition, and unfortunately we live with superstition all the time.

This effect is called "patternability," and it's the tendency to find patterns in the information we're given, whether meaningful or not.

There are two kinds of mistakes that can happen when this effect works.

Type I mistakes are false positives, believing a pattern exists when it doesn't.

Type II mistakes are false negatives

It's about believing that patterns exist but they don't.

So let's do a thought experiment here.

You, a primitive man, are walking the plains of Africa 3 million years ago.

Your name is Lucy, okay?

I hear a rustling sound in the grass

Is it a dangerous carnivore? Or is it just the wind?

You may be making the most important decision of your life.

If you think the noise in the grass is carnivorous, but it's actually just the wind, you're wrong and you get a Type I false positive.

No real harm, just escape

I was cautious and cautious.

But if you think it's just the wind, but you're actually a dangerous carnivore, they'll make you lunch.

by Darwinian selection

expunged from the gene pool

The bottom line is that if the cost of a Type I mistake is less than a Type II mistake, then there is patterniness.

Well, today's formula is just this

Evaluating the difference between Type I and Type II in terms of detecting patterns is a very tricky problem, especially in a life-and-death moment.

We originally assumed that all patterns existed, that all grass sounds were carnivorous, not wind.

in human evolution

The engine of believing, the search for patterns -- that's probably what's left in the brain through natural selection, and the patterns we find always suggest predators, malevolent entities, and so on. More on that later.

For example, what does this photo look like?

yes this is a horse head

looks like a horse definitely

that's the pattern

Is it really a horse?

Doesn't it look like a frog?

Now, pattern detection is thought to be a function of the brain's anterior cingulate cortex, and our little detectors are gullible, and that's the problem.

For example, what do you see?

yes it's a cow

Once you've given the information -- it's called cognitive priming -- once you've told them there's a cow in the picture, they can already see it without even the auxiliary lines.

What do you see here?

can anyone see a dalmatian

I'm actually here. This is also priming.

Now, if you go back to the painting without priming, your brain already remembers the model and it looks the same.

what does this look like?

Saturn is good

How about this one?

shout out if you see anything

You guys are amazing Chris

Because it's an empty picture, there should be nothing

Here's an experiment that Jennifer Whitson at the University of Texas at Austin did in the workplace and found patterns when things felt unclear or out of control.

So almost everyone saw Saturn

When I feel out of control, I find something in this patternless painting.

In other words, the probability of finding patterns increases under uncontrolled circumstances.

Baseball players, for example, are notorious for carrying good luck when they stand in the batter's box, but not when they're on the field.

Because the defense has a 90% to 95% chance of success.

Even the best hitters retire 7 out of 10 at-bats

So all of the auspicious spells and spells are related to the feeling of being out of control.

So what do you see in this part of the picture?

Anyone know?

There's actually something here. It's a little hard to see.

Think about it, listen. This is an experiment by British psychologist Susan Blackmore, who looked at how scores on seeing this ugly picture correlated with performance on psychic tests and beliefs in the paranormal, the supernatural, and angels.

Subjects who scored high on the psychic test not only found more patterns in the hard-to-see pictures, they were also more likely to find patterns that didn't exist.

I showed you this picture

This picture of the fish was obfuscated at different levels, from 20%, 50%, to the 70% that I showed you.

A similar experiment was conducted by a psychologist named Peter Brugger, who found that the perception of meaningful patterns was significantly more likely to occur in the right hemisphere, entering the left visual field.

If you're shown a picture that your right brain perceives instead of your left hemisphere, it's easier to spot patterns than if you're shown a picture that your left hemisphere perceives.

Many of the phenomena of "patternity" are thought to occur in the right hemisphere.

Now let's see where in the brain it happens.

Brugger and collaborator Christine Mohr gave the subjects L-dopa.

L-dopa is a drug for Parkinson's disease, which is associated with a decrease in dopamine.

L-dopa increases the amount of dopamine

And when dopamine was increased, they found more patterns than the group who didn't take dopamine.

So dopamine seems to be a drug related to "patternity."

In fact, paranoia, delusions, hallucinations, and other abnormal behaviors for which neuroleptic drugs are prescribed are all problems of "patternity."

Wrong pattern False positive and Type I error

Administering drugs that suppress dopamine solves the problem.

By reducing the amount of dopamine, we can reduce our tendency to see pathological patterns.

Amphetamines, like cocaine, on the other hand, are dopamine agonists.

increase the amount of dopamine

That means you'll feel more euphoric, more creative, and more likely to spot patterns.

In fact, Robin Williams recently said that he was much better off when he was on cocaine.

More dopamine may be more creative

Dopamine seems to change the signal-to-noise ratio.

That is, how exactly do you find patterns?

If the sensitivity is too low, Type II mistakes are more likely to occur

Missing patterns that exist and—

skepticism misses novel ideas

Creative in moderation and doesn't fall for silly stories

If the sensitivity is too high, too many patterns will be found.

I feel like I'm being stared at just by making eye contact with someone

I feel like I'm being talked about

When it goes too far, it ends up being called insanity.

You could say it's the difference between two Nobel laureates, Feynman and John Nash.

One person saw the pattern of degree needed to win a Nobel Prize.

The other finds patterns to the point of excess

I have become schizophrenic

Signal-to-noise ratio reveals pattern detection problems

You all know what this is all about, right?

What patterns do you see?

Again, the challenge for the anterior cingulate cortex is the inconsistency in pattern recognition.

These are Via Uno shoes

sandals

I have very sexy legs

may have been processed

Thanks to this ambiguous shape, the point of view changes

What you often think about actually affects what you see.

this is a lamp yes

It's got electricity

Because of the environmental movement, everyone is sensitive about the plight of marine life.

This particularly vague picture is, of course, a dolphin.

There's one here, there's one here, there's one here

Everyone, that's a dolphin's tail fin.

(Laughter) Again, when you show conflicting data, the anterior cingulate cortex flies to the next day.

If you look here, it's fine, but if you look here, it's strange

If you rotate this picture, you can see the mechanism.

"Impossible wooden box" illusion

It's easy to fool the brain with flat pictures

If you say, "What is that optical illusion? It's in an introductory psychology book. Everyone knows it."

This is a three-dimensional version of the "Impossible Crate" created by the late Jerry Andrus, with Jerry himself standing inside the crate.

He was kind enough to show me the trick in this photo.

It's all about the camera angle. I took it from the other side.

But if you hide this picture, your brain, deceived by this powerful optical illusion, will be stuck in its original pattern.

This is a fairly new optical illusion that can fool you when comparing the angles of two photographs.

It's actually just the same photos side by side.

When you compare that angle, not this one,

the brain is tricked

Once again, the pattern recognizer is fooled.

Face recognition is easy because the temporal lobe has specially evolved software to recognize faces.

There are some faces on the rock face

The photo may have been manipulated—

Faces are easy to recognize

Now which face looks weird?

Which one is the strangest at first glance?

It's on the left.

Yes everyone is correct

This illusion was first created by Margaret Thatcher

Created each time a new politician appears

Why is this happening?

We know exactly where it's going to happen, right here in the temporal lobe, right above the ear, there's this little tissue called the fusiform gyrus.

There are two types of cells working together to capture holistic facial features and parts of the face.

You can easily tell it's Obama

And then, just a little bit, you realize that the eyes and mouth are weird.

Especially for upside-down photos, common facial recognition software works first.

Now, going back to our little thought experiment, imagine yourself as a hominid of the African plains.

Was it the wind, or is it a dangerous predator?

what is the difference between these

The wind isn't a living thing, but dangerous predators move with purpose.

This process is called agenthood.

It's about giving the pattern meaning, intent, and subjectivity, often assuming a higher, invisible presence.

I got this idea from my TED colleague, Dan Dennett, from the standpoint that everything has a purpose.

I think this explains a lot of things: souls, souls, ghosts, gods, demons and angels, aliens, intelligent designs, and all sorts of invisible beings who are believed to be threatening the world with governmental machinations, power and intent, and controlling our lives.

This is probably the root of animism, polytheism and monotheism.

For some reason, aliens are more advanced and virtuous than humans, and they come to Earth to save us.

The story of intelligent design is the story of a transcendent, intelligent, moral being who descended to create life.

Even governments may be able to save us. This story is no longer the tide of the future. It's just a kind of agenthood.

This is also the root of conspiracy theories

Somebody was pulling the strings behind the scenes, like the Illuminati or Bilderberg.

This is a pattern recognition problem

Some patterns are true, some are not.

Was JFK's assassination a conspiracy or a lone perpetrator?

Whenever I visit a scene, someone is there to guide me to where another sniper was.

There is also a great story that it was hidden in a manhole

He jumped out just before and shot.

But Lincoln's assassination was a conspiracy

Nor can we dismiss all patterns uniformly.

There is also a pattern of truth

There's truth in conspiracies

can be explained by this

There's a conspiracy theory about the 9/11 incident, it's a conspiracy.

We also publish a special issue

It's a conspiracy by 19 al-Qaeda people to crash a plane into a building.

Conspiracy theorists don't think like this

It's a plot by the Bush administration.

It's a completely different story

So why is the Bush administration not plotting 9/11?

because it was successful

(Laughter) (Applause) We are born dualists.

This kind of movie is interesting because of the agent nature at work.

In short, you can imagine the situation, so you can enjoy it.

By stimulating the temporal lobe, you can create an out-of-body sensation, a near-death experience, just by inserting an electrode into the temporal lobe and touching it.

Or you experience it when you lose consciousness in a centrifugal accelerator.

When hypoxia is called hypoxia

The brain learns the sensation of astral separation.

And then I went to try Michael Persinger's God Helmet, which stimulates the temporal lobe with electromagnetic waves.

Then you will experience the sensation of astral separation.

So I'm going to show you a short video at the end, and it covers everything we talked about.

It's a minute and a half video

When the power of expectation and the power of belief combine

see what happens

It's an audition venue for fake lip balm ads.

I'm thinking of using it for a national broadcast commercial.

Let me test the lip balm I prepared here.

These two models can help you out, Roger and Matt.

I prepared my own lip balm This is a luxury brand product

Is it okay if I kiss a model for testing?

Right on

Are you okay? / yes / is that okay?

That's fine/That's fine This is a blindfold test

I'll start when you give the signal, so put on your blindfold.

ok i can't see anything / Please pull me so that I can't see anything from below / Okay, can't you see anything anymore?

yes/no what i want to see in this test is how the cream protects the feel of your lips.

Yes/Is this your first kiss test? yes

come here

Come on, curl your lips

If you curl your lips a little earlier, it's fine

(music) (laughter) (laughter) okay

Jennifer how are you?

splendid

(laughs) no

(laughs) Thank you. Thank you.

If you're here today, if you're watching this talk at another time, or somewhere else, you're all part of the digital rights ecosystem.

Whether you're an artist, an engineer, a lawyer, or a fan, the handling of copyrighted material directly affects your life.

Copyright management is no longer just a matter of ownership, it's a complex web of relationships that has become a key issue in our cultural scene.

YouTube cares a lot about the rights of content owners, but in order to give them options about how to deal with things like copying and mashups, they first need to be able to recognize copyrighted material when it's uploaded.

Let's look at a specific example to understand how it works.

Two years ago, singer Chris Brown released the music video for his new song "Forever."

A fan saw it on TV, recorded it with a phone camera, and uploaded it to YouTube.

Sony Music Entertainment has registered Chris Brown's videos with YouTube's Content ID system, so if you try to upload a video, it will be detected in the blink of an eye and Sony can choose what to do with it.

So how do you detect that it's a copy?

First, the content owner submits the content to YouTube's database and sets a usage policy on what to do when a copy is detected.

YouTube checks each upload against reference files in its database

This heatmap shows how the brains of the system work.

In this way, the original reference file is matched with the uploaded one

This system checks each point in the video against a reference file.

So it can detect whether the copy is just a small part of the original, whether it's played slowly, or the quality of the audio or image has been degraded.

And YouTube does this every time a video is uploaded.

That amount is more than 20 hours per minute

If a match is found, it will be processed according to the policy preset by the rights holder

The scale and speed of this system is truly staggering.

We're not talking about a couple of videos, because if you combine new videos with the regular content scans of the entire site, you're going to be checking 100 years of videos every day.

We match those 100 years of video against millions of reference files in our database.

It's like 36,000 people watching 36,000 monitors all day long.

What do you do once a match is confirmed?

Many rights holders allow copies to be published instead of blocking them.

And they profit from the exposure and the advertising and the sales of the products they link to.

Chris Brown's "Forever"

It fell out of the ranks after being popular, and that seems to be the end of it, but last year, a young couple got married.

I made a ceremony video like this

you may have seen

(music) If it's so much fun just to enter, how much fun the reception was!

I am interested in what kind of people they are

I definitely want to go to a wedding like this

This little wedding video has been viewed over 40 million times since it went up.

Sony did not block this and allowed the upload.

And I put an ad for this video and linked it to iTunes.

A year and a half after its release, this song returned to number 4 on the iTunes charts.

Sony could profit there again

A happy couple, Jill and Kevin, have just returned from their honeymoon to find that their video has gone viral.

I ended up appearing on a lot of talk shows, and I used this opportunity for good.

The video raised $26,000 to fight domestic violence.

"JK (Jim and Kevin)'s Entrance Dance" is so popular that NBC has parodied it in the season finale of "The Office," which is just about to air.

Not only are amateurs ripping off the work of major studios, but the big studios are also ripping back.

By giving choice, we create a culture of opportunity.

The only thing that needed to change was giving them a choice when it comes to copyright checks.

So why has this problem remained unsolved?

Because this is a big, complex and intertwined problem.

It is not uncommon for a single video to have multiple rights holders.

multiple record companies

music publishers involved

The company may be different depending on the country.

Many songs in one video

So you have to manage a lot of rights for one video.

YouTube's Content ID system handles all of these cases.

But this system won't work without the cooperation of rights holders.

If you have content that someone puts on YouTube, register it in the Content ID system so you can have choices about how you use that content.

Think carefully about your content policy

If we simply ban reuse altogether, we lose out on new forms of production, new audiences, new channels and new revenue opportunities.

But it's not all about money and exposure

I want you to look to the joy that progressive rights management and new technology can bring.

And I think you'll agree that joy is definitely an idea to spread.

Thank you for your attention

(applause)

Thank you. Today, let's take you to the world of underwater music played by whales and dolphins.

It's a difficult world for us visual races to comprehend, so we've provided some pictures and sounds to help you understand.

As a visual species, what does it look like in the ocean when we snorkel or dive?

I can't see very far

The human eye works well in the air, but in water it's restricted and narrows your vision.

Over tens of millions of years, marine mammals have evolved ways to use sound to explore the underwater world and communicate with their peers.

Dolphins and toothed whales use ecolocation

It makes a loud clicking sound and hears the sound bouncing off the seafloor to orient itself to swim.

It also listens to feedback from prey, locates food, and selects target prey.

All marine mammals communicate by sound

Greater baleen whales use long, beautiful songs during breeding to search for mates and choose mates.

Mothers, babies, and other closely related individuals use vocalizations to locate each other, and sounds are very important for survival.

My interest in the sounds of sea animals, a world that was uncharted to me, was sparked by data from a captive dolphin that imitated human sounds.

Earlier, I said that we use diagrams that represent sounds visually.

Here is the first example

It's a graph of frequency against time, sort of like a musical score, with high notes at the top, low notes at the bottom, and time flowing to the right.

This is the sound of the trainer's whistle, which is played when the dolphin has performed a trick and is rewarded with a fish.

It is a sound like "tweeee"

And here's a captive dolphin pup mimicking that whistle.

I would be very surprised if a dog or cat hummed this sound and responded by mimicking it.

Mammals that can imitate sounds are rare outside of humans, and this ability is not common in human societies.

important for the development of music and language

It makes me wonder why non-human mammals would do such a thing.

I've spent most of my research life studying how marine mammals use learning to communicate and how they change their responses based on what they hear.

Let's listen to the vocalizations of non-human primates

Many mammals have a "contact call" that they use when mother and child get separated.

Here's an example of a contact call used when a squirrel monkey mother and child get separated.

As you can see, there are very few individual differences.

By contrast, the "signature whistles" that dolphins use to communicate vary greatly from individual to individual.

The ability of dolphins to learn calls allows them to develop more complex and distinctive calls to distinguish between individuals.

Under what circumstances do dolphins use this call?

Let's take a look at the lives of mothers and children

In everyday life, it is not uncommon for mothers to get so caught up in chasing fish that they get lost.

This figure shows the ratio of signature whistles used to the maximum distance between dolphins.

At distances of 20 meters or less, we use vocalizations less than half as often.

Most of the time, they find each other while swimming around.

But beyond 100 meters apart, all mothers and cubs, without exception, use their own unique vocalizations to locate each other.

This distinctive signature whistle is mostly consistent throughout the dolphin's life.

but there are some exceptions

Male dolphins fledge from their mothers and sometimes join other male dolphins, and their partnerships can last for decades.

And once the dolphins have established a social bond, their unique vocalizations converge and become very similar.

This diagram shows the vocalizations of two birds paired together.

In the picture above, the two are called "Woop, whoop, whoop."

sharing an upward meow

On the other hand, in the figure below, it is a cry of "woooooooooooooooo"

What's going on? Dolphins use a learning process to develop cues that identify new social groups.

It's a very interesting way of forming new identifiers for new social groups.

Let's expand a little bit and explore what this information can teach us about protecting dolphins from human interference.

If you look at this picture, you can see that the dolphins are surrounded by boats and their movement is blocked.

it's a bad situation

But even if there is only one boat approaching the dolphin pod, when the boat is within a few hundred meters, the dolphins will start to vocalize, stop what they were doing, huddle up, wait patiently for the boat to pass by, and when they are gone, they will return to their original behavior.

In places like Sarasota, Florida, a ship passes 100 meters ahead of a pod of dolphins every six minutes on average, and that's a common sight.

It's probably a better situation than this picture, but it still affects the dolphin's daily life.

In pristine Western Australia, Lars Bider is working to compare the behavior and distribution of dolphins before and after dolphin watching began.

If you only have one ship, it doesn't matter much.

But when we got two ships, some of the dolphins left the area.

Even among the remaining dolphins, we've seen a decline in birth rates.

The presence of ships negatively affects the overall population.

In marine protected areas for dolphins and other animals, we have to be even more careful about what we do.

To avoid these problems, we may need to limit the number of pleasure boats and whale watching boats.

Also remember this: sound propagates regardless of boundaries.

You can draw boundaries to protect an area, but chemical pollution and noise continue to cross the boundary.

Now let's move from the local, familiar coastal environment to the baleen whale, which lives in the wider ocean.

It's a familiar world map

the world is mostly blue

Notice that the oceans are more connected than we think.

Compared to traveling on land, there are fewer obstacles to traveling under water.

There's a shocking experiment that shows that the ocean is continuous. An oceanographer went to the southern Indian Ocean and did an acoustic experiment by placing speakers in the ocean and reproducing sound.

The sound emitted from the speakers traveled west to Bermuda, off the east coast of the United States, and east to Monterey, California, where the same sound was heard.

We live in a world where satellites communicate with the rest of the world, but we still hear low-frequency sounds.

The global propagating nature of this ocean is truly astonishing.

Each path takes about 3 hours for sound to travel.

It's almost halfway around the earth

In the early '70s, ocean acoustician Roger Payne published a theoretical paper that suggested that sound could travel over such a wide range, but many biologists didn't believe it.

Humans only learned this fact a few decades ago, but whales have spent tens of millions of years evolving ways to harness the amazing properties of the ocean.

Blue and fin whales emit low-frequency sounds that can travel long distances.

Above is a series of complex vocalizations repeated by males.

Making songs is part of breeding, like birds singing.

Below you can see male and female calls, which are also fairly widespread.

Biologists were skeptical about the long-range communications of these whales, and this continued through the '70s until the end of the Cold War.

What turned it around is that during the Cold War, it was a secret at the time that the U.S. Navy had a system to track Russian submarines.

We had hydrophones in deep water that were connected to a cable that ran all the way to land, and at the base at the end of the cable, we could hear sounds from across the entire North Atlantic Ocean.

After the Berlin Wall came down, the Navy opened up the system to whale acousticians to see what they could hear.

This is from Chris Clark, and he's tracking a single blue whale that's passing through Bermuda, heading south to the latitudes of Miami, and back.

Tracking lasted for 43 days, over 1,700 kilometers, over 1,000 miles.

And what they found in this experiment was that their calls can travel hundreds of miles, and whales typically swim hundreds of miles.

Whales are large-scale sea animals that can communicate over long distances, much more than we expected.

Unlike blue and fin whales, which inhabit temperate and tropical waters, humpback whales concentrate in familiar, limited breeding habitats.

What you're hearing now is a complex song by a humpback whale.

As they develop their ability to sing, humpback whales listen to other whales and change their own songs based on what they hear, much like songbirds and mimic dolphins.

That's why humpback whale songs are a kind of culture, just like music is to humans.

A very interesting example of this was found in Australia.

A biologist on the east coast of Australia was recording humpback whale songs in the area.

This orange stick shows the typical song of an East Coast humpback whale.

In 1995 everyone had the same song

In 1996, a different song emerged, and this strange song was typical of West Coast whales.

The West Coast whale song was a big hit, it was being sung more and more, and by 1998 all the East Coast songs were gone in favor of cool new West Coast songs.

the whales began to sing

Just as a new trendy style completely wiped out the old fashioned style, and no station played oldies anymore.

Gone are the whales that sing nostalgia

I'm going to tell you about the role of the sea in these songs.

This sound was recorded by Chris Clark 0.2 miles away from a humpback whale.

I can hear all frequencies. It's very loud.

sounds very close

Now, the same humpback whale song, but recorded 50 miles away.

This one

I can only hear low frequency sounds

It's the reverberation of sound that has traveled a long way through the ocean.

After the humpback call, the blue whale call is played.

It's the voice of a blue whale 50 miles away, too far for a humpback whale.

This one sounds loud and clear

Here's the same voice recorded by a hydrophone 500 miles away.

Although there is a lot of noise from other whales

it sounds faint

Now let's consider the human impact.

Most of the human noise at sea comes from ships.

This is the sound of a ship. You have to raise your voice to hear it.

A whale listening for sounds 500 miles away

Just imagine, the sound of ships can disrupt whale-to-whale communication.

This problem has been known for quite some time

This figure is an excerpt from the Kaichuon text

The y-axis is the average deep-sea ambient noise volume, and the x-axis is frequency.

And this line in the lower frequencies is the sound of earth's seismic activity.

Those lines in the high frequency band are the noise from the wind and waves from above, which is amplified in this frequency band.

The frequencies in between, which are normally audible, are filled with the noise of human ships.

Think about it, it's amazing, because in this frequency range that whales communicate with, it's the human ships that are the main source of noise globally, the collective sound of thousands of human ships over vast distances.

In the next slide, I'll show you the effect of ship noise on whale communication range.

This is the loudness of a whale cry

The farther you go, the quieter the sound becomes.

In pre-industrial oceans, this whale call was easily detectable.

Because even at 1,000 kilometers away, the call was louder than the noise.

Let's add to this the noise that ships make.

And then the range that we could communicate with was suddenly reduced from 1,000 kilometers to 10 kilometers.

If widely dispersed males and females use this signal to find mates, think about the impact this could have on the survival of endangered species.

Whales also use contact calling, just like dolphins.

Now play back the contact call sounds that right whales use to communicate.

This call is used to find each other when mother and child are separated.

What if there is ship noise there?

What do you think the mother whale will do if a ship comes when she is separated from her cub?

Explain Mother's Strategy

If the mother dolphin's call is in the lower frequency band, and the noise is in the overlapping band, the call will be raised to move it out of the noise band, and the communication will work.

Susan Parks of Pennsylvania State University is doing this research.

This is data for the South Atlantic.

It's a typical contact call in the 70's.

In 2000, the average contact call looked like this

It's the same in the North Atlantic in the '50s and 2000.

Here's a 50-year comparison: The worse the man-made noise in the ocean, the louder the whales have to sing.

It's like all the whales switched from bass to tenor.

It's an astonishing human-induced change on a large scale in both time and space.

We found that whales either make their voices louder, like we did with the ship's sound earlier, or wait for it to quiet down, or shift the sound out of the noise frequency band to compensate for the noise.

Screaming loudly and changing pitches can be costly, and opportunities can be missed.

While waiting for silence, we may miss a crucial opportunity to communicate.

We need to be concerned about animals, how noise can degrade their habitats, how much they pay for noise, and how they might be unable to perform important behaviors.

it's a very important issue

The good news is that we're making encouraging progress in addressing the impact of ships on whales.

The United Nations' International Maritime Organization formed an organization to set guidelines for quieting ships, to show industry how to reduce noise on ships.

And we've already found that we can reduce the noise by 90 percent by adjusting the screw design.

And by soundproofing the power plant and isolating it from the hull, the noise can be reduced by 99 percent.

Whether or not to include it is a matter of cost and standards.

If this organization creates standards for ships, and if the shipbuilding industry builds ships to standards, then little by little the potential problems will go away.

But there's still another problem, the collision problem.

This whale narrowly avoided a collision with a fast-moving container ship.

Collision issues are serious

Endangered whales die every year in collisions with ships, and it's very important to reduce these incidents.

I'll tell you about two possible ways to deal with this problem.

The first is the Bay of Fundy case

These black lines are the shipping lanes in and out of the Bay of Fundy.

Colored areas indicate areas where boats are at risk of colliding with endangered right whales along the route.

This route overlaps with feeding grounds that right whales use during the summer, which increases the risk of collisions.

Unable to ignore this fact, biologists went to the International Maritime Organization and filed a petition, "Could you move the route?

It's passing through an important place. Can you move it to a less risky place? ”

The International Maritime Organization responded emphatically, "This is the new route."

route has been moved

As you can see, the risk of collision has decreased.

You can actually expect results

We can creatively think of different ways to avoid risk.

I would like to introduce another voluntary action by the transportation companies themselves, which was originally taken in consideration of the greenhouse gas emissions associated with global warming.

Maersk Line looked at its competitors and realized that in the shipbuilding industry, time is of the essence.

The ship will go to its destination as fast as possible.

When you arrive, you usually have to wait.

So they devised ways to slow down

Succeeded in reducing speed by 50%

We cut our fuel consumption by 30 percent, so we saved a lot of money, and at the same time benefited the whales.

If you slow down, you'll make less noise and reduce the risk of collisions.

So in summary, I'd like to say that whales live in an amazing world of sounds, and they're using the ocean's acoustic environment.

It has evolved over tens of millions of years to make use of it.

We need to seriously consider the possibility that our actions are unknowingly interfering with activities that are vitally important to them.

At the same time, we need to be creative and look for solutions to alleviate various problems.

I think the examples we've seen so far show that there are many ways that we can go beyond protected areas. Let's all work together to protect marine environments where whales can communicate safely.

Thank you

(applause)

I'm probably the dumbest person in the room.I didn't even finish school.

But what I knew from an early age was that I loved money and business and entrepreneurship.

And I was raised as an entrepreneur at home.

I've been obsessed with this ever since I was a little girl... I hadn't told anyone about this until recently, and apart from my wife, you're the first person to hear this story. Three days ago, my wife asked me, "What are you going to talk about at TED?"

So what I said is that we don't have the opportunity to find and train kids with entrepreneurial qualities and teach them that being an entrepreneur is great.

Entrepreneurs are neither bad nor demeaning, but they are treated as such in many societies.

Children grow up with dreams, they have passions and they have visions, but at some point they get crushed.

And they tell me to study harder, to concentrate, or to learn from my tutor.

My parents gave me a French teacher, but I'm still not good at French.

Two years ago, I was named the highest rated lecturer in the Entrepreneurship Masters Program at MIT.

It was at an event where I spoke to entrepreneurs from all over the world, and in my sophomore year, I won the city's speech contest.

But no one said, "This kid's a good speaker

I don't say, "I'm restless, but I'm active, and I'll share my energy with everyone."

We don't say, "Let's get a speech teacher."

Instead, I made him learn something completely useless.

Children exhibit these qualities, and we need to be aware, and I think we should raise our children to be entrepreneurs rather than lawyers.

But the school system for education says, "Let's be a lawyer," or "Let's be a doctor."

No one says, "Let's be an entrepreneur," and we're missing out on opportunities.

Entrepreneurs, and there are a lot of them in this room, are people with ideas and passions who see a need in the world and stand up and try to solve it.

And someone who tries to achieve something while taking various risks.

And it has the power to attract people who want to make their dreams come true together.

I believe that if children had been encouraged to become entrepreneurs from an early age, all the problems in the world today would be different.

Because for every problem someone has an idea.

I can't tell anyone that a little kid can't do that, it's just that I'm stupid and didn't understand.

We have an obligation as parents and as a society. Instead of giving our children fish, we should start teaching them how to fish.

What if you could teach kids how to be entrepreneurs? To kids who have that quality, just as we guide kids who are scientifically gifted into science, to kids who show entrepreneurial qualities, we teach them how to be entrepreneurs instead of waiting for government handouts.

We might start a company We teach our kids what they shouldn't do in the classroom

Do not hit, do not bite, do not use foul language

What we teach our children is how to get a good job, and the school system encourages them to become doctors, lawyers, accountants, dentists, teachers, pilots.

And the media say it's cool to be a model, a singer, an athlete like Sidney Crosby.

MBA programs don't teach you how to be an entrepreneur

The reason I didn't pursue an MBA -- aside from having a high school average of 61, the only college I could get into in Canada -- like Carlton -- was because an MBA program doesn't teach you how to be an entrepreneur.

An MBA teaches you how to work in a company.

Who will start the company? a handful of miscellaneous people

Even in the literary world, as far as I know, and I'm sure you've read this book, the only book in which entrepreneurs are portrayed as heroes is "Atlas Shrugged."

He's portrayed as a villain, speaking of my own family.

Both of my grandfathers were entrepreneurs, and my father was also an entrepreneur.

All three brothers have companies

And the reason we started the business was because it was the only place that fit us.

Stubbornness and other qualities have prevented us from working for others.

Even such a child can become an entrepreneur.

I belong to two global organizations, the Entrepreneurship Organization and the YPO (Young Executives Network).I was just in Barcelona.

I just got back from speaking at the YPO World Congress

All the people I met there were entrepreneurs who struggled in school.

I was diagnosed with 18 of 19 symptoms of Attention Deficit Disorder

I shudder to see this

(Laughter) Maybe that's what's causing the panic right now, apart from the heavy caffeine and sugar.

It's really horrifying for entrepreneur types.

Attention Deficit Disorder and Manic Depression

Did you know that manic-depressive disorder is nicknamed "the CEO's disease"?

So is Ted Turner, so is Steve Jobs.

All three Netscape founders

Any number of examples can be given

When children show such symptoms

What we do is put them on Ritalin and say, "Don't be the entrepreneurial type."

"Become a good student according to your surroundings"

Entrepreneurs are not good students Find tricks and beat the game

Cheat on report plagiarism

I was paying other students to do my college accounting homework 13 times in a row.

Entrepreneurs hire accountants instead of doing their own accounting

So it's just that I did it early.

(Laughter) (Applause) I can tell you that I cheated in college, but you don't.

And then again, what I told textbook authors is now in textbooks used in colleges and universities across Canada, at the beginning of Chapter 8 of Management Accounting.

I'm talking about budgeting

After an interview, I told him that I was cheating in that very class, and the author apparently thought it was too funny to cut.

I see signs of that in children.

An entrepreneur is defined as "a person who organizes and operates a venture with an understanding of the risks."

You don't have to have an MBA.

People often ask me if it's talent or environment.

1 or 2? Which one?

The answer is both, not which.

I was raised as an entrepreneur

When I was a kid, I didn't have a choice, because it was instilled in me from a very early age. When my father realized that I wasn't good at what I was teaching in school, he decided to teach me business.

My father raised all three of my brothers and sisters to be people who hated jobs and wanted to start their own companies and hire people. My first business was in Winnipeg when I was seven years old.

I pulled long extension cords into my room and called every dry cleaner around town asking how much they would give me for a hanger.

My mother came into the room and asked, "Where are you going to get the hangers from?"

I said, "Come down to the basement."

I went down and opened the closet

There were about a thousand hangers that I had collected, and while I said I was going out with the other kids, I would go around the neighborhood collecting hangers and hoard them in the basement to sell, because I learned a few weeks ago that they could be turned into money.

I had a lot of hangers, so I thought I'd collect them.

I learned during this time that things can be negotiated.

I got someone who said 3 cents to raise it to 3.5 cents.

At seven years old, I also knew that I could put a decimal price on it, and if I multiplied it by that many times, I could still pay for it.

A 7-year-old figured it out, sold 1,000 hangers for 3.5 cents each.

Sold door to door license plate covers

who my father will sell it to

They made me look for it, when I was nine years old, and walked around the town of Sudbury.

I went door to door selling license plate covers, and I remember one customer very well.

I sold other things, I sold newspapers, but he had never bought a newspaper from me.

So I was determined to sell license plate covers no matter what.

He said, "You don't need it," and I said, "But you have two cars, right?"

"I have two cars and they don't have license plate covers."

he said "I know"

"This plate is crumpled."

"Oh, it's my wife's." "Then just put it on your wife's car."

Why don't you try it to see if it lasts longer? ”

There are two trucks, each with two license plates.

I learned when I was a kid that even if you can't get four, you might be able to buy just one.

I also took out the sheath of the comic

When I was 10 years old, I was selling comic books in my vacation home on the Bay of Georgia.

I rode my bike to one side of the beach and bought a comic book from a poor kid, then I went to the other side of the beach and sold it to a rich kid.

It was a no-brainer for me Buy low, sell high

Find someone who has the money and the demand. Sell it to the rich kid and get the money instead of the poor kid with no money.

it was normal for me

It was a bad time

Even in a recession, there's $13 trillion in the US economy.

There's a place to make money, I learned that when I was a kid

I also learned to keep my sources private, and after about four weeks of doing that, a rich kid found out where I got my comics from, and I was ripped apart.

I really didn't want to

My father told me, "This is the next business I'm going to do."

Instead of just one person, I asked them to take on the work of two people and hire someone else to do the half.

Money comes when you collect chips

so i decided to collect the chips

collect all the money

My partner only delivers newspapers

I realized that I could make money doing that.

At this point, the possibility of me becoming an employee of any company has disappeared.

(Laughter) My father had an auto body shop.

Old car parts were scattered

There were brass and copper scraps

And when I ask what they do with it, they say throw it away.

"Maybe someone will pay for it." "I don't know." Remember when I was 10?

Thirty-four years ago, I saw the potential, I saw the money in the trash.

I collected junk from auto factories within biking distance.

I got my dad to drive me to the scrap metal collector on Saturday, and I cashed in. I thought it was really cool.

Strangely, 30 years later we say 1-800-GOT-JUNK?

I decided to start a junk collection company.

When I was 11, I was a Cub Scout for Mother's Day.

I made a little pincushion, using a wooden clothespin to hold the laundry on the clothesline.

shaped like a chair

I made a little prick

You can insert a sewing needle

Back in the day, everyone used to sew and use a needle stick.

What I realized is that you need options. So I made a bunch of them painted brown. Instead of saying, "Would you like one?"

Never say no to a 10 year old

Especially when you have two options, you can choose brown or white. I learned this lesson early on.

I learned that manual labor sucks

mowing the lawn is hard work

All summer long, I was getting paid to mow my neighbor's lawn, and then I realized that the recurring income I could get from one customer was amazing. Once you got a customer, you could make money from that person every week.

I learned at a young age that recurring income is great.

I was raised that way I can't be a hired man

I was going to go to a golf course and caddy, and there was a big hill on the 13th hole, and people were having a hard time carrying their golf bags, and I sat there on a folding chair.

I carried a bag for someone who didn't have a caddy Carry the bag upstairs and get a dollar

My friend, on the other hand, spent five hours carrying someone else's bag and got $10.

you should find a way to get money faster

Every week, I would go to the corner store and stock up on juices to deliver to the 70-year-old grannies who were playing bridge.

After that, I started getting orders every week, and I delivered the juice and sold it for double the price.

You've conquered the market. No contracts needed.

You just have to have supply and demand and customers who like you.

They liked me, so I knew they wouldn't buy it anywhere else. I picked up balls on the golf course.

Everyone else looks in bushes and ditches, I outsmarted them.

All the balls were in the pond, but no one was in the pond.

So I went into the pond and picked the ball up with my toes, using both feet.

I can't do it on stage

When I found the ball, I shoved it into the trunks of my bathing suit, and by the time I finished, I had accumulated 200 balls.

The problem is that people don't want old golf balls.

So I made a package, when I was 12 years old, and I had three different packages.

Like "Pinnacle" or "DDH"

Top notch products of the time sold for $2 each.

And I got the pretty ones for 50 cents each.

The dirty one is for practice

Sold as a set of 50

When I was in middle school, I sold sunglasses to everyone in school, because they were always trying to take money from all my friends.

I was scared of smoke

I made money

I sold a lot of sunglasses

Then I was banned from school. They called me into the staff room and told me to stop.

I got the market, I think it was when I was 14.

First year tuition at Carleton University

Earned money by selling wine skins

Holds a 40 oz bottle of rum or two bottles of Coke. Do you know what it's used for?

If you can hide it in your trousers

People bought it for me because I could have a free drinking party at the football game.

Supply and demand Big opportunities

I'm also trying to brand

I sold it for five times the price with the college logo on it instead of buying games for my kids.

Why don't we give kids who have entrepreneurial aptitude a game that will help them develop their talents?

Teach me not to waste money

I remember in Banff when they told me to go to the middle of the road because I threw a penny in the road.

My father said, "Pick it up."

"It's hard-earned money, don't waste a single penny."

Pocket money gives children bad habits

What is pocket money

You will be taught to be a hired worker

Entrepreneurs shouldn't expect regular income

Pocket money encourages children to expect regular income from an early age.

If you want to grow entrepreneurs, this is wrong.

I have a nine-year-old and a seven-year-old, and I teach them to look around the house and the yard and see if there's something they can do, and when they do, they come to me and tell me.

Or sometimes I say, "I want you to do this."

What do you think you'll do then? price negotiation

Children understand what the job entails and negotiate how much it will cost them.

They don't have a regular income, but they have a lot of opportunities to find jobs, they're learning negotiation skills, they're learning opportunity-finding skills.

We develop that ability. Children have two piggy banks.

of money earned or received

Put half in the home account and half in the toy account

You can spend the money in your toy account however you like.

The money in the home account goes to the bank together every six months.

Then every year I deposit the bank money with a stockbroker.

Children aged 9 and 7 are already investing in stocks.

That's how you get them into the habit of saving. When a 30-year-old says, "It's about time I started thinking about my pension."

I feel like I'm going crazy when I hear you say things like

what have you been doing for 25 years

Those habits can be taught in early childhood, before they start feeling anxious.

Don't read a story to your child every night, just read a story four days a week, and let them tell a story three days a week.

For example, I pick up a red shirt, a blue tie, a kangaroo, and a laptop, and have them compose a story with those four things in it. My kids do this all the time.

You can learn to sell, you can learn to create, you can learn to think for yourself.

You can do that while having fun.

Get your kids to do public speaking, whether it's doing a play or giving a speech in front of their friends.

What bad customer service and bad employees teach

It's about pointing out an unfriendly employee.

If you encounter bad customer service

Teach them, "This is an example of a bad employee." Then say, "This is an example of a good employee."

(Laughter) If you go to a restaurant and the service is bad, I can tell you about the bad customer service.

With so many lessons in front of them, people don't take advantage of the opportunity, instead tutoring them.

Let's collect the two-year-old junk that the kids no longer need in the house when they're grown up and say, "Would you like to sell this on Craigslist or Pheasant?"

Selling experience teaches you how to spot scammers when they receive an email

How to set a price How to estimate a price

Learn how to upload photos

We teach them how to do that, how to make money, and when they do get money, 50% goes into their home account.

50% goes into toy bank Kids love to do that

Entrepreneurial qualities that should be nurtured in children include achievement, tenacity, leadership, self-reflection, interdependence, and values.

These qualities are found in young children, and we can help them develop them.

Be careful with those things and don't break them

There are qualities I want you to pay attention to

Please don't drug a child with attention deficit disorder, unless it's absolutely terrible. (Applause)

So are mania, nervousness, and depression, as long as the symptoms aren't too severe.

Manic depression has been dubbed the "CEO's disease" Steve Jarveson, Jim Clark,

Jim Barksdale, they're all manic-depressive, but they built Netscape.

Al Gore may have really created the internet

(Laughter) Entrepreneurship skills, like everything else, should be taught in the classroom.

I'm not saying don't turn your kids into lawyers.

It's just that entrepreneurs want to be treated like anything else, because there's so much potential out there.

I would like to conclude by showing you a short video at the end.

It's a video made by the company I advise.

It's a company called Grasshopper.

The theme is children and entrepreneurs

I hope this inspires you to take what you've heard from me and do something that will change the world.

When you were a kid... did you think you could do anything? You can still do it.A lot of the things you think are impossible are actually easy to overcome.You may not realize it, but we live in a world where one person can make a difference.Want some proof? The people who built this country, parents, grandparents, uncles, aunts, they were immigrants, newcomers trying to make their mark They came in with very little and maybe they had only one thing - a brilliant idea They were called thinkers, doers, innovators Well, until they found the right name... Entrepreneurs! They change everyone's perception of what's possible Show them a vision that life can be better For everyone, even in the toughest of times... Right now, visibility is poor and visibility is obstructed Social turmoil also creates opportunities There are opportunities for success and achievement And they push you to find new ways of doing things For what and what opportunities are you chasing? If you're an entrepreneur, you know that what you're looking for isn't risk. What you're looking for is to drive innovation, to change people's lives, to create jobs, to be a force for growth, and to create a better world. Anyone can be an entrepreneur, even you! Seize the opportunity to create the job you've always wanted Let's help the economy heal Let's make a difference Take your job to new heights But most importantly - Remember when you were a kid Remember when everything was within your reach

(music) [Sanskrit] This is a lyric song of the mother goddess. In India, we learn this song in childhood.

I learned from my mother when I was four years old

That same year, I started taking dance lessons from my mother, and I've been doing classical dance ever since.

It's been about 40 years since then, and I've been blessed with wonderful teachers, performed dances all over the world, taught dance to people of all ages, worked on creations and collaborations, choreographed, and became a leading dancer both in name and reality.

Most memorable was winning Padma Shri, India's fourth highest honor, in 2007.

(Applause) And yet, on July 1, 2008, I was completely unprepared to receive a certain sentence.

I heard the word malignant tumor

it was breast cancer

I was speechless in front of the doctor. Other words I heard were "cancer," "stage," and "grade."

When I said "cancer," I thought of Cancer. I thought "stage" was about performing on stage, and "grade" was about grades in school.

The day I was sentenced, I knew that I had an uninvited guest inside of me.

As a dancer, I have learned to express nine emotions: anger, courage, disgust, laughter and fear.

on the date of notification

I learned the true meaning of fear

I kept crying because of the gravity of the situation and the helplessness I had with cancer. I asked my husband.

"I wonder if this is the end

I wonder if it will end as a dancer.”

My husband was positive and said, "No, this is temporary. Rest, get treatment and you'll be back."

I thought I was in control of my life, but then I realized that I could only control three things: my thoughts and my mind, the images my thoughts and minds create and the movements I make out of them.

I was overwhelmed by the magnitude of the situation, and I was overwhelmed with emotions.

I didn't accept myself for who I was, and I wanted to be who I wanted to be.

I needed some inspiration

Stop crying, one day I declared

Cancer is a small part of life and cannot be allowed to affect the rest of one's life.

And I've beaten cancer, and I've declared that I won't lose to cancer.

But I needed something to get me out of the situation.

I had to get out of this situation with a credible image, a crutch.

I found that support in dance, my dance, strength, energy, passion, expression of life.

but it is

it was really difficult

Can you be cheerful when you lose your hair in three days from your beauty?

How can I not despair when the side effects of chemotherapy make even climbing stairs painful, when I used to be able to dance for three hours?

How can you not despair and feel miserable in a situation like this?

I wanted to bend over and cry

I told myself not to give in to fear and tears

I dragged myself into the dance studio and gave my whole body and soul and relearned everything I learned when I was four.

It was very painful, but I made it through.

It was painful

I focused my attention on the mudras, the way I used my hands to express myself, the imagery of my dance, the emotional expression of my dance, my outlook on life.

And gradually I came out of my sorrow

But to take another step forward

I was looking for something else, and one day when I was four years old, my mother taught me

Reminds me of Mahishasura Mardini's Durga

Durga is a fearless mother goddess created by the Hindu gods.

Durga is brilliant and beautiful and has 18 arms and with them he fights, riding on a lion and going to attack Mahishasura.

Durga symbolizes the strength of the woman called Shakti.

Fearless Durga

I imagined her and expressed her personality and emotions in my own way.

The power of mythology and my passion for training made me more focused on dance, and how focused I was, I started dancing a few weeks after my surgery.

I danced through chemo and radiation, and my doctor was stunned.

I asked my doctor to coordinate my treatment with my dance schedule.

I turned from cancer to dance

cancer is just part of my life

My message is to overcome the obstacles and difficulties that life throws at you.

What I want to tell you is the power of thought

power of your choice

power to focus

And if you have the power to lift yourself up, you'll be able to move forward, and even cancer won't be a big deal.

I express the power of symbols

It's the power of the imagination, so to speak.

I express Durga Durga knows no fear

Durga, also called Sihanandini, rides a lion

I am also riding a lion, building up my inner strength and resilience, taking medicine, staying in treatment, fighting cancer, and telling cancer cells to be gentle. And I want to be a cancer survivor, not a cancer survivor.

We will perform a dance that expresses that state.The title is "Sinhanandini".

(applause) (music) (applause)

Let's talk truth about leadership in the 21st century.

It's something to think about in this century - remember, folks. You learned to “measure” when you were in elementary school.

what we should be thinking about now

"What" do you measure? That's the point.

First of all, I would like to introduce

Van Quash.

Immigrated to the United States from Vietnam in 1986.

Renamed Vivian. I wanted to blend in with America.

I started working as a maid at a small hotel in San Francisco.

Three months later, I bought the hotel.

I have known Vivian for 23 years.

At the age of 26, I founded a company called Joie de Vivre in 1987, with the youth and idealism in my heart. It's a difficult name to call, but I wanted to create "Joy of Life".

The first hotel I bought was an hourly love hotel. It was in downtown San Francisco.

I noticed it while watching Vivian. She finds “the joy of living” in her work.

I wondered. How can I find joy in cleaning toilets?

Then I understood. There was no reason to rejoice.

Vivian's goal and mission is not to become the world's best toilet polisher.

What was really important to her was the interaction with colleagues and guests.

The fact that I was helping people in a strange land gave my work meaning.

She herself lived in a foreign country.

It's been 20 years now, but what I learned from Vivian has helped me through the last few years of economic stagnation.

The 9/11 terrorist attacks and the bursting of the tech bubble slashed hotel revenues in San Francisco and the Bay Area to levels unprecedented in the history of the industry.

It was particularly hard hit while I was managing the largest hotel in the Bay Area.

Besides, Americans stopped eating French fries around that time.

I was actually eating.

Call it "Freedom Fly". A boycott of French products has also begun.

Our company name is French. Letters are coming. From Alabama or Orange County. Boycott our hotel. I thought it was a French company.

So I wrote a reply.

"We are a company in San Francisco."

The answer is one word, "It's even worse."

(Laughter) Then one day, feeling down and feeling no joie de vivre, I stopped by the bookstore near my office.

At first, I was in the business book corner. Since I was looking for a work solution.

However, with a confused mind, I found myself in the self-help book corner.

It was there that I reunited with Maslow's Hierarchy of Needs.

I took one psychology class in college and learned about Abraham Maslow. His hierarchy of needs is well known.

That afternoon, I sat in a bookstore for four hours, and I read Maslow, and what I read was the truth about leadership.

There is a simple fact that is often overlooked in business. that we are all human.

Every worker, regardless of their job title, has a hierarchy of needs.

I read a lot of Maslow's books, and I learned later in life that he was trying to apply the hierarchy of needs from the individual level to the collective level. to organizations, especially business relationships.

Unfortunately, he died early, so he could not fulfill his dream until the end.

I thought it was my role to carry on Maslow's will.

It was several years ago now. The hierarchy of needs for self-transformation was devised according to Maslow's hierarchy of needs. There are three stages: survival, success, and self-transformation.

Not just in business, but in life in general.

Then I looked at my own company. How are we responding to the higher desires of our core employees, their desire for self-transformation?

The three levels of the self-transformation hierarchy of needs correspond to the five levels of Maslow's hierarchy of needs.

However, when reviewing our company regarding the desire for self-transformation of employees and customers, the problem was that there was no clear measurement standard.

There is absolutely nothing to measure.

So I'm asking myself again. What metric, without being overt, can measure our employees' sense of meaning in their work and our emotional connection with our customers?

So I asked the employees. Do you know the company's philosophy? Do you believe in that philosophy? Do you feel that your work contributes to the realization of your philosophy?

And we asked our customers. Give seven examples of whether you feel an emotional connection with us.

And I got great results. Focusing on higher needs led to stronger loyalty.

Dramatically increased repeater rate

Our turnover rate has dropped to one-third of the industry average. In five years when the IT industry suffered from a slump, our company tripled its business expansion.

At the time, when I met other business leaders, I asked them how they were coping through the recession. Many of them focused only on what they could "measure".

What is "measurable" is what can be seen with the naked eye.

I didn't even notice the invisible part above the hierarchy.

To convey the importance of invisible things I thought about what to do.

When leaders manage only the "measurable" and only think about the visible, the upper part of the hierarchy of needs is ignored.

After doing some research, I found a research result. 94% of global business leaders believe that the invisible is important in business. For example, intellectual property, company culture, and brand loyalty. But only 5% of them had the means to "measure" it.

In other words, we leaders know the importance of the invisible, but we don't know the criteria to measure it.

Einstein said. “Not only things that can be measured are important, but there are things that cannot be measured”

I don't want to argue with Einstein, but if the things that matter most in life and business are "unmeasurable," will our standards of life always be mediocre?

That question prompted me to take a week off from my job as CEO and travel to the top of the Himalayas.

A place shrouded in mystery for centuries Also known as Shangri-La.

From the bottom of the hierarchy of needs, he achieved self-transformation and became a role model for the nations of the world.

I visited Bhutan.

The king, still in his teens, was an interesting figure. It was 1972 and he had just inherited the throne after losing his father two days earlier.

The questions the 17-year-old had were still fresh.

Shortly after I took the throne, I visited India and was asked by an Indian reporter what the gross domestic product of Bhutan was.

The king's answer at that time changed us 40 years later.

“Why are you so particular about national production?

Shouldn't the happiness of the country be more important than that? 』

So what the King was advocating was a new definition of success. It is now called GNH (Gross National Happiness).

At the time, most countries either didn't care or thought it was simply "Buddhist economic thinking."

But the king was serious.

It was a historic moment. For the first time in 200 years, a leader of a nation has spoken out about invisible happiness -- 200 years ago was Thomas Jefferson's American Declaration of Independence, but 200 years later the King of Bhutan argued that government should not be concerned with invisible happiness.

After that, for 36 years, the King actually began to measure and manage the happiness of the country. In recent years, Bhutan has transitioned from an absolute monarchy to a constitutional monarchy. without shedding any blood.

As you may know, Bhutan became a democracy only two years ago.

As I met with the leaders of the GNH movement, I began to understand more and more.

There is also an opportunity to speak with the former king's prime minister

at the dinner table

I asked a cheeky question. ``How can you produce and measure something like happiness that will disappear someday? 』

The wise prime minister replied. "Our goal is not to produce happiness,

To create an environment that facilitates happiness.

In other words, create a happy home.”

Very interesting idea.

It seems that scientific analysis is being done, and it seems that GNH is measured using 4 essentials and 9 key indicators and 72 metrics.

One of the key indicators is how people feel about how they spend their time in the day.

Good question. How do you feel?

Time is a scarce resource in modern society.

Nevertheless, the invisible data of "time" is not included in the calculation of gross domestic product.

After a week in the Himalayas, I came up with the Emotional Equation.

It's based on a book I read a long time ago by a rabbi named Hyman Schachter.

Anyone know?

I wrote about it in a book I wrote in 1954 called The Joy of Living. Happiness is not getting what you want, but being content with what you already have.

In other words, for the people of Bhutan, happiness means being satisfied with what you have, that is, gratitude as the numerator and getting what you want, that is, satisfaction as the denominator.

They don't drive themselves by thinking all the time about what they lack.

Religious views, isolation from the outside world, deep respect for one's own culture, and the principles of the current GNH movement. All fostered an appreciation for what they had.

How many people in the audience spend their time thinking about the denominator of this equation?

We live in a "big-ass" culture. In many ways.

(Laughter) In fact, Western culture often focuses on the pursuit of happiness. As if happiness is something that must be chased and caught.

If you look it up in the dictionary, the definition of "pursuit" is "to pursue with hostility."

Are we chasing happiness with animosity?

Now back to Bhutan

The combined population of the countries north and south of Bhutan accounts for 38% of the world population.

Like the ventures in old industries, this country could be the catalyst for transforming the Chinese and Indian middle classes in the 21st century.

In fact, Bhutan has spread something important to the world. A new global currency that measures happiness. 40 countries are now studying their own GNH.

As you may know, last fall, French President Nicolas Sarkozy announced the results of a year-and-a-half study by two Nobel Prize-winning economists on the health and well-being of the French.

Sarkozy suggested that world leaders should come up with a new metric instead of just worrying about gross domestic product. In France, it is called the joie de vivre index.

Same as our company.

This is an opportunity for a brand partnership.

And just three days ago, at TED, David Cameron gave a simulcast talk. He is said to be a candidate for the next British prime minister, but he quoted my favorite speech. In a speech by Robert Kennedy in 1968, it was the part where we were so preoccupied with the short term that Gross Domestic Product was a irrelevant metric.

I feel that the world is changing.

Based on the words of Robert Kennedy I made a little balance sheet.

Here is a collection of what Kennedy mentioned in his speech.

Measures of gross domestic product include everything from air pollution to deforestation.

However, it does not include the health of children or the humanity of bureaucrats.

Looking at these two tables, what do you think? So what we need now is a new metric, shouldn't we start thinking about what's important in life?

(Applause) Kennedy said at the end of his speech.

“Gross Domestic Product is a simple representation of the whole country. Everything but what makes life worthwhile. 』

Absolutely.

So what should we do?

For example, you can do one thing. 10 years from now, even just in this country.

It's census time, but why the hell is this happening?

spend 10 billion dollars

10 simple and clear questions. that's all.

All questions are about what you can see.

About demographics.

where and how many people live Own a home or rent?

That's the extent of the question.

meaningful

Don't ask about anything important.

There are no questions about the invisible.

Maslow once said. You may have heard of it too.

"If your only tool is a hammer, everything will look like a nail."

I have been deceived by the "things" I have.

It's a crude way of saying it.

(laughter) I've been fooled by the "tools."

Gross domestic product with a “hammer”

The model of success seen from the perspective of industrial development in the 19th and 20th centuries was the nail.

But 64% of the world's total output today is the invisible: services. It's the industry I work in.

Only 36% are visible. manufacturing or agriculture.

I need a bigger toolbox.

With that toolbox, we can measure not only the things we can see, which are easy to measure, but also the things we care most about, the things we can't see.

I think I'm a different kind of CEO.

It was the same when I was an economics student.

Economists have learned to use visible production and consumption units to measure anything. As if all the "units" were the same.

It can't be.

What we should think about is that we leaders can change the quality of manufacturing units. To that end, we need to create an environment in which employees can feel a sense of mission.

For Vivian, for example, her unit of production was not an observable "hourly rate." What was more important was what I could do for my customers during that hour.

His name is Dave Arrindale. A regular at the hotel where Vivian works.

I have stayed hundreds of times over the last 20 years. Vivian and other employees made Dave a regular at the hotel.

for he created his "happiness abode".

Dave told me, "I feel so at home here because of Vivian and the others."

Why are business leaders and investors ignorant? By creating invisible employee happiness, visible financial benefits are also created.

Employee engagement and company profits are not mutually exclusive, they can be both.

In fact, motivated employees will pay off.

I think what the world needs right now is political and business leaders who know what to measure.

We need numbers.

And we need people.

Using numbers to truly value people is the most important thing.

I learned it from a motel maid and a king.

What will you start measuring today?

What do you think gives your life meaning, business or otherwise?

thank you very much.

(applause)

This is me, Ben Saunders

I specialize in dragging heavy loads back and forth between cold places.

On May 11th of last year, I reached the North Pole alone.

I was the only person on 5,500 square miles of land 1.5 times the size of America.

Over 2000 people have climbed Mount Everest

12 people have landed on the moon

Only four people, including myself, have reached the North Pole by skiing alone.

The reason is (Applause) Thank you -- the reason is, well, as Chris puts it, it's crazy.

This journey truly tests the limits of human ability.

I skied as far as running 31 marathons in a row. 800 miles in 10 weeks

I brought all the food, supplies, equipment, and sleeping bags I needed.I spent nearly three months with only one change of underwear.

(Laughter) In the remaining 16 minutes or so, I'd like to answer three questions. The first question is "why?"

Next, how to use the toilet in a world of minus 40 degrees.

"Ben, if you expose your skin in a world of minus 40 degrees, you'll get frostbite in less than a minute, so how do you go to the bathroom?"

I don't want to answer now. be last

Third, how did you do it and what are you going to do next?

It all started in 2001

My first expedition was with an experienced guy named Pen Hadow.

It was like a polar apprenticeship for me.

I was going to ski from the Severnaya Zemlya archipelago here to the North Pole.

I was drawn to the North Pole because it's in the middle of the ocean.

This is what the map looks like, but to get there, you have to literally ski across frozen terrain, a floating ice sheet in the Arctic Ocean.

talk to any expert

I read a lot of books and learned maps and charts.

But on my first day on the expedition, I realized that I had no idea what I was going to do.

I was 23 years old. No one at that age dares to do this. In a very short time, almost everything that could have gone wrong turned out to be so.

On the second day, I was attacked by a polar bear,

Frostbite on the big toe of the left foot,

Food started to run out. Both of us were hungry and our weight dropped off.

The weather was unpredictable and the ice conditions were unstable.

We obviously only had old-fashioned communication tools.

Satellite phones were too expensive, so I took a high-frequency radio

You can see the ski poles sticking out of the tent roof

Wires hanging from both ends

It's a high frequency radio antenna.

In two months, we had less than two hours of two-way communication with the outside world.

Finally, we ran out of time

We skied 400 miles and the North Pole was 200 miles away. But I ran out of time

It was summer and the ice was beginning to melt, and when I spoke to a Russian helicopter pilot over the radio, he said, "You guys, we don't have much time.

I have to pick you up."

I thought I had completely failed

I think I'm not good enough

I've dreamed of it for so long that I can't remember It was the only goal, but I couldn't even reach it

During that first ski run, I repeatedly pictured two images in my head to motivate myself when I was having a hard time moving on.

One is the moment we reach the North Pole.

I could clearly picture myself holding ski poles and a Union Jack while being filmed from a helicopter with what sounded like rock music blaring in the background.

I could see myself raising that flag at the North Pole - a moment of glory - with the music reaching its climax.

The other footage was of me returning to Heathrow Airport, and the cameras were flashing, and I could see clearly in my mind the paparazzi, the chasing fans, and the publisher's agents surrounding me.

Of course, neither of those things happened.

We hadn't been to the North Pole and had no money to promote it. So no one knew about this expedition.

When I got back to Heathrow, I had my mother and my brother, and my grandpa was there, and he had a little Union Jack.

I was physically exhausted, mentally exhausted, and thought I was a loser.

I was in a lot of debt for this expedition, and spent all day lying on my mom's couch watching daytime TV.

My brother texted me a cell phone text It was a quote from The Simpsons and said, "You tried your best and you failed miserably.

The lesson is, don't do that."

(Laughter) After three years, I finally got off the couch and started planning another expedition. This time, I wanted to go from Russia, at the top of the map, to the North Pole, at the twist in the middle, and then to Canada, all by myself.

No one has yet crossed the entire Atlantic Ocean solo

Two Norwegians teamed up to achieve it in 2000, but not alone.

A very famous and talented Italian climber, Reinhold Messner, tried in 1995 and was rescued a week later.

He said the expedition was ten times more dangerous than Mount Everest.

For some reason I wanted to try it, but I knew I would have to do something drastic to get back home, let alone cross the Atlantic to Canada.

We've done everything from crafting a pared-down two-gram toothbrush to working with one of the world's leading nutritionists to come up with an entirely new and innovative way to eat 6,000 calories a day from scratch.

The expedition began in February of last year

A solid support team. A film crew, a couple of logistics people, and my girlfriend and a photographer.

At first he was very sensible. I flew to Moscow with British Airways.

Next, I went to Krasnoyarsk in Siberia on a Russian domestic flight called Crash Air, written as K-R-A-S.

And then we chartered a very old Russian plane and flew to a city called Khatanga, which seemed to be the furthest reaches of civilization.

The cameraman turned out to be someone who is really worried about getting on a plane even when things are going well. Before he got on the plane, I asked the pilot how long the flight was. I wish I was alive

(Laughter) We got to Hatanga.

Interestingly, Hatanga isn't the end of the world, but you can see it from Hatanga.

(Laughter) I was only supposed to stay for one night, but I was stuck for ten days.

There was a raging squabble about fees between the helicopter's pilot and its owner, and we were stuck and unable to move.

On the morning of the eleventh day, everything was finally resolved, and I packed up the helicopter - flew two helicopters - and dropped me off on the crowded ice.

While the helicopter was there, I was in a rush for about 45 minutes of filming and photography, and then I was interviewed by satellite phone, and then everyone got in the helicopter, and when the doors closed, I was alone.

Words can't describe that moment

All I could think about was running back to the helicopter, banging on the door, and saying, "Listen guys, I can't do this."

(Laughter) Even worse, you'll see a white dot in the upper right corner of the screen. it's a full moon

It happened because I was stuck in Russia. The full moon is when the tides are at their maximum. And when you're on the surface of a frozen ocean, the tides mean something interesting happens -- the ice starts to move.

As you can see I was pulling two sleds

It had enough food and fuel for 95 days, and all together weighed 180 kilos and almost 400 pounds.

If the ice were flat, I could have managed to pull both.

If it wasn't flat, it would have been impossible

I had to pull one, put it down and go back to get the other one.

It was indeed overcoming undulating ice – the ice was being crushed under the forces of currents, winds and tides.

NASA said last year's ice conditions were the worst on record

And the pack ice is always floating

Of the 10 weeks I skied alone last year, nine were in headwinds, and most of the time I was drifting backwards.

The best record is falling 2.5 miles behind

I woke up in the morning, folded the tent, skied north for seven and a half hours, pitched the tent, and found myself 2.5 miles behind where I started.

I really couldn't keep up with the ice being washed away.

(Video): Day 22

I'm lying in my tent and getting ready to leave

Terrible weather washed away about five miles last night.

Later in the expedition, the problem is no longer the ice.

No ice – open water

I knew this was going to happen. because the Arctic is warming

I knew there would be more open water, so I had a secret weapon in my pocket.

this is my little biomimic

Arctic polar bears move in a straight line

When it reaches the sea, it jumps in and swims across.

So I was working with a team in Norway to develop a dry suit based on a life jacket that helicopter pilots would wear, and I could wear. The clothes cover your boots and gloves, and they cover your face and keep you well hidden.

So I could ski on very thin ice, and if I fell, it wasn't the end.

Even if the worst happened, I could have jumped in the ocean and swam and pulled a sled.

It was really radical technology, radical way of doing things, but it worked perfectly.

Another great thing we did last year was in communication technology.

In 1912, Shackleton's Endurance expedition had a sailor named Thomas Oudery.

"Explorers in 2012," he said, "if there's any place left to explore, they'll definitely take wireless handheld phones with wireless telescopes."

Audrey's predictions were missed by about eight years. This is my small cell phone, an Iridium satellite phone.

The radio telescope is a digital camera that I kept in my pocket.

Every day of the 72 days that I was alone on the ice, I wrote a blog from my tent, sending a little diary, information on how far I had covered, ice conditions, temperature, and daily photos.

Remember, in 2001 we didn't have radio contact with the outside world for two hours.

Last year, I blogged live from an expedition that was said to be ten times more dangerous than Everest.

It wasn't that high tech. This is navigating through a blizzard.

When there is fog or low clouds, the wind picks up snow

Then you lose your vision. I can barely see the yellow ribbon tied to my ski poles.

In such a case, use the direction of the wind to take the course

It's a strange combination of high tech and low tech.

We reached the North Pole on May 11th.

It took 68 days to get there from Russia, and there was nothing at the North Pole.

(laughter)

It doesn't even have a pole. It's nothing because it's sea ice. it's floating

Leave the flag there and it will soon start drifting, usually towards Canada or Greenland.

I knew that, but I expected something

There was a strange mixture of feelings: it was getting really hot by then, there was a lot of open water, and of course there was the euphoria of having made it all the way there, but I was also starting to realize that my chances of crossing all the way to Canada, 400 miles away, were slim by any stretch of the imagination.

The only evidence that I've made it to the North Pole is a blurry picture from a tiny satellite navigation tool called GPS.

Look, there's a string of 9's and 0's.

90 degrees north latitude - the very North Pole

I photographed it, sat in a sleigh, recorded a video diary

I took a few pictures and got out my satellite phone.

Warm the battery under your armpit,

I called 3 places. with mother

I'm the president of my girlfriend and sponsor

All three went to voicemail

(laughter) (video): 90 degrees north latitude

I feel special

The whole earth is spinning under my feet

the whole world is under me

I finally caught my mother. I was standing in line at the supermarket

Mother started crying. told me to call back

(Laughter) We skied past the North Pole for a week.

I wanted to get as close to Canada as possible before it got too dangerous to proceed.

this is the last day on the ice

When I spoke to the project's management team, he said, "Ben, things are getting too dangerous. Just south of you.

There is a huge open water surface. i want to pick you up

Find the runway

They said

This is the view outside the tent during this deadly call. I'd never build a runway

I didn't. Manager Tony said, "Look, Ben. Find 500 meters of flat, thick, safe ice."

The only ice I could find - after 36 hours of skiing to find the runway - was 473m. I could measure it with my skis

I didn't tell Tony or the pilot about it.

I thought it would work out

(Video): Wow, Wow, Wow

I just managed. It was a really dramatic landing. The plane passed by four times, and I was a little worried that the plane wouldn't land.

The pilot was called Troy. I thought a pilot who would do this sort of thing would be a very tough guy.

By the time the plane landed, I was crying. it's a touching moment

I thought I had to calm myself down for Troy.

I must be like a stalwart and tough explorer

The plane came to where I'm standing

The door opened and a man jumped out. It's about this tall. He said "Hi, I'm Troy"

(laughter)

The co-pilot was a woman named Monica.

she was sitting in a knitted jumper

They were the least macho people I've ever met, but they kept me entertained.

Troy smoking a cigarette on the ice I took some pictures. Troy climbed up the ladder and said, "Get behind me."

He threw down his cigarette and went forward and I climbed up behind him.

(Laughter) After a few trips up and down the runway and flattening it out a bit, Troy said, "Okay, let's go."

Troy put his hand on the throttle

You'll see the engine controls in the cockpit ceiling.

It's a small bar over there. Troy put his hand on that throttle

Monica gently put her hand over Troy's hand

"Let's go. It's all or nothing," I thought.

The plane took off as it scurried forward and bounced off the runway.

One of the skis hit an ice ridge at the end of the runway and the plane tilted. I could see inside the cockpit. As Troy wrestled with the controls, he took one hand out, stepped back, and flicked a switch on the cockpit ceiling, which was the "Fasten your seatbelts" sign on the wall.

(Laughter) From the air, I could finally see the big picture.

Of course, when you're on ice, you can only see one obstacle at a time, be it ice ridges or water.

That's probably why I didn't really care about the length of the runway.

it was really starting to fall apart

why? I'm not an explorer in the traditional sense

I don't draw maps while skiing. Everyone knows where the North Pole is.

Antarctica has a huge science base and a runway.

There are coffee shops and shops for tourists.

For me, it's about testing the human limits, pushing the limits of physiology, psychology and technology, and that's what excites me.

It's also about possibilities on an individual level.

Exploration for me is an opportunity to test the limits – really push the boundaries of what is possible and see how far you can go.

On a broader scale, I am amazed that people are only scratching the surface of their potential, using only 3-5% of what they can actually do. So I hope this trip will inspire others to think about what they want to do in the short time of their lives, using their potential.

that's my summary

The next question is how do you go to the toilet in minus 40 degrees?

The answer, of course, is "it's a trade secret." And the final question is, what's next? is. I'll answer as quickly as I can. If there's one minute left at the end, I'll tell you more.

What's next: Antarctica

Antarctica is the coldest, highest, windiest and driest continent on earth

In late 1911 and early 1912, there was a race to be the first to reach the South Pole - the center of Antarctica.

If you include the coastal ice shelf - you can see the huge Ross Ice Shelf - the Ross Ice Shelf is about the size of France.

Antarctica is twice the size of Australia, including the ice shelf. it's a huge place

There was a race to reach the South Pole between Norwegian Amundsen with dogsleds and huskies and British Captain Scott.

Scott had a small horse, a tractor, and a few dogs, but none worked. So Scott and the four men decided to go on foot.

They reached the South Pole in late January 1912 and found the Norwegian flag already there.

There was a tent and a letter to the King of Norway

The Scotts turned back and headed for the coast, all dying on the way back.

Since then, no one has skied -- this was 93 years ago -- and no one has skied from the Antarctic coast to the South Pole and back.

Every expedition to Antarctica either flies back from the South Pole or uses a car or a dog or a kite somewhere in the crossing. that's the plan

I'm trying to do it with two people

that's enough

One last thing I want to say before we get to the toilet issue, I forgot to look through this, but here is my school report. It was on my desk at home when I was 13. It says, "Ben lacks the momentum to do anything worthwhile."

(Laughter) (Applause) If I've learned anything, it's this: You are the only authority on your potential.

Only you can decide how far you can go and what you can do.

Ladies and gentlemen, this concludes my talk. thank you

Thank you very much

First read the poem

"Oh my dear dentist, in my mouth is your rubber finger...

Your muffled whispering voice...

Can you at least lower your mask Dentist, please lower your mask."

(Laughter) Okay, in this presentation, I'm going to give your right brain a serious exercise.

I'm going to show you a lot of images, and some of them may not be relevant to what you're talking about, so I'd like you to split your brain in half, and let the other side listen to what I have to say.

This is my personal story about how something changed my outlook on life.

That was six years ago, and after 20 years of graphic design and typography, I decided to leave the normal graphic designer way and change the way I work and take a more personal approach, trying to make a small attempt to make a living doing what I love.

Then a strange thing happened

My popularity has skyrocketed

My current work seems to catch people's attention, and I'm surprised myself. I think

But I've come to realize that the appeal of my work seems to have something to do with why I make it.

I now call myself a graphic artist.

And if there's a strategy as a graphic designer, my work is to follow my heart and my interests, to follow my ego's guidance and create work that satisfies both myself and my clients.

But this is unique in the design industry.

Because the ego shouldn't be reflected in graphic design.

But for me, it's always been my own work, it's personal work, and the more I work on it, the more successful it is, the more appealing, the more interesting, and the longer it stays popular.

So I'm kind of outside the general design thinking.

Instead of thinking about quantifiable outcomes, we tend to aim for elusive values ​​like, "Is it fun to do?"

"Is there anything that will surprise you?"

The question is, "Will it pique your curiosity?"

By the way this is a scientific diagram

I don't have time to explain, but it's a design related to DNA and RNA.

I create visual art with such a unique and imaginative approach.

When I'm creating, I'm interested in the visual structure, the unexpectedness, and the elements that make you think about what's going on.

That's why I'm particularly drawn to systematics and patterns.

I'll give you some examples of how my brain works.

This one was produced for the British Guardian newspaper.

I publish a magazine called G2.

I made it for the magazine's 2007 puzzle feature.

Making it was like a puzzle

I started by creating a number of individual tiles.

We deliberately designed these tiles to incorporate some of the letters of the alphabet, so that you could lay the tiles side by side to create an alphabet and a word in an abstract pattern.

At the same time, you could flip the tiles, rotate them, combine them in different ways to create symmetrical or abstract patterns.

The first is the word puzzle

And then I surrounded it with this abstract pattern

As you can see it is very difficult to read

But just by coloring certain parts of the letters, you can make the words stand out from the background pattern.

But maybe it's too easy

You can add a little color to the background, and a little more color to the words themselves. And this way, in consultation with the art person, you can get it just right.

I also like to design with unusual materials, and I like to use common materials in unusual ways.

To do that, we have to think about how we can manipulate the material as desired while maximizing its original properties.

The ultimate goal is to create something unexpected.

I also commissioned three-time TED talker Stefan Sagmeister to make it out of sugar with this in mind.

This project basically started at my kitchen table.

I've been eating cereal for breakfast since I was little.

This also means that from a young age, I used to spill sugar on the table and trace it with my finger.

And later, I used this technique to create artwork.

Then, using the same technique, I made six works for Stephen's book, "What I've Learned in My Life."

These were made freehand without drafts. I poured sugar on a white surface and moved it around to create letters and designs.

Recently, I also used cheesy pasta to make a classy baroque frame.

This is for a chapter in my book, because this chapter is about respect.

It's a bit of an unexpected combination, but from a point of view, it's respectful when you think of the macaroni art that kids make for their parents at school and give them to their parents.

You can make this out of aluminum foil at home.

Or rather, something I can make with aluminum foil I have at home.

(Laughter) I'm just as interested in designing wonder as I am about being wonder.

When I say "I wonder," I mean I have a question, I have a question.

"To experience wonder" is to have a sense of awe

So now I'm creating a book that plays with the meaning of words, while simultaneously exploring my ideas and questions with a peacock-like high visual expression.

the world is full of wonders

But in the graphic design industry, most of the time, that's not the case.

So in my book, I'm testing books that have a fascinating interdependence between words and drawings.

One of the things I love about religion is that it uses visual surprises to convey its message.

This basic fusion of art and information is sadly underused in adult books, and it makes me wonder why visual effects aren't used more to enhance knowledge.

When we see works like this, we tend to associate them with children's books.

There seems to be a sense that decoration spoils the serious content.

But I hope we can create an opportunity to change that feeling.

This book is taking some time, but it will be finished soon.

For some reason I thought it would be nice to have a break in the middle of the story.

This is a break, so that you and I can take a breather.

(Laughter) By the way, I'm giving you a Valentine's card.

Since 2005, I've been giving out quite a lot of Valentine's cards.

These are my Valentine's cards from 2005-2006.

When I started, I was sending a single design like this to each person.

In 2007, I had the crazy idea of ​​hand-writing a Valentine's card for each person in my address book.

Narrow down the address list to 150 people

I drew a different Valentine's card for each person, wrote the person's name on it, numbered it, signed it, and mailed it.

Believe it or not, this was a time-saving method.

Earlier in the year, I was so busy that I didn't seem to have time to design and print one Valentine's card.

So I thought that I could do it little by little like this during my travel time.

It was not strictly so

There were a lot of things, but I was able to finish everything in time and it was very well received.

Achieved a response rate of nearly 100%

(Laughter) For those of you who didn't respond, I will never send you anything again.

(Laughter) Last Valentine's Day, I took a more conceptual approach.

It occurred to me that it would be nice if the other person received something like a mysterious love letter, like the fragment left in the mailbox.

It wasn't addressed to that person, it wasn't signed by me, and I wanted it to make the other person wonder what the heck it was.

So I wrote a four-page letter with no particular connection.

4 different versions of the letter

And I deliberately wrote it to start in the middle of a sentence and end in the middle of a sentence.

While it's universal and doesn't come up with a specific name or place, the content is intimate.

I wanted people to really believe that it might be a love letter to themselves.

I will read one of them

"You don't seem very confident, but I can say with certainty that this habit you care about is very attractive.

Just accept that those who notice your uniqueness that spills out with a smile will feel happy just by looking at it.

Spending time with you is like chasing and catching a little bird, without worrying about scratches or droppings."

(Laughter) "So what I'm trying to say is that your kindness and your words are glimpses and sometimes elusive, but when you grab them and take a closer look, they're really nice, they're a very nice reward.

When I'm with you, I lose track of time I only get things I want to keep forever And at the same time I want to let go

impossible? but it's true

I think you're embarrassed

I can see that it's bright red

But I wanted to tell you no matter what, because you seem to doubt yourself, and it annoys me that you don't know how wonderful you are.

(Laughter) (Applause) It's Valentine's Day in a few days, and these are now being delivered to mailboxes around the world.

This year, frankly, I had a pretty cool idea, and I decided to laser cut out used Christmas cards to make Valentine's hearts.

So I asked my friends to send me used Christmas cards, and I made 500 of them.

each completely different

It's already really great

I can't say anything else it went very well

Of course, I spend a lot of time at work as well.

One of the things I've been thinking about a lot lately is what's worth doing.

What is my job worth spending my time and life on?

It's something that sometimes bothers me when I work in the world of commerce.

Sometimes it really depends on money

But fundamentally, I don't think that's a worthy goal.

What motivates me is my clients and the people I work with The work environment The audience I can influence

So I think, "Who is it for?"

"What are you suing?"

"What impact will it have?"

By the way, I'd like to make a quick confession: it's not easy for someone like me to get on stage at this conference, because you're in front of people like you who are incredibly smart, thinking big-picture ideas and technologies that change the world and change lives.

And all too often, designers and people in the visual arts feel like they're not contributing enough to the world.

In the meantime, I'm showing you beautiful designs and talking about aesthetics.

But I've come to believe that truly imaginative work is very important in our society.

I get my inspiration from all sorts of books and magazines, conversations and movies, and in the same way, when I put my work out in the mass media, if it's funny and different and interesting and intriguing, I think I'm planting the seeds of the public's imagination.

And I don't think you know who's going to take what from it and come up with something completely different, because inspiration is interactive.

So one of my works might inspire a screenwriter, a novelist, a scientist, and that, in turn, could inspire a doctor, a philanthropist, or even a babysitter.

It's not something that can be quantified, it can't be tracked and measured, and we tend to underestimate what we can't measure in society.

But I truly believe that in a well-functioning, prosperous society, these kinds of seeds, coming from all directions and from all walks of life, are necessary to keep the wheels of creativity and imagination running smoothly and magnifying.

So that's why I do what I do. That's why I put so much time and effort into it. And that's why I do it as a commercial, high-visibility job, instead of making it privately in a secluded space.

I think it's actually worth it to spend our precious limited time on this planet this way.

Thank you for the opportunity to tell you about this

(applause)

I am honored to be here.

It's an honor to be next to Brian Cox at CERN.

CERN has the Large Hadron Collider.

So what happened to the smaller one?

Is there a small hadron collider?

Because it used to be big

The smaller one must have been put away in a cupboard and forgotten.

As you know, the Large Hadron Collider had trouble starting up, and it was necessary to investigate the cause.

Stakeholders should clarify

What we learn from Bryan's talk, and that wonderful photograph, is this: Your perspective determines your results.

According to Brian, science is valuable because it's constantly pioneering new ways of looking at us.

The way you choose your point of view determines almost all your results

The questions you ask pretty much determine the answers.

See this question: "How do we know the future of education?"

So far, the answer is simple. At least for the last 20 years, people told me to go to Finland.

Finland has one of the best education systems in the world

Finns are boring, depressed, and have a high suicide rate, but they're still well educated.

the education system is great

People flock to Finland, and they're amazed at Finland's social democratic achievements, their homogenous culture, and so on, but they wonder how they're going to translate those achievements into their own country.

So, over the past year, fortunately with Cisco's financial support, I've been searching for new answers.

Radical innovation sometimes comes from the best of circumstances, but it can also be the result of a ravenous desire, an unfulfilled latent demand, a shortage of everyday resources, a lack of specialized and costly services provided by schools and hospitals.

That's where I ended up

It's called Monkey Hill

It's one of the hundreds of shanty towns in Rio.

Population growth over the next 50 years will occur in urban areas

Over the next 30 years, the population will increase by 12 million in 6 cities each year.

Increases rarely occur

It's places like the developing world and Monkey Hill.

We have the fastest growing youth population here in the world.

If you need something to do about health or education or policy or whatever, you should go to these areas.

Then you can meet someone like him

my name is wandason

I'm 14, and like many 14-year-olds, I've fallen behind in the Brazilian education system.

it was boring

Instead, Wanderson has turned his hand to a world of drug trafficking that creates opportunity and hope in the region where he lives.

By the age of 16, his position had grown exponentially, and he was running 10 shantytowns.

$200,000 in weekly sales

employed 200 people

I would have been dead by the time I was 25.

Fortunately, I met this guy, Rodrigo Baggio, the man who brought the first laptop to Brazil.

In 1994, Rodrigo started an initiative called CDI, where he created places like this by putting corporate-donated computers in community centers in shanty towns.

It's the technology that makes learning easy and fun that has set Wanderson back on its feet.

There is also a place like this

Kibera is the largest slum in East Africa.

Millions of people live here and it's spread out for miles.

This is where I met these two, Azra on the left and Maureen on the right.

I had just finished my secondary school in Kenya.

Kenya's education system was almost entirely introduced from England around 1950, but it's gotten pretty bad.

This is what a school in a slum looks like

it's a place like this

It's the school Maureen attended.

This is a private school.There are no public schools in the slums.

Education here is poor

There are many other areas, but this one is a school built by nuns in another favela called Nakuru.

Half the class has no parents because they died of AIDS.

The other half have one parent, because one parent died of AIDS.

In these areas, the lesson to be educated is not to know Kenyan or British kings and queens.

It's about surviving, earning a living, and not becoming HIV-positive.

Industrial technology isn't the solution to bridging the gap between rich and poor in these regions.

neither electricity nor water

it's a cell phone

EnglishIf you're really starting from scratch in any public sector project in Africa, you're starting with a mobile phone.

There are also areas like this

It's called Madangiri Emigration Colony, and it's a fairly developed slum, about 25 minutes from New Delhi.

There's something about these kids that's remarkable. They're also a sign of the social revolution sweeping through the developing world.

10 years ago we would have been married

But I want to study more and get a job without getting married.

The mother who raised them was illiterate and never did her homework.

In developing countries around the world, millions, tens of millions, billions of parents are giving their children homework and tests for the first time.

The reason they keep studying is not to go to a school like this.

this is a private school

It's a good school but the tuition is expensive

This is the best school in Hyderabad for Indian educational environment.

The reason I keep studying is here, not at school

This is a computer at the entrance of a slum. It was installed by a revolutionary social entrepreneur named Sugata Mitra.

These kids have never messed with Google

I know nothing about Wikipedia

Think about how your children's lives would change if you enabled them to use it.

Through the many examples of different social entrepreneurs who have gone through this journey, as I have done, and who have dealt with very challenging environments, the way they think about learning is very different from school.

What is it like?

Education can be said to be a universal faith

Combining education and technology creates a source of hope

There are also areas like this

This is a school in the suburbs, three hours from São Paulo.

Most of the children's parents are illiterate

Most homes don't have electricity

Using a computer, browsing websites, making videos, etc., is something that we take for granted.

When you go to these places, you realize that education in that environment works by drawing out, not pushing.

our education system is intrusive

i was sent to school

If you go to school, knowledge tests, systems, timetables, etc. will be imposed on you.

But a compulsory curriculum is powerless to motivate a child like Wanderson who buys guns through drug dealing, wears jewelry, rides motorcycles and hooks girls.

Then I won't even look at you

need to provoke interest

pull it out without pushing

The concept of curriculum is irrelevant in this environment.

We need to start educating them with what is important to them in this environment.

What is that?

Motivation is important, and there are two sides to it.

One is to provide extrinsic motivation, education pays off.

The whole educational system works under the principle of reward, but the waiting time is long.

too long for the poor

Waiting 10 years to reap the rewards of your education is too long for someone who needs groceries or needs help from siblings or helps with work.

We need an education that's relevant to life and immediately useful for earning a living.

There must be another intrinsic motivation.

I've met people like this many times

My name is Sebastiao Rocca, and I'm an amazing person. I'm in Belo Horizonte, Brazil's third largest city.

He devised over 200 educational games on all kinds of subjects.

In schools and communities where Taio works, they start the day in a circle, and they always start with a question.

Imagine an education system that starts with questions rather than imparting knowledge, or even games instead of lessons, and starts with the principle that to be successful in education, you need to keep yourself engaged.

In our education system, sports, theater, music, etc., you can try later, if you're lucky.

they educate through

It's possible to attract learning because it incorporates dance, it incorporates circus, and a classic example is El Sistema in Venezuela, which incorporates music.

That's what attracts you, not after you've finished learning or after you've lost your young cognition.

El Sistema in Venezuela uses the violin as a learning tool.

Taio Rokka uses soapmaking as a learning tool

When we take these measures, we find that we make incredibly creative use of people and the environment.

There are different types of peer learning

When the teacher doesn't come When there is no money to ask When a teacher comes to teach something unrelated to the community How do you teach?

Prepare your own "teacher"

You can teach each other, you can hire temporary teachers, you can even think about expanding your own specialties.

Let's use various technologies, people, and environments to think about learning methods that suit each person.

This is a school in a bus on a construction site in Pune, one of the fastest growing cities in Asia.

Pune has 5,000 construction sites.

30,000 children are learning at construction sites like this.

only in one city

Tens of millions of children are going to school on construction sites in explosively growing urban areas across the developing world.

It's a simple concept to use the bus to provide learning opportunities.

Here, we see learning not as research and analytical activities, but as productive activities, activities that enable us to create something and earn a living.

I met Stephen here

He spent three years living on the streets in Nairobi because he lost his parents to AIDS.

But I came back to school, not because I could get my GCSE, but because it taught me how to be a carpenter in a hands-on, hands-on way.

Some of the world's most advanced schools, such as Hi-Tech High, use production as their learning philosophy.

no choice

Learning should be productive, to be meaningful.

The model we refer to for diffusion is a strange one, and it's a model that spreads like a Chinese restaurant.

It's this guy who told me, he's very personable.

He is a social entrepreneur who is attracting worldwide attention in the field of education.

My name is Madhab Chaban, and I made something called Pratham.

Pratham runs preschool gathering places for 21 million children in India.

The world's largest educational NGO and others

We support children of the working class to go on to higher education.

he's a complete revolutionary

I also have a background as a union organizer, and that's where I learned how to organize.

At some point, Pratham grew up to have McKinzie's charitable contributions.

Looking at his model, McKinzie said, "What do you think we should do?

Change to McDonald's

When you do it in another region, it's a franchise.

same in all regions

Reliable and easy to locate

It never fails.”

Then Madhab replied, "Is it necessary?

Can't it be like a Chinese restaurant? ”

There are Chinese restaurants everywhere, but there are no Chinese restaurant chains.

Chinese restaurants are known

There may be subtle differences such as colors and names, but you can predict

You can recognize it when you see a Chinese restaurant

It's sharing the Chinese restaurant model, different practices, different environments, but the same principles.

The McDonald's model expands

The Chinese restaurant model spreads

Mass education started in the 19th century with social entrepreneurs.

Now again, this is desperately needed on a global scale.

What do you get out of it?

Of course, we can learn a lot, because our education system is just so flawed.

not given to those who need it most

Even if it catches the target, it misses the center

It's getting harder to even try to improve it, and confidence in the system is pretty shaken.

What kind of innovation is necessary? What kind of new plan is necessary? Here is an easy-to-understand summary

There are two basic types of innovation

One is supportive innovation, which helps existing institutions and institutions, and the other is disruptive innovation, which involves dismantling existing things and remaking them in new ways.

The environments in which innovation takes place can be public settings such as schools, universities, hospitals, or private settings such as communities, families, social relationships.

Most of us do this yellow part, which is supportive innovation in the public environment, which is a way of improving the Bismarckian school system that developed in the 19th century.

The problem here is that there are no teachers in the developing world who can implement this method.

China, India, Nigeria and other developing countries need huge numbers of teachers to meet the demand.

Simply pushing forward in the same way as we do will not cut through the deep educational inequalities that exist in urban centers and former industrial areas.

So we need three more innovations.

more reforms needed

All over the world, schools are now reinventing themselves.

school is different in school

There's a school called Big Picture in the United States and Australia.

There's a school in Sweden called Kunskapskone.

Only two of the 14 schools are included in the school.

Many are built as separate facilities that are not schools

In North Queensland, there's this weird school called Jarrigan.

What they all have in common is a high level of collaboration, a personalized approach, and an easy-to-disseminate approach, where learning starts not from knowledge or curriculum, but from questions, questions, and proposals.

There are still things to consider

And since many of our educational problems are not just school problems, but also home and community problems, of course we're going to need the right domain.

Efforts to supplement schools are necessary

The most famous is Reggio Emilia in Italy, a family-based learning system that supports and encourages students.

In particular, the Harlem Children's Zone, led by Jeffrey Canada for over 10 years, has been interesting, trying to link schooling with home and community initiatives, and try to transform not just schools, but the culture and the aspirations of about 10,000 families in Harlem.

We also need a completely new and forward-thinking way of thinking.

There's a neighborhood that needs innovation that you never thought possible, just around the corner that you can get to in less than an hour from this room.

And finally, we need a big change that promises to provide learning opportunities in completely new and different ways.

2015 looks set to be a great achievement: universal access to school.

By 2015, anyone under the age of 15 will be able to go to school if they want.

that's great

But this is not the rapid and methodical development of the automobile industry. The school system, of course, is a legacy of the 19th-century Bismarckian German school system, introduced by reformers and religious preachers in England to strengthen social cohesion in the United States, and in Japan and South Korea during the growing years.

Originating in the 19th century

I got great results

I will continue to release

Skills, learning, literacy, and other outcomes will be available.

But it's going to ruin your imagination

Destroys learning motivation and social credibility

As we liberalize, we stratify society.

We end up giving developing countries a school system that will take a century to reform.

So a radical shift in thinking in how we think about learning is more real than ever, and it's needed now.

thank you

When I was 10, my cousin, who is a medical student, showed me around his college.

He put me in his pathology lab as a special treat, and he took out a human brain in a jar and put it in my hand.

On it lay the source of human consciousness, what governs the human body.

That's when I decided that when I grew up, I wanted to be a neurologist or a scientist.

Many years later, my dream came true

PhD theme

It was neurological -- childhood dyslexia -- and today I'm going to share with you an astonishing fact that I faced at the time.

It is estimated that 1 in 6 children have a developmental disability.

A developmental disorder is a condition in which a child's mental development is delayed, leading to lifelong mental disorders.

It's calculated that everyone in this room knows at least one child with autism.

but what puzzled me was

While these disorders invariably arise in the brain, most cases are diagnosed on the basis of observable behavior alone.

Diagnosing a brain disorder without actually looking at the brain is like treating a patient with a heart problem based on physical symptoms without even taking an ECG or chest X-ray.

Accurate diagnosis of brain disorders

My intuition was that the right treatment needed to look at the brain first.

Observing only behavior misses the heart of a child's problem, and sometimes leads to a misunderstanding.

But despite all the advances in medical technology, the diagnosis of a brain disorder that affects one in six people has been too routine.

That's when I got to know a team at Harvard University, who had gone so far as to apply some advanced medical technology, not to study the brain, but to diagnose children with brain disorders.

It's a revolutionary technology that records brain waves, or the electrical activity of the brain, in real time. It allows us to observe different aspects of the brain's functioning, and to detect even the slightest abnormalities in the functions that govern vision, attention, language, and hearing.

It's called an electroencephalogram -- a program that locates abnormal electrical signals.

Another program, called Statistical Probability Mapping, performs the mathematical calculations to determine whether any indication of an abnormality is clinically significant, so it can make an accurate diagnosis of neurological conditions in children.

That's why I was put in charge of a neurophysiological department, where we were finally able to use this technology to help children with brain disorders.

I'm happy to say that India is also in the process of launching this technology.

Here's a story about a boy who was featured on ABC News.

I'm Justin, seven years old. He was diagnosed with severe autism before he came to our clinic.

Like many children with autism, he was closed-minded.

Justin was sometimes vain

His parents had been told by doctors that Justin wouldn't be able to develop social skills, and that he had difficulty learning the language.

When we actually looked at Justin's brain using a revolutionary electroencephalogram technology, the results were astonishing.

We were able to say with almost certainty that Justin was not autistic.

He was suffering from epileptic seizures that were not identifiable by the naked eye, but they were causing symptoms similar to those of autism.

After taking antiepileptic drugs, there was a surprising change.

In less than 60 days, his words went from counting to 300.

Communication improved dramatically, I got into a regular school, and I got good grades in karate.

Nearly half of all children diagnosed with autism have an invisible epileptic seizure, studies show.

These are the children I tested, and they were all in the same situation as Justin.

All of the children had been diagnosed with autism, attention deficit disorder, intellectual disability, and speech disorders before coming to our clinic.

Our EEG scanners have identified certain hidden problems in their brains that we could never have discovered just by judging their behavior.

EEG scans like this can give children a more accurate diagnosis of their cranial nerves, allowing them to be treated more appropriately.

Children with autism have long been misdiagnosed, left undetected, and left to aggravate their problems.

And these children and their parents have long suffered from a great deal of frustration and hopelessness.

But we're in a new age of neuroscience, where we can see first-hand how the brain works in real time, without the risks and side effects associated with it, and painlessly pinpointing the real cause of many children's disabilities.

If you know anyone who has a child who suffers from autism, please share this innovative diagnostic method with them, as it may help one person solve many problems.

Another child's heart opens the door

We realize the true potential of children who have been misdiagnosed -- or not even diagnosed by conventional means -- and still have time to heal.

It's easy, just watch their brain waves.

thank you

(applause)

There are dark ages in this world

The Dark Ages is the blank period between the last time you played with Lego when you were a kid and the time you were an adult and played with Lego with your kids.

It all started when my child was four years old.

"This is good"

go to the lego store

bought this

Perfect for a 4 year old

(Laughter) The instructions on the package say, "For ages 8 to 12."

I showed the box to my wife and asked her, "Who should I buy it from?"

I was convinced because I answered, "We are."

It soon got a little out of control

The dining room has become

When I walk, Lego hits me and it hurts

So I decided to take it to the basement room, which until now had become the Abu Ghraib prison.

(Laughter) This is torture, it's funny.

you guys have good sense

I put down a little floor tile and went on eBay and bought 150 pounds of Lego (Laughter).

The day I bought my daughter Lego, I wrestled with her in Lego, and I said, "Honey, you're my treasure."

My daughter said, "No, Lego is a treasure, isn't it?"

(Laughter) "Dad, I've got a lot of Lego," she said.

"Yeah, I think so."

and I had no choice but to answer

Once you start, it's like, "Where am I going to put this?"

You go to a container store and you end up spending a ton of money, and then the maddening sorting begins, and it's so silly.

no matter what they say

I know that there are such customs

some people build the titanic

I'm sure you're like, "Oh my God."

"In a truck or semi-truck," you think, "I'll have to carry it."

Some build Seattle's Smith Tower

it's really amazing

Some people sell things like this, Lego-only aftermarket weapons, that's Lego, the Danes, no, they're not into guns.

Then are you American? It wouldn't hurt to make a gun out of Lego

Depending on how you look at it, you might think, "What a geek."

I think I'm a nerd, but this is a few steps beyond passion.

(Laughter) These nerds don't sleep with ladies with condoms in their pockets.

In my case, I thought, "Oh, I guess that's what I am."

coming out

I'm so absorbed in these things that my shame disappears.

And then you get more and more into it, and you start thinking, "Who's doing Lego in Denmark, do you have all this software to build on your computer?"

It's like the CAD program you use to build

You can design anything on your computer Click the button and it will be delivered to your home in a week

Some of the designs are actually sold in stores.

Weirdly, Lego geeks don't give royalties for their creations, but some people sell what they make.

it's a wonderful thing

As you've probably noticed, the CAD programs that Lego provides aren't enough. There's a fully open-source, third-party CAD program for Lego that can do 3D modeling, 3D rendering, and even create movies out of Lego.

Can I have a minute

A guy who runs away with his hand raised is good

anyway

(Laughter) We have a complete programming language and robotics tools, and if you want to teach anyone how to program, whether you're a child or an adult, it doesn't matter.

The person who invented this made a slot machine out of Lego.

It's not that I made Lego that looks like a slot machine, I made a slot machine that's made out of Lego.

Lego inside

Some people are crazy about building Lego, let's finish it before it offends you

Lego has its own gray market, thousands of private businesses.

Some people sell little pieces of their creations to fund their entire Lego production.

I'll give you some examples. This is very sculpture-like.

It's amazing that you can make something like this

It's not a child's play, it's architectural details and beautiful natural shapes that are made up of small blocks.

this is my house

and this is my house

While I was taking pictures to show you, I was afraid a car would come and wreck it.

Well I'm running out of time

But in short, I can show you as soon as possible.

Because there aren't many TED logos

(laughs) okay

I made it

Jaan

(applause)

My best friend recently had a baby

When I met him, I was in awe of how this little beautiful creature could step into our lives.

It made me realize that we're not just joining our lives, but a part of this crazy world, a world that, especially right now, feels absolutely incredibly difficult.

I spend a lot of time at work talking about who we are, what we should be, and what it means to be healed.

When I held him for the first time, I was ready with words of comfort.

I wanted to teach the child that finding their own strength is through facing challenges.

I wanted to teach them that if you start small, you can do big things.

I wanted to teach that each of us is much more resilient than we can imagine.

Here I'm holding little Thelonious

When I look down at him, this thought comes to mind, he's still a baby.

(Laughter) Because you won't understand a single word that I speak to you.

I thought it would be better to go home and write it down instead.

Yes, this isn't just for grown-ups, it's for Thelonious when he's old enough to read, and the world is telling you to be a better person.

don't be afraid to answer "yes"

Start by becoming a better listener

Start by walking better down the street

when you meet people

Say "hello"

ask how they are and listen to what they say

From being a better friend, to being a better parent, to being a better child to a parent, to being a better brother, sister, lover and a better partner.

Start by being a better neighbor

meet strangers and try to get to know them

The world tells you, "What are you trying to do?"

Don't be afraid to answer, "I can't do everything, but I know there are things I can do."

Visit more rooms and say, "I'm here to help."

please be tolerant

give what you can give and do what you can

Give me money Give me time Give me love Give me heart Give me soul

The world tells you "We need peace"

Find peace in your heart and keep it sacred wherever you go

If you can't create peace within yourself first, you can't share it or create it with someone else.

The world tells you "they are the enemy"

Just because someone disagrees with you doesn't make them your enemy.

You may not win the argument, you may not change your mind, but if you choose to do so, you can achieve the victory of deep empathy, understanding what's inside your heart.

What the world tells you is you need justice

Please check

Find the truth that goes beyond the stories you've been told

The truth that cannot be imagined from the appearance

"Why?"

"Is this fair?"

Ask, "How did you get here?"

please do it with care

please be patient

learn to forgive others

Start by truly learning how to forgive yourself

we are more than the mistakes we make

we are more than we were yesterday

we all deserve dignity

find yourself in others

Recognize that your justice is my justice and my justice is yours

We cannot be free unless the other is free.

(Applause) The world tells you, "I'm violent."

Respond by saying, "I'm not violent.

Neither my words nor my actions are violent."

The world tells us, "We need to heal the earth"

Start by saying, "Plastic bags are fine."

Please recycle and reuse

Start by picking up a piece of trash that fell on the street.

The world tells you "too many problems"

don't be afraid to be part of the solution

start by discussing the problem

You can't get over what you turn your back on

The more we talk, the more we can see that the issues are connected, because we are connected.

The world is telling you "We need to end racism"

Please start by eliminating feelings of discrimination in your family.

The world is telling you, "How am I going to talk to someone with preconceived notions and prejudices?"

Start your first conversation at your kitchen table.

The world tells you "too much hate"

devote yourself to love

Love yourself and you will learn to love others without hindrance or criticism.

When the world asks big questions that want big answers, we have two choices.

1. Feeling terribly overwhelmed or unfit to do anything

Part 2: Start with Small Actions and Think of Yourself as the Right Person

I'm the director of the National Security Agency, and you are too.

No one may appoint us, we may not be approved by the Senate, but we can protect our country.

The more secure one person is, the safer the country is.

Reach out your hand and say, "Are you okay? I'm here."

Just tell me so, you can change your anxiety to peace of mind

We find ourselves asking the world, "What should I do?" "What should we do?"

A better question would be, "What do I look like to people?"

I want peace in the world, but do I feel at peace when I meet my family and friends?

I want the world to be free of hatred, but will I be there with love, not only for those I know, but also for strangers?

Am I lovingly reaching out to those who have ideas that conflict with mine?

We demand that the world be free from suffering, but are you facing the suffering on your street corner?

We tell the world to change, we need change

but to change my life

What can we do to change the lives of people in our community?

As James Baldwin said, "You should assume that you have everything now, and you have no right to assume otherwise."

this was always true

No one appointed Harriet Tubman to fulfill her purpose, her mission, her courage.

"I'm not a congressman, I'm not the president of the United States, so I can't fight to abolish a system as monstrous as slavery!"

She spent 10 years making 19 trips and liberating 300 people, one group at a time.

Think about their children Think about their grandchildren, great-grandchildren, and beyond

Our moral deeds create immeasurable ripples in the endless river of justice.

Hurricane Katrina, Harvey, Irma, Maria, people don't say, "It's a disaster. What should I do?"

got down to business they could

Those who had boats got into the boats and started taking all the women, men, and children they met on board.

Here and there, people gave someone money, even a little money, gave hearts, gave souls

We spent too long thinking we didn't have the power to change the world.

We forgot that the power to change other people's lives is always in our hands.

Change isn't just for certain people, it's for all of us.

You don't have to wait for someone to tell you that you can do it too.

please start

With what you have What you can do Where you are Now in your own way

We don't have to be heroes, we don't have to wear uniforms, we don't have to call ourselves activists, we don't have to win elections to get involved.

All you need is enough courage to show compassion

Around the time Thelonious was born, I went to a man named Jean Moretti's birthday party.

It was his 100th birthday, and that means he's lived in the United States through the Great Depression, World War II, the struggle for workers' rights, women's voting rights, the civil rights movement, mankind's landing on the moon, the Vietnam War, and the election of the first black president.

I sat next to him and said, "Gene, you've lived in America for 100 years.

Can you give me some advice in these times? ”

he smiled and said to me

"Okay, be kind to as many people as you can."

And as he danced with my mom -- who, by the way, is half his age -- in a room full of generations of his family and hundreds of people who had traveled thousands of miles to celebrate, I realized that he wasn't just giving me advice, but the first steps that each of us can take, the first steps to create real, heartfelt impact in the world around us today.

"Be kind to as many people as possible."

thank you

(applause)

The story begins in Kenya in December 2007, when a questionable presidential election was held, followed by tribal violence in the immediate aftermath of the election.

Ori O'Cola, a lawyer from Nairobi -- as you may have seen from her TEDTalk -- started blogging about it on her site, Kenyan Pundit.

Shortly after the election and the violence, the government suddenly put in place a strong blackout.

So for people who want to know where things are happening, the blog's place in the media has changed from being just commentary to being central.

Okolla called on readers to provide more information.

And then the comments started pouring in, and Okolla sorted the information out and posted it on her blog.

But soon I started complaining

"Too much, I can't catch up even if I do it all day

The amount of information about what is happening in Kenya right now is more than one person can handle.

It would be nice if there was some way to automate this."

Two programmers who read the blog responded, "Well, we can do that." 72 hours later, they launched Ushahidi.

Ushahidi is the Swahili word for "eyewitness" or "testimony." It was a very simple system that could pick up field reports from the web, or even cell phones and SMS, and display them on a map.

That's exactly what was needed. What it did was make this tacit information accessible to everyone. We knew where the violence was happening, but no one knew what it was that people knew.

This is how the crisis mapping activity began in Kenya in January 2008.

So many people saw it and found it valuable that the programmers who created Ushahidi decided to open source it and turn it into a platform.

Since then, it's been used in Mexico to track electoral fraud.

In Washington, D.C., we monitor the snow removal situation.

Most famously, it was used in Haiti to inform the post-earthquake situation.

If you look at the map on the front page of Ushahidi, you can see how Ushahidi is used around the world.

In less than three years, one implementation of one idea that emerged in East Africa in early 2008 had spread all over the world.

What Okolla did would not have been possible without digital technology.

What Okolla did wouldn't have been possible without kindness to people.

We're living in an interesting time, where more and more social design challenges are dependent on these two things.

That's my go-to resource

I call it "thought surplus"

It represents the ability of people around the world to volunteer and contribute and collaborate on large, sometimes global projects.

Thought surplus has two components

The first is free time and talent in the world.

The world's people have a trillion hours a year of free time to contribute to shared projects.

Free time existed in the 20th century, but Ushahidi never appeared in the 20th century.

The surplus of thought has half an element

The media landscape of the 20th century was very good at encouraging people to consume, and as a result, we consumed more.

But now, with media tools like the internet and cellphones, it's possible to do more than just consume. People were immersed in TV, not because they liked it.

It's just because it was the only opportunity that was given to us.

Of course we still like to consume

But it's become clear that I love to create and share.

Ancient human motivations and modern tools come together to make the desire to participate in large-scale exertion possible, and it becomes a resource for new design.

And I began to see some really spectacular experiments with the surplus of thought in science, in literature, in the arts, in political activism.

and design

And of course lots of LOLcats

LOLcats is a cute picture of a cat, made even cuter with cute captions.

This is also something that has come to be seen today in the rich media landscape.

This is one of the participation models that we're seeing emerging with Ushahidi.

If you define it like a lawyer, LOLcats are the most ridiculous invention you can possibly think of.

There may be others, but you can see LOLcats as a prime example.

But even the most ridiculous creations imaginable are still creations.

Anyone who does something like this, whether it's mediocre or throwaway, is trying something, expressing something publicly.

If you've done it once, you can do it again, and you can tweak it to make it better.

From the mediocre to the great, there is a continuum of work, and if you've ever worked as an artist or as a creator, you know it's a continuum of steps that keep climbing to the top.

There's a gap between making something and making nothing.

And the people who make LOLcats have already crossed this gap.

You may want to skip the ad hoc stuff and just take the essential stuff straight to Ushahidi without LOLcats

But rich media never works that way.

Freedom to experiment means freedom to do any experiment.

Even in the holy printing press, pornographic novels appeared 150 years before scientific journals.

Before I talk about what the crucial difference between LOLcats and Ushahidi is, I want to talk about their shared sources.

The source is design for kindness.

One of the interesting things about our modern historical epoch is that even the surplus of thought has become a designable resource. Social science is also discovering how important our inner motivations are to us.

Here's a graph from a paper by Yuri Nezy and Aldo Rustichini, in 2000, which tested what was called the theory of deterrence.

Deterrence theory is a simple theory of human behavior that says that to keep someone from doing something, you have to punish them when they do something.

Simple, direct, common sense, unchecked

So they did an experiment in 10 nurseries in Haifa, Israel.

We looked at the most stressful time of day, the pick-up time.

A teacher who has spent all day with children would want parents to pick them up at a given time.

Parents, on the other hand, would like to be forgiven if they pick up their children a little late because they are busy with work, late, or have other errands.

Neezy and Rustichini thought, "How often do late pick-ups happen in these 10 preschools?"

So what we found is this graph, which shows the number of late pick-ups per week. On average, the 10 preschools had between six and 10 late pick-ups.

Then we divided the nursery school into two groups.

The white one is the control group, we don't change anything.

On the other hand, at the nursery school shown in black, "We will change the contract in the future. If you are late to pick up your child by more than 10 minutes,

I will charge you 10 shekels, no excuses."

I decided to

And then there was an immediate change in those kindergartens.

Over the next four weeks, late pick-ups continued to climb, reaching three times what they were before the fine, and then fluctuating between two and three times.

It's pretty obvious what happened

Fines have destroyed the nursery school culture.

By creating a fine, we sent the message to parents that the teacher's debt was paid off with a payment of 10 shekels, so they didn't have to feel guilty or feel embarrassed.

Parents thought, "If you pay me ten shekels, can I be late?

That's good! ”

(Laughter) The explanation for human behavior that we've inherited since the 20th century is that humans are rational, self-maximizing agents.

but this is not correct

People act according to social constraints even if they don't have contractual constraints.

And importantly, social constraints create a culture of friendliness more than contractual constraints.

After 12 weeks of fines in this experiment, Neezy and Rustichini said, "Well, let's end it. No more fines."

And then something really interesting happened: nothing changed.

Even after the fines were lifted, the culture that was broken by the fines remained broken.

Not only are economic motivations and intrinsic motivations incompatible, but the conflict will persist for the long term.

So the key to creating a situation like this is to have a good understanding of where the reliance is on economic transactions, like parents paying their teachers, and where it's designed to rely on social transactions and kindness.

Back to LOLcats and Ushahidi

In my opinion, what matters is the difference in range.

Either way, it depends on the surplus of thought.

Both are designed on the premise that people love to create and they want to share.

The crucial difference between these is that LOLcats are communal values.

That value is created between participants.

Collaborative value on the internet is ubiquitous -- any large aggregated or shared, publicly available data -- whether it's a Flickr photo or a YouTube video.

This is a good thing, and I love LOLcats more than most of you, but it's also a largely solved problem.

It's hard to imagine a future where someone is asking, "Where can I find pictures of cute cats?"

Ushahidi, on the other hand, is a civic value.

Its value comes from its participants, but it's enjoyed by society as a whole.

Ushahidi's goal is not just to improve the lives of its participants, but to improve the lives of everyone in the society in which it operates.

Such civic values ​​are not simply the result of human motivational manifestations.

It's the result of our collective efforts to do so.

There are 1 trillion hours of resources available for participation value per year

it continues every year

The number of people who will be able to participate in projects like this will grow, and we will see organizations designed around a culture of kindness accomplishing tremendous things without the extra costs of contract, which is a very different model from the large-scale collective action that was common in the 20th century.

What makes the difference is the inventor and entrepreneur Dean Kamen.

"A free culture gets what it admires"

we have a choice

There are 1 trillion hours in a year

we may consume it in vain

it will happen if you do nothing

But we can also honor and reward those who seek to create civic value through thought surplus.

And to the extent that we do so, we will change society.

thank you very much

We've been building suburbs for the last 50 years, with many unintended consequences.

So I'm going to talk about some of those results, and I'll show you a number of interesting projects, so that you can be optimistic that suburban remodeling will be a design and development project that will have a significant impact in the next 50 years.

Whether it's redeveloping run-down malls, reintroducing tenants into abandoned mega-commercial properties, tearing down parking lots and rebuilding waterfronts, but in fact, the growing number of vacant homes and unprofitable commercial properties that we see all over the suburbs, I think presently presents a tremendous opportunity to take care of the least sustainable neighborhoods and make them more sustainable.

And in the process, we do this by reinvesting economic growth into supporting existing communities and relocating their infrastructure.

So why is this important?

I think there are many reasons, but I'm not going to get into the details.

Just from a climate change perspective, the average American urban dweller

The carbon footprint is one-third that of the average suburban dweller, because in most cases, suburban dwellers drive more cars and live in single-family homes, which means they have a lot more exterior walls for energy to escape.

So from a strict climate change perspective, cities are already relatively green.

The big opportunity to reduce greenhouse gas emissions is precisely in the urbanization of suburbs.

We've doubled the total miles of suburban driving.

It has made us more dependent on imported oil despite advances in fuel efficiency.

There was so much car use that technology couldn't make up for it.

Public health is another reason to consider remodeling.

Researchers at the U.S. Centers for Disease Control and Prevention and others have made a strong link between a sedentary lifestyle and a pattern of suburban development.

And they're also linked to a staggering increase in obesity rates, these maps show, and obesity is also causing huge increases in heart disease and diabetes, with one in three children born today at risk of developing diabetes.

And that proportion is rising at the same rate as children who are no longer walking to school, again due to our development patterns.

And finally there is the question of price

So, despite rising gas prices, how affordable is it to continue living in the suburbs?

Over the past 50 years, suburbs have expanded in search of cheap land, and cheap marginal land has helped families live out the American Dream for generations.

But finally, the savings promised in the basic model of getting out into the suburbs where you can buy a house are vanishing when you factor in transportation costs.

For example, here in Atlanta, about half the households earn between $20,000 and $50,000 a year, and they spend 29 percent of that income on housing and 32 percent on transportation.

This number is from 2005

This was before the price hit $4 a gallon.

Yes, no one cares about transportation costs and bothers to calculate them, and they won't go down any time soon.

Whether you love the leafy private life of the suburb or hate its cold commercial streets, they are important reasons for suburban remodeling.

But is it doable?

i think it is possible

June Williamson and I have been investigating this subject for over a decade, and we've seen over 80 different projects.

But it's all really market-driven, especially what's driving the market is, first of all, large-scale demographic movements.

We all tend to think of the suburbs as places with a strong family focus, but that's not really the case anymore.

Since 2000, two-thirds of suburban households no longer have children.

We just haven't caught up with that reality.

This has a lot to do with the fact that two large groups of the population are dominating right now. The baby boomers are retiring, and there's a gap here: a minority of Generation X.

They're still having children, but Gen Y isn't old enough to have children yet.

Generation Y is another big generation

And as a result, demographers predict that by 2025, 75 to 85 percent of new homes will be childless.

And market research, consumer research that asked baby boomers and Gen Y about their aspirations and the living conditions they want, tells us that the demand we've already seen for a suburban, more urban lifestyle is about to become enormous.

What it boils down to is that baby boomers want a better place to age, and Gen Y wants an urban lifestyle, but most of their jobs are in the suburbs.

Another big change dynamic is the true performance of the asphalt that's not working.

Sounds like a cool name for an indie rock band -- but that's what developers usually call underutilized parking lots, and the suburbs are full of them.

After the war, the suburbs first developed on cheap land away from the city center, and it made sense to build only flat parking lots.

But over time, one after the other, and the result of continued chaotic expansion, they are now relatively central.

no longer makes sense

It's becoming more valuable land than using it as a flat parking lot.

In places like this, it makes more sense to build a deck and make it taller.

So what do you do in a deserted mall, in a deserted office district?

ended up doing all sorts of things

Bringing in new tenants is a good strategy in a stagnant economy.

Now, this just so happens to be a run-down mall in St. Louis, but it's been turned into an art space.

It is now home to artists' studios, theater groups and dance groups.

It's not the big tax revenue it once was, but it's contributing to the community.

keep the lights on

I think it's becoming a really great facility.

Other malls have acquired tenants as nursing homes, as universities, as diverse offices.

We also found many examples of closed stores that have been converted for all sorts of community-protecting uses, like schools, churches and libraries.

This used to be a grocery store called Foodlion, but it's now a public library.

In addition, while doing adaptive and beautiful reuse, they've ripped out some of the parking lots and replaced them with a number of sidewalks that connect neighborhoods to wetlands that collect and purify rainwater.

And they've turned what was just a row of shops on this commercial street into a community gathering place.

This is a small L-shaped shopping center in Phoenix, Arizona.

In fact, all they did was put a new bright coat of paint on and open a gourmet food store and put a restaurant inside the old post office.

Never underestimate the power of food to revitalize a place.

It's been so successful that it's even spread across the road.

And all the real estate ads in this neighborhood so proudly declare, "Le Grande Orange is within walking distance," because it provides the neighborhood with what social scientists like to call a "third place."

If home is the first place and work is the second place, then the third place is where you go to hang out and build community.

And there's a real hunger for more third places, especially in the suburbs, where there's been less concentration of families into family households.

So the most dramatic transformations actually fall into the next category, the next strategy is redevelopment.

Right now, in the midst of the boom, there's a really dramatic redevelopment plan that involves demolishing some of the original buildings, clearing the land, and then rebuilding it to a much higher density -- a kind of compact, walkable urban area.

But some of them were built in stages.

This is the oldest mod we've found on Massie Commons.

And it's built on top of a parking lot, a city plan that's been built in phases over the last 20 years.

This black-and-white photo shows a simple street shopping center in the '60s.

And the map above shows the gradual change as it became compact and became a mixed-use New England village, and it now expanded across the highway with a permit to connect to a new residential district on the other side of the highway.

sometimes step by step

sometimes all at once

This is a plan to fill another parking lot in one of our office districts outside of Washington, D.C.

When the metro line was extended into the suburbs and a station was built nearby, the owners decided to build a new parking deck, then kept the existing office building and added a new boulevard and some apartments and condominiums to the flat car park.

This is what this place looked like in 1940. It was a small farm in Hyattsville.

By 1980, it had already been divided into a large mall on one side and an office district on the other, then a buffer zone for the library and a church all the way to the right.

Today, its transportation system, its boulevards, and its new homes are being built.

Eventually, I think that street will probably extend to the redevelopment area of ​​the mall.

Plans have already been made public for plots of garden apartments on the redeveloped mall.

So transportation is a big driver of transformation.

it looks like that here

You can see new funky condominiums between office buildings and public spaces and new boulevards.

this is one of my favorite belmers

I think they've created a really attractive place here and they've used only green construction practices.

On the roof are wind turbines and giant solar panels.

This was a very large mall on a 100 acre super block.

Now there are 22 urban blocks with public streets, two public parks, eight bus routes, and several types of housing, giving downtown Lakewood, Colorado, something this suburb never had.

This is the mall in its prime

They had walking paths in the mall and they loved their mall.

This is the view of that mall in 1975.

By 1995, the mall was already deserted.

The department store has been maintained, a case seen in many places.

The department store is a multi-story building of good quality.

can be easily reused

But the one-storey

it's just a thing of the past

this is to be built

I think this plan has great potential for connectivity to existing neighborhoods.

It offers a more urban lifestyle option for 1,500 households.

About two-thirds of it is now completed.

This is the outlook for the new boulevard

It's been very successful, and it's helped spark remodels in eight of the 13 malls that are currently in or announced in the city of Denver.

But it's important to note that not all of these mods are just bulldozers coming in and just digging up the whole city.

Instead, it's a walkable alley on underutilized land.

And it gives people more choice, it doesn't take away their choices.

But it's also not enough to create walkable paths.

you want a more total transformation

We also need to remodel the streets themselves.

This is a modification being done in California.

They took the commercial street you see in the black-and-white photo below and built a tree-lined avenue that became the main street of the city.

And it transformed an ugly, dangerous, undesirable address into something beautiful, attractive, dignified and good.

Now we're about to see the results, they've already built a town hall and they've attracted two hotels.

I can imagine beautiful houses being built side by side without cutting down trees.

So there's a lot of great things out there, but I'd love to see more streets remodeled.

Densification doesn't work everywhere

sometimes regreening is a better answer

There's a lot to learn from the success of land banking schemes like the one in Flint, Michigan.

It's also a kind of home garden meets internet, a burgeoning suburban farming movement.

In fact, perhaps one of the most important aspects of regreening is the opportunity to restore local ecological environments, like this Minneapolis suburb.

When the shopping center ran dry, the city reclaimed its former wetlands and created lakeside land that attracted private investment, the first in 40 years to invest in this very low-income neighborhood.

They successfully restored the local ecology and the local economy at the same time.

Here is another regreening example

It also makes sense in a very strong market.

It's located in a mall parking lot adjacent to Seattle's new public transit stop.

And that meandering line of traffic is now a sunny path along the stream.

The creek was an underground drain for a parking lot.

And when you expose a stream to the sun, you're actually improving its water quality and contributing to its habitat.

I showed you some first generation mods.

What next?

I believe there are three challenges for the future.

The first is to plan retrofits more systematically, on an urban scale.

we really need to set a place where we should regreen

Where should we redevelop?

And where should resettlement be facilitated?

What these slides show are two images of a larger plan that's trying to do just this in Atlanta.

I led a team that was asked to envision Atlanta 100 years into the future.

And so we decided to turn the sprawl around with three expensive but simple moves.

One provides all major transportation routes and roads for 100 years

Second, a 300m buffer zone along every waterway for 100 years.

This is a little extreme, but we've had a bit of a water problem.

For 100 years, no subdivision that is simply too close to water or too far from transportation will survive.

Therefore, we have made it mandatory for land development rights to secure an eco-friendly area, and we are proceeding with the development of areas around transportation trunk lines.

So the next challenge is to improve the quality of the architectural design for this conversion.

I'm going to close with this video of democracy activity, which is in Silver Spring, Maryland, where a protest against the alterations appears to be taking place on artificial turf.

Now, retrofits are often denounced as fake downtowns and impromptu urbanism, and not without reason: there's no better deception than artificial turf.

These places are very complex places

it's new but pretends to be old

They look like urban streets, but they're suburban parking rates.

Its population is more diverse than a typical suburb, but not as much as a city.

And while it's a public space, it's managed by a private corporation.

And the look of that surface, like this artificial grass, just daunts me.

Now, I'm happy that urbanism is doing its job.

What the protests are really about is that compromising the layout of the city blocks, the streets and the layout of the city blocks and public spaces is probably still a big problem.

But we have to make architecture better.

The final challenge is for all of you

I urge you to join this protest and demand more sustainable suburban spaces.

But culturally, we tend to think and expect downtowns to be dynamic.

For the suburbs, on the other hand, I've always believed that whatever the shape of adolescence should be, it should remain the same.

Now it's time to grow the suburbs, so I'm hoping for your help with zoning changes, curbing roads, improving infrastructure, and remodeling coming to your neighbourhood.

thank you

the ocean is so complicated

The question of what is health is also complex.

It's tempting to turn a blind eye to thinking at the same time, but what I'm going to tell you is that even in the midst of all this intricacy, there are simple things that, when understood, move us forward.

Those simple things aren't complex science, they're familiar things.

First of all, from these words, if mom is unhappy, everyone is unhappy

i think i know from experience

If you understand this and start here, you should be able to move on to the next step If the sea is unhappy, no one can be happy

the theme of this speech

In many ways we make the ocean unhappy

This is "Canning Alley" in 1932

At the time, "Canning Alley" was home to the largest canning industry on the West Coast.

And accumulated vast amounts of pollutants in the atmosphere and oceans.

Rolf Bolin, a professor at the Hopkins Institute of Oceanography where I work, wrote in the '40s, "The gas rising from the sludge floating in the cove was so ugly that it blackened the paint that contained lead.

The workers at the cannery could barely make it through the day in the stench, but they said,

"Do you know what it smells like?"

"Money"

Pollution meant money there, and people endured it for money, breathing pollution into their skin and bodies.

We have made the oceans and people unhappy and robbed them of their health.

The link between the ocean and human health is based on another adage: "Pinch a small fish and a whale cries."

marine life pyramid

When ecologists think of the ocean, they see things from a very different perspective than the average person does, because ecologists see how things interact.

At the bottom of the food chain, we're going all the way to the top of the diagram to see how tiny plankton feed on organisms in the middle.

And that flow of life, the flow from the bottom to the top, is what ecologists see.

When we say "Let's save the ocean, let's make it healthy"

that's the pyramid

Well Why is it related to human health?

Because when you push something that shouldn't be at the bottom of the pyramid, something very scary can happen.

The contaminants we create, like PCBs, can't be broken down by the body.

They enter the bottom of the pyramid, drift up among the predators one after another, all the way to the top, and in doing so, accumulate.

A game to understand

just imagine

Styrofoam and chocolate game

Let's say you're on a boat, and each person is given two styrofoam peanuts.

I can't do anything, so I put it in my pocket for the time being

The rule is that every time I offer a drink, I give them peanuts along with the drink.

Then the peanuts will circle around and gather at the person who is the most stingy and drinker.

(Laughter) The indigestible peanuts pile up, pile up, and there's no gimmick.

This is exactly what happens with PCBs: they accumulate at the top of the pyramid.

Now, instead of peanuts, let's say you have this delicious looking chocolate.

Some people eat it instead of giving it away. Instead of accumulating it, it circulates among us and is consumed, so it doesn't accumulate in one place.

That's the difference between healthy natural products like omega-3s and PCBs.

PCBs accumulate

Unfortunately there are examples

PCBs accumulate in dolphins in Sarasota Bay, Texas and North Carolina

in the food chain

From plankton to fish From fish to dolphins Fat-soluble PCBs accumulate in dolphins

Now, those dolphins, there's only one way for all dolphins to get their PCBs out of their bodies.

What is it?

breast milk

Here's a chart showing PCB content in Sarasota Bay dolphins.

Male: large amount

Children: lots

Nursing females: small amounts

regardless of intention

Females pass PCBs to their offspring through breastfeeding, and those offspring do not live long.

60-80% infant mortality from first birth

Mothers pour so much pollutants into their children that they kill many.

The mother can give birth to another child, but the price to pay for this accumulation of pollutants is far too great: the death of the first child.

Another top of the marine food chain

it's human of course

we're eating meat that comes from the same place

Whale meat sold in supermarkets in Tokyo Or really?

A few years ago, we secretly set up a molecular biology lab in Tokyo, where we tested the DNA of whale meat samples to find out.

some were actually whale meat

"illegal whale meat"

that's another story

some were outright fakes

The label is false, it's actually dolphin meat

It was dolphin liver and fat.

And each of those parts contained large amounts of PCBs, dioxins, and heavy metals.

A lot of those pollutants flow into the human body.

In fact, large numbers of dolphins are sold for meat in the world's whale markets.

This fact is a tragedy not only for the dolphins, but also for the people who eat them without knowing that they are contaminated.

I discovered this data a few years ago.

I was probably the only person to know that the meat sold as whale meat is actually contaminated dolphin.

It contained 200 to 400 times the EPA standard.

I remember thinking, "This is a great scientific discovery." But it was a terrifying discovery.

For the first time in my life as a scientist, I broke the usual procedure of publishing data in a scientific journal and then giving a speech about it.

I sent a very polite letter to the Japanese Minister of Health, Labor and Welfare pointing out that the situation was unacceptable, not for us, but for the people of Japan, that breastfeeding mothers with young children might be buying tainted meat, believing it to be healthy.

This has sparked a lot of movement in Japan, and I'm proud to say that there are very few mislabeled products in Japan today.

But at least the labels are honest and you don't have to worry about buying tainted dolphin meat.

Not only in Japan, but also in the Canadian Arctic, the U.S., and the European Arctic, the diets of those regions and the diets of sea lions and whales accumulate PCBs from all over the world and carry them to them.

These women's milk is toxic

They can't breastfeed their babies because of the poisons collected by the food chain and the ocean pyramids they're part of.

their immune system is compromised

In addition, children's development is also at risk.

Over the last decade, the world has focused on this problem and made it easier for these women, not by pyramids, but by changing their diets.

I removed them from the pyramid to solve the problem.

But this solution is not the ultimate solution.

There are other ways to destroy the pyramid.

If you stuff stuff in the bottom, it will back up like a clogged sewer.

If you stuff nutrients, sewage, or chemical fertilizers into the bottom of the pyramid, it will flow back up to the top.

You know what happens, like red tides, toxic algal blooms, drifting in the oceans, causing neurological damage.

Outbreaks of bacteria and viruses can also occur.

This beach has had two red tides and contains bacteria from the genus Vibrio, including Vibrio cholerae.

Anyone seen the "Beach Closed" sign?

why do you get up

You put too much stuff in the bottom of the pyramid, and the bacteria that clog up spill over to the beach.

Mostly due to dirty water

Have you ever seen a sign like this at the entrance of a national or state park? "No entry due to domestic wastewater overflowing in the park"

Rarely, right?

Beaches are often closed, even though parks are intolerable.

The same thing is happening all over the world and this should not be tolerated.

It's not just about cleanliness, it's about how those organisms cause disease.

they actually affect people

Penetrates the skin and causes infections

Here's a graph from NOAA showing the increase in Vibrio infections in humans over the past two years.

surfers know this

What you see at surf sites is actually not only weather and wave conditions, but also manure alerts on some beaches.

It means that even with the best waves, it's still dangerous because after you've had a good time surfing, you might bring home germs that are hard to cure.

Some of them have antibiotic resistance genes that make matters worse.

That same pathogen produces harmful algae.

it creates another chemical

A brief list of toxins derived from algae outbreaks Shellfish poisoning Ciguatera poisonous fish Diarrhetic shellfish poison…I don't know it Nervous shellfish poison Paralytic shellfish poison

It's all part of the food chain, caused by algal blooms.

Rita Cowell follows an interesting story about cholera, which is introduced into human society not by humans, but by the vector Copepoda.

Copepoda is a crustacean

A fraction of a centimeter in size, they carry the disease-causing cholera bacterium in their feet.

It ignited an epidemic of cholera in ports around the world and made people wary of cargo ships carrying those vectors.

So what do we do?

The problem is the messy ecological flow, the pyramid doesn't work well, the flow from the bottom is clogged up

How do you deal with this situation?

there are a few things you can do

call the plumber joe

maybe he will come and fix it

But in fact, if you look around, you'll find not only places where you can hope for a solution, but also places where you've already figured out what the problem is and where you can work to improve it.

Monterey is one

As I said at the beginning, we've plagued the Monterey Bay ecosystem with pollution, the canning industry, and more.

This photo was taken in 1932

2009 is changing dramatically

There are no more canning factories, less pollution.

But the point is that what individual societies need is a healthy ecosystem.

I need a working pyramid

The Monterey Pyramids are now working best in the last 150 years, thanks to human efforts.

it didn't happen by accident

It's the result of the time, effort and pioneering spirit of so many people.

Pictured left is Julia Pratt, mayor of my hometown of Pacific Grove.

I became mayor at the age of 74 because I had to do something to protect the ocean.

In 1931, she set up California's first community-based marine conservation area right next to a polluting cannery. She knew that one day, when the cannery was gone, the ocean needed a place to grow, a place to sprout, and she wanted to have the seeds ready.

David and Julie Packard helped create the Monterey Aquarium and made people realize that the health of the oceans and marine ecosystems is just as important to local economies as it is to feed on those ecosystems.

That shift in perception has led to dramatic changes not just in the wealth of Monterey Bay, but around the world.

Finally, our true purpose is to protect the Pyramids of the Sea, and the ocean and our pyramids are connected.

This is an ocean planet, and we are land animals, but the pyramids of the ocean and our life on land are intricately connected.

Only by keeping the oceans healthy can we stay healthy.

thank you

applause

You're right, I always learn something here.

This morning, I believe, experts from three or four of the companies that make chairs finally came to the conclusion that people shouldn't be sitting.

I wish I could have said that

(Laughter) Yesterday I had a new insight from people in the automotive industry.

He points out that 30 to 50 years from now, driving a car will be controlled electronically, not through a mechanical mechanism.

(Laughter) This is encouraging.

(Applause) And they say that instead of getting rid of mechanical mechanisms, they're going to use wires.

It's a great story, but you want to get rid of the wires, right?

You don't need anything to use your car, just think about it.

I love talking about technology, and sometimes, like the last 15 minutes, I want to talk to the tech geeks here about what's inside this.

But if I had to tell you one thing about this, it would be when I started making it, and the technology wasn't at the heart of the idea.

Technology was central when we applied this technology to wheelchair iBOTs for people with disabilities.

But I think the heart of the idea for this is a new solution to the transportation problem.

There's just too much information on this subject that I can give you in many different ways.

I don't know who will be impressed by what, but I think everyone believes that cars have changed the world.

About 100 years ago, Henry Ford started building the Model T Ford.

But a lot of people don't think about how this technology could be applied.

For example, 91 percent of the American population at the time lived on farms and small towns.

The advent of the automobile, the horseless carriage that replaced horses and carriages, was a big deal that could move twice as fast as a carriage.

half the length

It was also an eco-friendly ride. For example, in downtown Manhattan, horses were banned in 1903. I think it's easy to imagine what would happen to the roads where millions of horses traveled.

Cars were an eco-friendly alternative to horses and carriages.

It was also the way people moved from farm to farm, farm to town, town to big town.

It was all taken for granted when 91 percent of people lived on farms.

In the 1950s, towns began to be connected by roads, what many called the eighth wonder of the world, the highway network.

and this is indeed an amazing feat

By the way, when we're talking about old technology, I want to make sure that you, especially the people in the auto industry that support us, this vehicle doesn't compete with airplanes and cars.

Just think about the state of the world today.

50% of the population lives in cities

That's the equivalent of 3.2 billion people.

We have solved all transportation problems, changed the world, and we are in this world now.

500 years ago sailing ships became practical enough that we discovered new continents.

150 years ago, steam locomotives became efficient enough to turn continents into nations.

100 years ago, we started making cars, and we spent 50 years connecting all our cities in a very efficient way, and as a result, we enjoy a very high standard of living.

But in the process, more people were born, more people moved to cities.

In China alone, 400 to 600 million people are expected to move to cities in the next 15 years.

And no one disputes that airplanes have turned continents and countries into neighbors in the last 50 years.

And if you look at how technology is used, you can say that we've solved all the problems of moving long distances, high speeds, large volumes, heavy loads.

no one will let it go

I don't want to give up planes, helicopters, SUVs and Porsches.

They're important, they're not decorations in the living room.

But the reality is that the last mile remains a problem, and now half of all people live in dense cities.

People spend between 90 and 95 percent of their energy walking, depending on the individual.

I don't know what kind of data you might be interested in, but for example, 43 percent of the fuel produced in the world is consumed by driving in urban areas in the United States.

And in cities, three million people die each year from dirty air, and most of the particulate pollution on this planet comes from transportation vehicles, especially those for urban mobility.

Again, I'm not trying to criticize any particular industry. I love airplanes, and a car that's going 60 miles an hour down the highway is very efficient from a technical standpoint, from an energy consumption and utility standpoint.

Everyone loves cars, and so do I.

But when you want to move four blocks in a city, cars aren't fun, they're not efficient, they're not productive.

not sustainable either

In 1998, 417 million people in China used bicycles and 1.7 million people used cars.

If 5% of the population became the so-called middle class, and chose to live the way we've lived for the last 100 years, but at the same time, 50% of the population moved into a city the size and density of Manhattan every six weeks, it would be environmentally unsustainable. It would be economically unsustainable.

what are we fighting for now?

You can complicate matters, but what is the world fighting over right now?

It seemed to me that someone had to solve the last mile problem. And luckily, I was developing an iBOT.

Or a snowmobile that doesn't need snow

Or skiing it's just fun people like to move around for leisure

And all of the industries you just mentioned -- golf carts alone are billion dollar businesses.

But instead of licensing it as usual, and instead of devoting all our energies to technology, I decided to use it as a way to make sense of the world we live in. Now that most of the world's problems have been solved, the city's problem remains. Since ancient Greece, urban transportation was designed to be on foot, and it's suitable for walking.

Compare the time it takes to cross the continent in a horse drawn wagon to the time it takes to travel by train or by plane.

Although almost all modes of transportation have been improved,

In 5,000 years, transportation within cities has regressed.

the city grew and spread

Among the most expensive real estate cities on this planet - Los Angeles' Wilshire Boulevard, New York's Fifth Avenue, Tokyo, Paris - the most expensive is downtown.

65% of the land area in the 20 largest cities in the world

used for parking

What if we could give urban pedestrians the same convenience they get when traveling between cities?

What if we could make it fun, attractive, clean and green?

If we could make it a little more accessible, and use it as the last link in mass transit, wouldn't we all be able to have homes in the car-friendly suburbs, and use the car for what it was meant to do, and revitalize the city?

I think it would be really cool if it could happen. was

This is technically a vehicle because it has a motor and wheels.

Doesn't really look like a vehicle

Uses the same area as pedestrians Has the ability to coexist with other pedestrians even in congestion

I took it to Ground Zero and moved it through pedestrian traffic for about an hour.

As a matter of fact, I'm a pedestrian, but the law is usually a generation or two behind technology, and if we weren't allowed to use the sidewalk, we had two options.

One is recreational rides, but I don't want to spend my time on recreational rides.

The other is moving on the roadway, running in front of greyhound buses and cars.

I was really worried about this issue, so I went to the U.S. Postmaster General, who was one of the first outsiders to put this out there, and said, "Please use this. Postal workers are trusted."

They're moving the sidewalks and they're taking this seriously for work."

The Commissioner agreed. We also went to a police station where they wanted to bring the police closer to the public. They could carry 70 pounds of equipment, and I'm sure they'd like it.

And I don't think the cops will ticket me.

(Laughter) I worked really, really hard, but I knew that developing the technology was really important, and that it wasn't as difficult as instilling how to apply the technology.

We've met investors who are farsighted enough to fund the design and development, and hopefully this will be accepted while they wait.

Really, you can talk as much as you want about this technology.

And this is really fun, so please try it.

But let me ask you one thing, don't take this as a technology, because why do we have a machine that weighs 4,000 pounds and can go 60 mph -- a machine that can go anywhere -- a machine that somehow can go the last mile -- a machine that somehow can go the last mile -- it's broken and it's not working.

The happiest thing that made me feel like this might be accepted happened here in California.

A few weeks ago, after this came out, I was riding it around Venice Beach with some people who came to interview me, and he was amazed at this technology. As the bike was zipping past the skateboard, a little old lady came up to me, literally a little old lady.

And since I have no other answer

I said, "Go ahead."

So I got off and she got on and after a little while and she got the hang of it, she turned around and moved about 20 feet and turned around again and seemed to be having a good time.

And he came back and said, "You finally made me what I wanted."

the camera caught her

I thought, "This is great." (Laughter) Please don't say anything more.

(Laughter) The camera was on her, and the film crew turned the mic to her and said, "What does that mean?"

She looked up and replied, "Well..." She kept looking up, "I can't ride a bike." "I've never skateboarded or rollerbladed."

And then he looked up and said, "I'm 81 and I don't drive anymore."

"But I have to shop, but I can't have a lot of things."

And all of a sudden, I realized that our concerns weren't just about being misunderstood by government officials, policymakers, and legislators, but what was essentially the possibility that people didn't want us to encroach on the precious space left to humans, the sidewalk.

Compared to the legal width of the sidewalk of 36 inches, the eight-foot parking lane, the three lanes and the eight feet across, the space given to the sidewalk is negligible.

But she looked up and said those words. But she looked up and said those words. I don't think kids really care.

After eight years of worrying, I stumbled upon this incident and immediately called the marketing and regulatory affairs folks, made an appointment with the National Retirement Association, and told them this.

Please allow me to introduce

And then we went to Washington and introduced this, and now they've got them involved and we're seeing how this works in some cities, for example, in trials in Atlanta, to see if this can really reinvigorate cities.

(Applause) The important thing is, if you believe the United Nations and other think tanks, over the next 20 years, global population growth will be concentrated in cities.

There are billions of people in Asia alone.

They've had cellphones since the beginning, which means-

We didn't have to follow the path that took us 100 years.

they started at the cutting edge of technology

We have to make our cities and human habitats denser, richer, greener, so that a 150-pound person can easily travel miles without a 4,000-pound machine.

Cars are badly built for parallel parking. Cars are great for traveling from city to city, but the problem of traveling long distances at high speed is already solved.

Ancient Greeks traveled from the Theater of Dionysus to the Parthenon in sandals.

you move in athletic shoes

Not much progress

If it's just three times faster than walking - three times better - then 30 minutes walking becomes 10 minutes.

So the choices you have when you're living in a city, when it's 10 minutes -- because if it's 30 minutes, you're going to choose another option, like a bus or a train, and then you need infrastructure like railroad tracks, or you want to keep your car parked.

Just put a pin on a city on a map and imagine how far you could go if you walked from there for 30 minutes.

If you can do that in a fun, eight to 10-minute period, it's hard to imagine finding a car to get around, starting it, driving it, and parking it again.

What we put our resources into, we can change the planet's energy use, and we can make it more interesting.

Someday, I hope history will prove us right.

It was the Segway. This is the Stirling engine.

This machine is now producing hundreds of watts of electricity.

And you can attach it to this thing, and you can travel from New York to Boston on a kilogram of propane gas.

The most interesting thing about this engine is that it can run on any fuel, and some people might doubt that this engine will make an impact on the world, because 120 volt power is simply not available in most parts of the world.

In fact, we've been developing this engine with Johnson & Johnson as an alternative energy source to power the iBot, because the best batteries available today are 10 watt-hours lead-acid, 20 watt-hours nickel-cadmium, 40 watt-hours nickel-metal hydride, 60 watt-hours lithium, and 8,750 watt-hours per kilogram of propane or gasoline.

But if you can burn any fuel with the same efficiency, that's great, because you're using an external fuel, just like a stove.

For example, you can create the power you need to do things like this, and that's enough power to light the night -- and run computers and lights, as Dr. Holly pointed out.

What's more interesting is that the laws of thermodynamics don't allow us to get more than 20 percent efficiency.

That's about 200 watts of power and 700 to 800 watts of heat.

To boil water to make 10 gallons of distilled water an hour, you need about 25 kilowatts of energy -- 25.3 kilowatts -- 25,000 watts of energy.

It's not rational to use this kind of energy to clean water in this country It's not rational to use this kind of energy to clean water in this country

Elsewhere in the world, you either destroy the place, burn everything you can, or just drink the water.

Dirty water is the leading cause of death in the world

The numbers vary, but anywhere from 60,000 to 85,000 people a day.

The world doesn't have sophisticated heart transplant medicine.

i need water

And don't make a woman spend four hours looking for water or watch a child die.

We've been successful in combining this with a vacuum still, which uses the heat that's wasted in the countercurrent heat exchanger, and uses a tiny fraction of the power that's produced to control it, and at 450 watts, just over half of the wasted heat, we're able to produce 10 gallons of distilled water per hour from the water used for cooling.

Years from now, when this box is here, it could solve transportation, power, communications, and even drinking water in a sustainable, 60-pound device.

I don't know if I can really do it, but I'll keep trying. It'll be over soon.

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(applause)

This conference has a lot to do with the digital revolution, but I believe the revolution is over and successful.

The digital revolution has happened, but it doesn't have to stop there.

I want to look beyond that and see what comes after that.

let's look ahead

These are the projects I'm working on right now at MIT, exploring what's next for computers.

The first is this web server called "Internet Zero," which is about the same price and complexity as an RFID tag, about a dollar, can be put in any light bulb or doorknob, and is commoditizing very quickly.

It's not the cost that's interesting, it's the way it's communicated It's not the cost that's interesting, it's the way that it's communicated.

It's akin to Morse code for the Internet, and you can communicate with light, with sound, with power lines, with radio waves.

Connecting computers to each other, connecting devices to each other, like the original idea of ​​the Internet.

"Internet Zero" takes the ideas that gave rise to the Internet to the connection of devices in the physical world.

This is the next step into a whole new world, and it's being commercialized.

And then there's the "fungible computer" project.

Substitutable goods can be split and given or traded

Half the grain is half the value, but half the baby and half the computer don't work like the whole, so I'm trying to create a replaceable computer.

What you see in the background is the prototype.