No time to find the shepherd. Instead, Borakutin rolls up his sleeves, greases his arms, and helps the sheep give birth to two new calves for the empire.

Boraktin leaves his mother's lambs and rushes back to camp.

Here the final packing is done and the vehicles are starting to line up.

This massive procession begins with 200 wagons full of the Queen and her treasures.

Then the young wife and crew, then the concubines, but only in Borakchin's camp.

This is followed by a second empire faction led by another senior lady, followed by two more factions led by wives.

Borakchin has been in contact with them for several weeks to ensure smooth departures and orderly queues.

But they only make up the royal part of the row, behind which meanders an entire civil city containing saints, families, merchants and shepherds with movable chapels and mosques.

Boractin finally settled in the wagon.

It takes weeks to reach her destination, but along the way she deftly keeps everyone from proud children and attentive minions to meandering sheep at the back of the line.

Curiosity: Blessing or Curse?

The paradoxical nature of this trait was personified by the ancient Greeks as the mythical figure of Pandora.

Legend has it that she was the first human woman, and her burning curiosity set off a series of earth-shattering events.

Pandora was inspired by Hephaestus, god of fire, and enlisted the help of her divine companions to make her special.

From Aphrodite she received the ability to express deep feelings. She learned the language from Hermes.

Athena gave great craftsmanship and attention to detail, and Hermès gave her her name.

Finally, Zeus gave Pandora two gifts.

The first was the trait of curiosity, which took root in her mind and sent her eagerly into the world.

The second was a heavy box with ornate curves, heavy to hold and tightly screwed shut.

But Zeus told her that its contents were not meant for human eyes.

She should not have opened the box under any circumstances.

On Earth, Pandora met and fell in love with the talented giant Epimetheus, who was given the task of designing the natural world by Zeus.

He worked alongside his brother Prometheus. Prometheus created the first humans, but was eternally punished for giving them fire.

Epimetheus missed his brother, but found another fiery soul in Pandora to join him.

Pandora was full of excitement about life on earth.

Her thirst for knowledge and desire to question her surroundings also made her easily distracted and impatient at times.

Often her mind wandered about the contents of the sealed box.

What treasure is so great that the human eye can never see it? And why did it come to her care?

Her fingers itched to pry it open.

At times, she was sure she heard whispers and the insides rattling inside, as if she was trying to break free.

The mystery became maddening.

As time went on, Pandora became more and more attached to the box.

There was apparently an uncontrollable force that drew her to its contents, which made her name sound louder and louder.

One day she couldn't stand it anymore.

Sneaking away from Epimetheus, she stared at the mysterious box.

One look in it and she'll be able to forget about it forever...

However, the moment the lid was first opened, the box burst open.

Huge creatures and terrifying noises erupted in clouds of smoke that swirled around her, shrieking and howling.

Frightened, Pandora desperately scratched the sky and ordered them back to prison.

But the creatures flew out on a terrible cloud.

She felt a wave of premonition as the waves rolled in.

Zeus used this box as a vessel to contain all the powers of evil and suffering he created, but once released they could no longer be contained.

While weeping, Pandora noticed a ringing sound coming from inside the box.

It wasn't the ominous whisperings of the devil, but a light tinkle that soothed her pain.

When I opened the lid again and looked inside, a warm light welled up and then faded away.

Pandora's pain eased as she watched it flash with the evil influence she had unleashed.

She knew that opening the box would be irreversible, but alongside the conflict she harbored hopes to mitigate its effects.

Today, Pandora's Box suggests the extreme consequences of tampering with the unknown, but Pandora's burning curiosity also suggests a duality at the heart of human quest.

Should we explore all we don't know and drill more into the earth, or are there some mysteries that are better left unsolved?

We all know that saving is important and should be done.

Yet, on the whole, we are doing less and less.

[How we work] We know what we have to do.

The question is how to do that.

I am here to teach you that.

Your saving behavior isn't about how smart you are or how much willpower you have.

How much we can save is determined by the impact of the surrounding environment.

Let's take an example.

We conducted a survey that showed monthly income for a group of people.

Another group showed people their weekly income.

And what we found was that people who tracked their income on a weekly basis were able to budget better for the entire month.

Now, it's important to know that it didn't change the amount of money people receive, it just changed the circumstances in which people understood their income.

And these environmental cues have an effect.

So I'm not going to share any tricks you already know.

I'm not going to tell you how to open a savings account or how to start saving for retirement.

What I share with you is how to bridge this gap between intentions and actions to save.

are you ready?

The first is to harness the power of pre-commitment.

Basically, we think of ourselves in two different ways: who we are and who we will be.

We are perfect for the future.

In the future, we plan to save for old age, lose weight, and call our parents more.

However, we often forget that our future selves are exactly the same person we are today.

We know that one of the best times to save is when you get your tax returns.

So I tried A/B testing.

The first group texted people in early February, preferably before they filed their taxes.

And we asked them, "If you get a tax refund, what percentage would you like to save?"

Now this is a really hard question.

They didn't know if they could get a tax refund or how much.

But we asked the question anyway.

A second group asked, "What percentage would you like to save?" immediately after receiving the refund.

Well what happened.

In the second condition, people wanted to save about 17 percent of their tax refunds when they just received their tax refunds.

But when people were asked before filing their taxes, the savings rate rose from 17% to 27% when asked in February.

why?

Because you're committing to your future self, of course, your future self will save you 27%.

These major changes in saving behavior are the result of changes in the decision-making environment.

We want you to be able to harness the same power.

So take a moment and think about how your future self can sign up for something that you know is a little difficult today.

Sign up for an app that allows you to make savings decisions in advance.

The point is that you need to have a binding contract.

The second is to use the moment of transition to your advantage.

We conducted an experiment using a website that helps seniors share their housing.

We ran two ads on social media targeting the same 64-year-old demographic.

One group said, 'Hey, you're old too.

Are you ready for retirement?

House sharing can help. ”

The second group was a little more specific, saying, "You will be 65 at the age of 64.

Are you ready for retirement?

House sharing can help. ”

What the second group is doing is highlighting that a transition is happening.

Emphasizing this, we suddenly saw an increase in click-through rates and, ultimately, sign-up rates.

Psychologists call this the “Fresh Start Effect”.

Whether it's the start of a new year or the start of a new season, motivation to take action is heightened.

So put a meeting request on your calendar the day before your next birthday.

Identify the one financial thing you want to do most.

And give it your all.

The third and final tip is to manage small frequent purchases.

After conducting several different studies, we found that eating out was the top regretted purchase after bank charges.

I buy it frequently almost every day, but if I cut it to pieces, I will die.

Coffee here, burrito there...

It increases or decreases our saving capacity.

When I was living in New York City, I looked into my expenses and found that I spent over $2,000 on ride-hailing apps.

That was more than my New York City rent.

I vowed to make a change.

And the next month, I spent $2,000 again, and nothing changed because the information alone didn't change my behavior.

I didn't change the environment.

So, having lost $4,000, I did two things.

The first is that I have unlinked my credit card from the car sharing app.

Instead, I linked a debit card that was only $300 a month.

If I wanted more, I had to go through the whole process of adding a new card. We know that every click, every barrier changes our behavior.

We are not machines.

We carry around an abacus every day and do not add up how much money we are spending compared to how much we would have liked.

But our brains are great at counting the number of times we do something.

So I set myself a limit.

The rideshare app can only be used 3 times a week.

As a result, travel was forced to be rationed.

Due to the change in the environment, I was able to keep car sharing costs down for my husband.

So figure out what that purchase is for you, and change your environment to make it harder.

These are my tips for you.

But remember one thing.

As humans, we can be irrational when it comes to saving, spending, and budgeting.

Fortunately, we know this about ourselves and can predict how we will behave in certain circumstances.

Let's do it while saving it.

Change the environment for your future self.

brain magic. What is Brain Magic?

To me, brain magic refers to the branch of magic that deals with psychological and mind-reading effects.

Therefore, unlike traditional magic, it uses the power of words, verbal deception, non-verbal communication, and various other techniques to create the illusion of a sixth sense.

I will show you how easy it is to manipulate the human mind once you know how.

I want everyone downstairs to join me and everyone else.

First of all, I want you to extend your hand like this.

OK, let's clap once.

OK, reverse your hands.

Now follow my actions.

About half of the audience now has their left hand raised. why is that?

OK, switch and raise your right hand.

Cross your hands so that your right hand is on top and interlace your fingers like this, making sure your right thumb is outside your left thumb. This is very important.

Yours is the other way around, so replace it.

Great, I get it. Extend your fingers like this for me.

have understood. Tap them once.

Now, all of you could do this if you would not allow me to deceive your mind.

(laughter) (laughter ends) Once you know how, you will see how easy it is for me to manipulate the human mind.

(Laughter) Now, I remember when I was about 15 years old.

And she was completely blind.

I was also able to read the banknote serial number when the banknote was placed face down on a hard surface.

Well, I was fascinated, but also skeptical.

How can we use our fingertips to read?

Practically come to think of it, if someone is totally blind, a guy did a demonstration in one of the rooms yesterday. People had to close their eyes and just hear things.

And it gets really weird when you try to figure it out.

How can we use our fingertips to read?

Well, some time ago, as part of an upcoming TV show on MTV, we attempted a similar demonstration of what is now known as Second Sight.

So let's see.

(Video) Man: Let's go.

I will guide you inside the car.

Kathryn Thomas: (laughter) Man: All right, just keep going.

KT: How are you doing?

Keith Barry: Kathryn, Keith.

Kathryn, you weren't supposed to see through that blindfold.

KT: Okay, but don't say my name like that. KB: But are you okay?

KT: Yes.

KB: Is there a way to detect that? KT: No.

KB: I will remove it.

Get rid of the rest?

Please take it off, it's okay. I will stop for a moment.

KT: I'm so scared of what I'm going to see.

KB: It's okay, take off your clothes. you're fine you are safe

Have you heard of Second Sight?

KT: No.

KB: Second sight is the ability of mind control specialists to see through the eyes of others.

and will try it now.

KT: God.

KB: Are you ready?

where is it? Impossible -- KT: (beep) KT: Whoa!

KB: Don't say anything, I'm trying to understand through your eyes. I can not see.

KT: There are walls, there are walls.

KB: Look at the road, look at the road.

KT: Okay, okay, okay. oh my god!

KB: So, do you have anything coming? KT: No.

KB: Isn't that right?

KT: No, we're still looking at the road.

I keep looking at the road.

Never take your eyes off the road.

(beep) (beep) (beep) KT: What!

KB: Where am I? Where am I?

Uphill, uphill?

KT: Look at the road -- (beep) Still blindfolded.

KB: What?

KT: How do you do that?

KB: Just don't lose focus.

But are we okay? KT: Yes.

It's so weird.

I'll be there soon. oh my god!

oh my god!

KB: And no more.

KT: That's strange.

You seem like a natural freak.

It was the scariest thing I've ever done in my life!

(Applause) KB: Thank you.

By the way, two days ago we were going to shoot this on the racecourse and we had a guy in the car with a cameraman in the back and on the way he said he got stuck in his leg I think it was 9mm.

So I quit right away and that was it.

So do you think it is possible to see through the eyes of others?

That's the problem.

Okay, but I want you to understand a few facts.

I couldn't see because I was blindfolded.

The car had not tricked or tricked me in any way.

That girl, I had never met before, okay.

So I want you to think about it.

Many people try to come up with logical solutions to what just happened.

But your brain isn't trained in the art of deception, so 99 percent of the time the solutions you come up with are irrelevant.

For example, if I don't want you to look at my right hand, I don't look at my right hand.

But if you want me to look at my right hand, I look at my right hand too.

As you know, it's very easy once you know how, but very complicated otherwise.

I'm going to do some demonstrations.

I need two people to help me urgently. Could you please come up?

So, come on down at the end, can we come here, really fast?

do you care Yes, finally.

OK, let's give them a round of applause when they show up.

It might be better to use the stairs there.

(Applause.) It is very important for everyone here to understand that I am not making any promises to you.

You never know what will happen, right?

Could you stand here for a moment?

What is your name? Nicole: I'm Nicole.

KB: With Nicole?

(phone rings) KB: Actually, here's the problem. Answer me, answer me, answer me.

(laughs) Are you a girl? Man: They're gone.

KB: OK, swap positions.

Could you please stand here? This makes it easier.

Unfortunately, I would have told them it was the Ace of Spades.

Ok, come a little closer.

(laughter) OK, come a little closer and come over here. They seem very nervous here.

do you believe in witchcraft?

Nicole: No.

KB: Voodoo? Nicole: No.

KB: Does something hit you at night? Nicole: No.

KB: And who's next, no, I see.

If you don't mind, please stand here and roll up your sleeves.

Now, it's time to experiment with voodoo, and I want you to notice different sensations around you.

I want you to be aware of the sensations, but don't say anything until I ask and don't open your eyes until I ask.

From this point on, close your eyes, say nothing, do not open your eyes, and pay attention to sensations.

Yes No Did you feel anything?

Nicole: Yes.

KB: Did you feel it? what did you feel?

Nicole: Just touch my back.

Nicole: Twice.

KB: Twice. OK, extend your left arm forward.

Extend your left arm, OK.

Yes, leave it alone.

Be aware of your sensations. Don't say anything and don't open your eyes. OK.

Did you feel anything there?

Nicole: Yes. KB: What did you feel?

Nicole: 3 -- KB: Like a tickling sensation? Nicole: Yes.

KB: Could you tell me where it is?

Ok, great. Open your eyes.

I never touched you

I just touched his back, I just touched his arm.

Voodoo experiment.

(laughter) Yes, I'll be walking around nightclubs all night.

(laughter) Just sit there.

We will use you again soon.

If you don't mind, could you sit here?

Please sit here. Man: Okay.

KB: Yes, please be seated. Great, I get it.

Now all I want you to do is look me straight in the eye. OK, take a deep breath through your nose, exhale through your mouth, and relax.

5, 4, 3, 2, 1 and close your eyes.

Please close your eyes now.

OK, I'm not hypnotizing you. It just puts you in a heightened state of synchronicity. So our hearts are along the same lines.

And as you sink, drift, float in this relaxed state of mind, I take your left hand and just place it here.

I want you to hold it there for just a moment, but only let me sink and float and float your hand back onto the table and back onto the table at the same speed and speed as you float and float in this relaxed state of consciousness.

That's it, all the way down, all the way down.

And more and more.

I want you to stick your hand firmly to the top plate.

OK, so let's leave it at that.

OK, right away, you're going to feel some kind of pressure, OK, and I want you to be aware of that pressure.

Just be careful of the pressure.

And only when you feel the pressure release, slowly lift your hands off the table top and let them come back down.

do you understand? Please answer yes or no.

Male: Yes.

KB: Wait there.

And only return your hands to the tabletop when you feel the pressure return. But only when you feel the pressure.

(Laughter) Yes, it worked. Let's try again.

wonderful. Now that you have the idea, let's try something more interesting.

Keep your eyes closed and make sure it sticks firmly to the table top.

stand? Just stand and move the stage forward.

I want you to point directly to his forehead.

Imagine the connection between you and him.

Use this upward gesture only when you want the pressure to be released.

You can wait as long as you like, but only if you want to release the pressure.

Yes, let's try again.

Point directly to his forehead.

I will try it again only if I want to release the pressure.

OK, that time it worked, it was great.

Leave it there, both of you.

Use downward gestures only when you want to release the pressure.

Wait as long as you like.

I did it pretty quickly and it fixed the problem.

Now, notice that as soon as I snap my fingers, your eyes will reopen.

It's okay to remember or forget what happened.

Most people ask, "What the heck happened here?"

But even if you're not hypnotized, it's okay to forget everything that happened.

5:00, 4:00, 3:00, 2:00, 1:00 – Open your eyes and wake up tight.

Applaud as you return to your seat.

(Applause.) Yes, you're welcome to come back.

(Applause) I once saw a movie called "The Gods Are Crazy."

Has anyone here seen that movie? Yes.

Remember when they threw Coke out of an airplane? It hit the ground but didn't break.

You see, that's because Coke bottles are solid.

Would you like to try it on?

well done. She didn't take any chances.

(Laughter) As you know, psychokinesis is the paranormal influence of the mind on physical events and processes.

Some magicians and mentalists bend or melt their spoons, others don't.

The object may or may not slide on the table.

It depends on how much energy you have for the day.

I'm going to experiment with psychokinesis from now on.

Come over here, next to me wonderful.

Now let's take a look at the Coke bottle.

Feel free to slam it onto the table if you prefer. take care.

Even though it's solid, it stands apart.

Try pinching here with two fingers and your thumb.

wonderful. Well, here's a shard of glass.

I want you to examine the shards of glass.

Be careful, sharp. wait a minute.

Please be patient here.

Now imagine a relationship that broke many years ago.

Imagine that broken relationship, all the negative energy from that man being fed into the shard of glass that represents him.

But I want you to take this seriously.

Stare into the glass and ignore everyone here.

Immediately, you will feel a sensation. got it. When you feel that sensation, drop a piece of glass into the jar.

Think about that guy, that ba, that guy.

(Laughter) We're trying to do well here.

OK, when you get that feeling, it might take a while, but drop it into the glass.

OK, put it in.

Now imagine the negative energy there.

Imagine his name, imagine him in the glass.

And I want you to shake the negative energy left and right and release it.

(laughter) (laughter) There was a lot of negative energy stored there.

(Laughter) (Applause) I want you to look at me and remember his name.

OK, let's see how many letters his name has.

The title is 5 characters.

Didn't respond to that, so 4 letters.

Think of one letter in the title.

There's a K in his name, there's a K.

I knew because my name also starts with K, but his name starts with M, not K.

was that his name? Nicole: Hmm, hmm.

KB: OK, let's give her a round of applause.

(Applause.) Thank you.

(Applause) (End of applause) There is one more thing I would like to share with you.

Actually, Chris, I was going to pick you for this, but instead of picking you, could you jump over here and pick a victim for the next experiment?

And the victim should be male, that's all.

Chris Anderson: Oh, okay.

KB: I was going to use you, but I wanted to come back for another year.

(Laughter) CA: Well, to reward you for saying "Eureka" and for choosing Michael Marcil to talk to us -- Steve Jurvetson.

KB: OK Steve, come over here.

(Applause) CA: You knew!

Well, Steve -- oh, check it out below.

They insisted that I put on a nice black tablecloth because I was a magician.

Yes, I understand.

(Laughter) There are four wooden pedestals here, Steve.

1、2、3、4。

Now, these are all exactly the same, but this one has a distinct stainless steel spike sticking out.

Please check and confirm.

Happy?

Steve Jurvetson: Well, yeah.

KB: Okay. Well, Steve, I'm going to stand at the table.Once you're at the table, place the cups on the pedestals in any order you like, and then mix them all up. That way nobody knows where the spikes are, okay?

SJ: No one in the audience?

KB: Yes, then block their view so they can't see your work.

I look away too. So let's mix them up.

OK, let me know when you're done.

(laughs) (laughs) KB: Are you done? SJ: Almost.

KB: Oh, mostly. OK, well hidden.

Oh, here's one, here's one.

(Applause.) So, okay, let's leave it at that.

(Laughs) But I'm the one who has the last laugh.

(Laughter) Well, Steve, you know where the spikes are, but no one else? Right?

But I don't want you to know, so please spin around in your chair.

They'll be watching to see if I'm doing something wrong.

No, stay there, okay.

Now, Steve, look back.

Well, you don't know where the spike is, and I don't know where it is either.

Now, is there a way to see through this blindfold?

SJ: Are you wearing this?

KB: No, but is there a way to find out? no?

SJ: No, you can't see through it. KB: Great.

Alright, let's cover up.

Do not stack. Add more mix to them.

Do not move the cup. I don't want anyone to see where the spikes are, but please mix and match the pedestals even more.

Blindfold. Add more mix to them.

No messing around this time. OK, let's mix it up.

My hands are in danger here.

(laughs) Tell me when you're done. SJ: Done.

KB: Okay, where are you? your right hand.

Please let me know when you've finished your drink.

SJ: You've had one too many drinks. KB: Have you had another drink?

SJ: Hmm, hmm.

SJ: Oh!

(laughs) KB: You said you'd laugh at the end.

(laughs) SJ: I don't think so. KB: No?

(laughter) (applause) (end of applause) Well, if you go over here, do you have another drink over here?

SJ: Can I use my left hand?

KB: Oh, no, no, no. He asked me if I could do his left hand. Absolutely not.

(laughs) KB: If I go over here, will I have another drink?

SJ: Yes. KB: Please tell me when to stop.

SJ: Okay. KB: Huh?

SJ: Yes.

KB: Okay. Do you think it's here, yes or no? This is your decision, not mine.

(laughs) SJ: I'm going to say no. KB: Good decision.

(laughter) Yes, give me your hands.

Now put it on both cups.

Do you think the spike is under your left hand or under your right hand?

SJ: Neither.

KB: Neither, oh, okay.

But if you guessed it.

(laughter) SJ: Under my right hand. KB: Under your right hand?

Now remember, you made all the decisions from the beginning.

Psychologists, please understand this.

(SJ gasps) Look.

SJ: Oh!

(Applause) KB: Thank you.

(Applause ends) If anyone wants to see the trick later, I'll go outside.

thank you.

(Applause.) Thank you.

thank you.

(applause)

"I'm glad I was on fire.

It was a special pleasure to see things being eaten, blackened and changed. Fahrenheit 451 begins in blissful flames, but before long you'll know what's going on in the flames.

Ray Bradbury's novels imagine a world where books are forbidden in all areas of life, and forbidden to be owned, let alone read.

The protagonist, Montag, is a firefighter responsible for destroying what is left behind.

But as his joy turns to suspicion, the story raises the critical question of how to keep one's mind in a society where free will, self-expression, and curiosity are under attack.

In the world of Montag, the mass media has a monopoly on information, wiping out almost all the ability to think independently.

Advertisements pop out of the walls on the subway.

Montag's wife, Mildred, listens to the radio 24 hours a day at home, and three of the walls in the drawing room are covered with screens.

At work, the smell of kerosene wafts through Montag's co-workers, who smoke cigarettes to kill time and chase rats with mechanical hounds.

When the alarm goes off, they jump out in salamander-shaped vehicles and sometimes burn entire libraries to the ground.

But day after day, like a "black butterfly," lighting his books, Montag's mind occasionally revisits the contraband hidden in the house.

Gradually, he begins to question the foundations of his work.

Ms. Montag knows she feels insecure all the time, but lacks descriptive words to express her feelings in a society where even the utterance of the phrase "once upon a time" can be fatal.

"Fahrenheit 451" depicts a world dominated by surveillance, robotics and virtual reality. This vision turned out to be remarkably prescient, but it also spoke to the concerns of the time.

The novel was published in 1953, in the midst of the Cold War.

The era saw paranoia and fear run rampant across Bradbury's home country of America, compounded by information suppression and brutal government investigations.

In particular, this witch-hunting spirit targeted artists and writers suspected of communist sympathies.

Bradbury was wary of this cultural oppression.

He believed this set a dangerous precedent for further censorship, recalling the destruction of the Library of Alexandria and the burning of books by the fascist regime.

He explored these terrifying connections in "Fahrenheit 451," titled after the temperature at which paper burns.

Its temperature accuracy has been questioned, but that doesn't detract from the novel's status as a masterpiece of dystopian fiction.

Dystopian fiction as a genre amplifies the troubling features of the world around us and makes us imagine the consequences of pushing them to extremes.

In many dystopian stories, governments impose restrictions on unwilling subjects.

But in Fahrenheit 451, Montag learns that it was public indifference that produced the current government.

The government simply used short attention spans and an irrational appetite for entertainment to destroy the circulation of ideas.

When culture disappears, imagination and self-expression follow.

Even the way people speak is short-sighted. For example, when Montag boss Captain Beatty describes the acceleration of popular culture:

Bang! Smack! Wallop, bin, bon, boom! Digest, digest, digest, digest.

Politics? One column, two sentences, a headline. And in the air everything disappears! ”

In this barren world, Montag learns how difficult it is to resist when there is nothing left to hold onto.

Overall, Fahrenheit 451 is both a portrait of an endangered independent thought and an allegory about a society complicit in its own burning.

The full scope of a nuclear explosion is almost unimaginable.

Hopefully, no one will ever experience such a tragic event again.

But there is a scientifically-backed plan of action that could save hundreds of thousands of lives in areas where nuclear explosions occurred.

So what is this plan and what exactly does it protect us from?

To create devastating explosions, these weapons harness the power of nuclear fission, the splitting of an atomic nucleus in two.

This process produces an incredible amount of energy, and in some materials, the neutrons produced by a single nuclear fission are absorbed by nearby atoms, further splitting the nucleus.

These chain reactions can produce a variety of explosive yields, but consider an explosion equivalent to 10,000 tons of TNT.

When such an explosion occurs, it creates a fireball large enough to devastate several city blocks, and a shock wave that can damage buildings kilometers away.

Tragically, nothing can be done to save those within range of the fireball.

But for those in and beyond the shock wave, a scientifically-backed protocol could save lives.

It may sound surprising, but the best way to protect yourself before, during, and after a nuclear explosion is to stay indoors.

Just as you can protect yourself from a tornado or hurricane, entering and staying in a sturdy building can protect you from the shockwave, heat, and radiation of an explosion.

A shock wave of energy travels several kilometers beyond the radius of the fireball in the first few seconds.

Any sturdy building within that range should be able to withstand the shock wave, and staying in the center or underground of these buildings will also help protect against heat and projectiles.

Finding shelter is especially important if a fireball were to occur near the Earth, as thousands of tons of dirt and debris would be drawn into the atmosphere for kilometers.

As the fireball cools, the unstable atoms produced by fission mix with the debris, creating the most dangerous long-term effect of a nuclear explosion: radioactive particles called fallout.

These sand-sized particles can emit ionizing radiation and separate electrons from molecules and atoms.

Excessive exposure to this radiation can lead to cell damage, radiation burns, radiation sickness, cancer, and even death.

Dangerous concentrations of this material, produced several kilometers up, can be carried by upper atmospheric winds, producing dangerous levels of fallout in areas up to tens of kilometers downwind.

Thankfully, the same buildings that provide blast protection are even better at protecting from fallout.

Radiation diminishes as it passes through space and mass.

So, while both broken and sealed windows have minimal effect on radiation, thick layers of steel, concrete, and rammed earth provide serious protection.

And because fallout releases half of its energy in the first hour and 80% in the first day, staying indoors for 24 hours could dramatically increase your chances of avoiding the most severe effects of radiation.

After the explosion, it will take at least 15 minutes to find shelter before the fallout begins.

The most dangerous falling particles are the heaviest, so they settle through the air and collect on roads and rooftops, making ideal shelters in basements and in the middle of tall buildings.

But there are still steps that can be taken if someone is caught in the fallout.

Once you have found a safe place, you should remove your shoes and outerwear, wash any exposed skin, and store contaminated clothing far away.

Plan to stay indoors for at least 24 hours.

If shelter is poor, or someone inside needs urgent medical attention, try seeking outside help after an hour.

But ideally, stay indoors and wait for further information from first responders.

Power, cell service, and internet will be cut, but most radios may survive.

So listen to emergency responders and decide the safest course forward.

Nuclear weapons are some of the most powerful means of destruction on earth, and it may seem simplistic to believe in such direct means of protection.

However, studies and simulations have repeatedly shown the benefits of being indoors.

So, hopefully you don't have to, but don't forget to "get inside, stay inside, and always keep your antenna up."

I want to take you back to about 7 years ago in my life.

A few days before Christmas 2009, on a Friday afternoon, I was the director of operations for a consumer products company in San Francisco when I was called to a meeting already in progress.

That meeting became my exit interview.

I was fired along with a few other people.

I was 64 at the time.

It wasn't completely unexpected.

I signed a bunch of papers, gathered my belongings and, completely oblivious, made my way to my wife, who was waiting at a nearby restaurant.

Fast forward a few hours and we were both horribly drunk.

(Laughter) And so ended 40+ years of continuous employment with companies big and small.

I had a good network and a good reputation, so I thought I would be fine.

I was a manufacturing and packaging engineer and had an excellent background.

Like many people, retirement was not an option for me. So, without any passion, I decided to do consulting for the next few years.

And ideas born out of concern for the environment began to take root.

I wanted to start my own business designing and manufacturing biodegradable packaging from waste such as paper, agricultural waste and even textile waste to replace the toxic, single-use plastic packaging we are all addicted to.

This is called clean technology, and I felt that it was very meaningful to me.

This venture could help reduce the billions of pounds of single-use plastic packaging that is dumped each year and pollutes our lands, rivers and seas, leaving the solution to future generations – our grandchildren, my grandchildren.

And now, after 40 years of experience and now at 66, I am an entrepreneur for the first time.

(Cheers) (Applause) Thank you.

But that's not all.

(Laughter) There are a lot of issues to deal with: manufacturing, outsourcing, job creation, patents, partnerships, funding - these are all typical problems for start-ups, but not typical for me.

And a word about funding.

I live and work in San Francisco, and if you're looking for funding, you're typically competing with very young people in the tech industry, which can be very discouraging and intimidating.

I have older shoes than these guys.

(laughter) Yes.

(Laughter) But five years later, we're doubling our revenue every year, we're debt-free, we have strong customers, we've got patents, we have great partners to work with from the beginning, and we're excited and proud to share with you that we've won over 20 awards for our work so far.

But best of all, we made a small dent, a very small dent, in the global plastic pollution crisis.

(Applause.) And now I have the most rewarding and meaningful work of my life.

I would say there are plenty of resources available for entrepreneurs of all ages, but five years ago, what I really wanted was to find first-time entrepreneurs my age.

I had no role models, none at all.

A 20-something app developer from Silicon Valley was never my role model.

(Laughter) I think he was very smart -- (Laughter) I want to do something about it, and I want all of us to do something about it.

I want to start talking more about people who don't become entrepreneurs until they're old.

Essentially, we're talking about daring men and women checking in when their coworkers are checking out.

And we connect all these people across industries, across regions, across countries to build communities.

As you know, the Small Business Administration says that 64 percent of new jobs created in the US private sector are thanks to small businesses like mine.

And who can say we'll stay small forever?

We have an interesting culture that expects us to play golf, play checkers, and babysit our grandchildren once we reach a certain age.

And I love my grandchildren -- (laughter) and am passionate about doing something meaningful in the global marketplace.

And I will have many companions.

The Census Bureau says there will be 84 million older people in the country by 2050.

That's a big number.

This is almost double the number today.

Can you imagine how many first-time entrepreneurs out of 84 million?

And they all have 40 years of experience.

(Laughter) So when I say, 'Let's talk more about these great entrepreneurs,' I mean let's talk about their ventures the same way we talk about much younger entrepreneurs' ventures.

Older entrepreneurs in the country have a 70% chance of starting a successful new business.

We're like the Golden State Warriors of entrepreneurs -- (Laughter) (Applause) And when it comes to young entrepreneurs, that number plummets to 28 percent.

This is from an organization called CMI based in the UK.

Aren't the accomplishments of a 70-year-old entrepreneur as meaningful and newsworthy in every way as those of a 30-year-old?

Of course it is.

That's why I want the phrase "70 over 70" to be as commonplace as the phrase "30 under 30." (smile).

(Applause.) Thank you.

(Cheers) (Applause)

When I was president of the American Psychological Association, they tried to media train me.

My encounter with CNN sums up what I'm going to talk about today, and this is my 11th reason to be optimistic.

The editors of Discover shared 10 of them. I'll give you the 11th.

So they came to me on CNN and said, "Professor Seligman, can you tell us about the state of psychology today?"

I would like to interview you about it. ”

Then she said, "But this is CNN, so you're only getting part of the audio."

I said, "So how many words did you know?"

And she said, "Well, one."

(Laughter.) And the cameras rolled and she said, "Professor Seligman, how's the psychology going today?"

"good."

(laughs) "Cut! Cut. That's no good.

It really should have provided a longer soundbite. ”

"What words can you hear this time?"

(laughter) "Dr. Seligman, what is the state of psychology today?"

"not good."

(laughter) "Look, Dr. Seligman, I can see that you're really new to this medium.

By all means, I would like you to taste the actual sound.

This time you can enter 3 words.

Professor Seligman, what is going on with psychology today? ”

"Not enough."

I want to say why psychology is good, why it's not good, and how psychology will be good enough in the next decade.

Summarizing in parallel, I would like to say the same about technology, entertainment and design. Because I think the problems are very similar.

So why was psychology superior?

Well, for over 60 years, psychology has worked within disease models.

Ten years ago, when I was on a plane and introduced myself to my friends in the seat and told them what I had done, they walked away from me. Because it's no surprise they said psychology is about finding out what's wrong with you.

And now when I tell people what I'm doing, they move towards me.

What's good about psychology—about the $30 billion NIMH investment, about research in disease models, what psychology means—is that 60 years ago, no disease was treatable. It was completely smoke and mirrors.

And today, 14 of these diseases are treatable, and 2 of them are actually curable.

And the other thing that happened was the development of science, the science of mental illness.

We found that vague concepts such as depression and alcoholism can be rigorously measured. A taxonomy of mental illnesses could be created. Understand the cause-and-effect relationships of mental illness.

We can look at the same people over time, say those who are genetically predisposed to schizophrenia, and ask how motherhood and heredity play a role, or we can isolate a third variable by conducting experiments on mental illness.

And above all, we have been able to invent drug and psychotherapy in the last 50 years.

We could then rigorously test them in a random-assignment, placebo-controlled design, discarding those that didn't work and keeping those that did.

The conclusion is that the psychology and psychiatry of the last 60 years can in fact claim to make miserable people less miserable.

And I think that's great.

However, what went wrong was the following three results.

The first was moral. Psychologists and psychiatrists have become victimologists and pathologists. Our view of human nature was that if you were in trouble, bricks would fall upon you.

And we forgot that humans make choices and decisions.

We forgot our responsibilities.

The second price is that we forgot about you.

We forgot to improve our normal lives.

We forgot about our mission to make relatively well-off people happier, happier, and more productive.

no one is working on it.

And the third problem with this disease model is that in all the rush to fix people in need, in the rush to fix the damage, there was no idea of ​​developing interventions to make people happier, positive interventions.

So it wasn't good.

And that's what led people like Nancy Etcoff, Dan Gilbert, Mike Csikszentmihalyi, and myself to work on what I call "positive psychology," and it has three purposes.

The first is that psychology should be as concerned with human strengths as it is with human weaknesses.

Just like repairing damage, attention should be paid to building strength.

You should be interested in the best things in life.

And we should be as concerned with nurturing geniuses and talents as we are with enriching the lives of ordinary people.

In the last decade and hope for the future, we have seen the beginnings of the science of positive psychology, the science of making life worth living.

It turns out that happiness can be measured in many forms.

And all of you can go to its website [www.authentichappiness.org] for free and take any happiness test.

You can ask literally tens of thousands of other people how they stack positive emotions, meaning and flow.

We created the reverse of the Madness Diagnostic Manual. It is a taxonomy of strengths and virtues, considering sex ratios, how they are defined and diagnosed, what builds them and what hinders them.

We found that we can discover positive state causality, namely the relationship between left hemisphere activity and right hemisphere activity, as a cause of well-being.

I've spent my entire life dealing with people who are extremely miserable, and I've asked myself the following questions: "How are extremely miserable people different from other people?"

And since about six years ago, we've been asking about very happy people.

how are they different from us?

It turns out, quite surprisingly, there is one way. They don't get more religious, they don't get healthier, they don't have more money, they don't look better, they don't have more good things or less bad things.

The only thing that makes them different is that they are very social.

They don't attend the seminar on Saturday morning.

(Laughter) They don't spend time alone.

They are each romantically involved and have a rich repertoire of friends.

But be careful here. This is just correlation data, not causation. And it's a story about happiness in the first "Hollywood" sense, and I'm going to talk about the happiness of cheer and laughter and cheer.

And I would like to quickly suggest that it is not enough.

We realize that we can begin to consider interventions spanning centuries, from Buddha to Tony Robbins.

About 120 interventions have been proposed that are said to make people happier.

And I found that I was able to manualize many of them, and actually performed random assignment efficacy and efficacy studies.

I mean, which one actually makes people happier on a more permanent basis?

I'll share some of the results with you in a few minutes.

But my conclusion is that the mission I am asking of psychology, in addition to its mission to cure the mentally ill, to make miserable people less fortunate, can psychology actually make people happier?

And to ask that question, I had to break it down into what I think you can ask about "happiness," even though "happiness" is not a word I use very often.

And I believe there are 3 different happy lives. I call them 'different' because different interventions build them up. It is possible to choose one instead of three different happy lives.

The first happy life is a fun life.

This is life with as many positive emotions as possible and the skills to amplify them.

The second is life with engagement. It's a life that involves work, parenting, love, and leisure. Time stops for you.

That's what Aristotle was saying.

And third, a meaningful life.

We would like to tell you a little bit about their lives and what we know about them.

The first life is a life of joy, and it is simply a matter of having as much joy as we can find, as many positive emotions as possible, amplifying them, and learning a skill to stretch across time and space: savoring or mindfulness.

But a happy life has three drawbacks, which is why positive psychology is not happiness science, and why it doesn't end here.

The first drawback is that it turns out that joyful living, or the experience of positive emotions, is about 50% genetic and, in fact, not very modifiable.

So, Matthew and I, and others know the various tricks to increase the amount of positive emotions in your life, 15-20 percent tricks to get you more positive emotions.

Second, positive emotions become habitual.

It's all like French vanilla ice cream. The first taste is 100 percent. By the time you reach the sixth taste, it's gone.

And, as I said earlier, it's not particularly flexible.

And that leads to a second life.

I have to tell you about my friend Ren. I want to talk about why positive psychology is so much more than positive emotions and more than building joy.

In two of life's three big stages, by the time he turned 30, Ren had achieved great success.

By the time I turned 20, I was an options trader.

By the time he was 25, he was a millionaire and president of an options trading company.

Second, in play, he is a national champion bridge player.

But on the third big stage of life, love, Ren is a terrible failure.

And the reason is that Ren was a cold fish.

(laughs) Ren is an introvert.

American women said when Ren dated him, "You're not funny. You don't have positive feelings. You're lost."

And Wren was wealthy enough to afford a Park Avenue psychoanalyst, and he spent five years trying to find the sexual trauma that somehow locked the positive emotions in him.

However, it turned out that there was no sexual trauma.

After all, Ren grew up on Long Island, playing football, watching football, and playing bridge.

Ren belongs to the so-called bottom 5 percent of positive emotions.

The question is, is Ren unhappy?

Contrary to psychology's view that the bottom 50 percent of humanity has positive emotions, I think Ren is one of the happiest people I know.

He has not been thrown into the hell of misfortune. That's because Ren, like all of you, is very capable of flowing.

Time stops for him when he steps onto the floor of the American Exchange at 9:30 in the morning.

Ten days after the first card is played, Ren's time stops until the tournament ends.

And this is exactly what Mike Csikszentmihalyi has been talking about about "flow."

And it differs from pleasure in a very important way. Pleasure has a raw feeling. I can see that happening. It is thoughts and feelings.

But what Mike told you yesterday was in the flow...

You are one with the music.

You have intense concentration.

And this is what we think characterizes a good life.

And we think we have a recipe for that. It's about knowing what your greatest strengths are. Again, there's a valid test for what your five greatest strengths are. And restructuring your life to take advantage of that as much as possible.

Reinvent work, love, play, friendships, and parenting.

Just an example.

I hated my job.

She is working hard towards college.

Her greatest strength was her social intelligence.

So she recreated bagging to make her encounter a social highlight of every customer's day.

Well, obviously she failed.

But what she did was take advantage of her greatest strengths and reshape her work to make the most of it.

What you get out of it is not a smile.

You don't look like Debbie Reynolds.

you don't laugh much

So that's the second pass.

First way, positive emotions. The second pass is eudaimonic flow. And the third way is meaning.

This is traditionally the most precious happiness.

And in this view the meaning consists of something very similar to eudaimonia. It consists of knowing what your greatest strengths are and using them to belong to and serve something greater than yourself.

He said that for all three kinds of lives—the happy life, the fulfilling life, and the meaningful life—people are now preoccupied with the question, “Is there anything that will permanently change those lives?”

And the answer seems to be yes.

done in a rigorous manner.

This is done in the same way drugs are tested to see what really works.

We therefore conduct randomized, placebo-controlled, long-term studies of different interventions.

Let's take a sample of the types of interventions we've found to be effective. As we teach people about having fun and how to enjoy life more, one of your challenges is to master the skills of mindfulness and savoring, and you are assigned to design a beautiful day.

Next Saturday, take a day, plan a beautiful day, and enhance your enjoyment with savoring and mindfulness.

And in that way we can show that a happy life becomes more fulfilling.

thanksgiving visit.

close your eyes.

I want you to remember someone who did something very important that changed your life for the better and you never really thanked them.

A person must be alive.

Well, you can open your eyes.

I hope you all have someone like that.

Your task when learning about a gratitude visit is to write the person a 300-word testimonial and then call the person in Phoenix and ask if it's okay to visit, but don't say why.

Show up at their door and read their testimonials. Everyone cries when this happens.

And what happens is, after 1 week, 1 month, and 3 months, when you test people, they're both happier and less depressed.

Another example is strength dating. On this date, have the couple identify their greatest strengths with a strengths test, then plan a night to play to each other's strengths.

We have found that this strengthens the relationship.

and entertainment and charity.

It's very reassuring to be part of a group like this where so many people have devoted their lives to philanthropy.

Well, my undergraduates and people I work with don't realize this, so I'm actually getting people to do something altruistic or something fun to do and contrast that.

And when you're doing something fun, you'll find a square wave walk set.

If you do something charity to help others, it will last a long time.

These are examples of positive interventions.

The penultimate point is that we are interested in how satisfied people are with their lives.

This is exactly what you are.

Then ask the question as a function of three different lives. How satisfied are you with your life?

So we ask - and we've done this 15 times, involving thousands of people. To what extent do pleasure-seeking, positive-emotion-seeking, well-being, engagement-seeking, time-stopping, and meaning-seeking contribute to life satisfaction?

And the results surprised us. They were the opposite of what we thought.

We found that the pursuit of pleasure contributed little to life satisfaction.

The quest for meaning is the strongest.

The pursuit of engagement is also very strong.

Joy is whipped cream and cherry when it has both engagement and meaning where joy matters.

That is, full life. With all three, the sum is greater than the parts.

Conversely, for an empty life that has none of the three, its sum is less than its parts.

And the question we are now asking is, are the exact same relationships the same: physical health, morbidity, longevity, productivity?

So in the enterprise, is productivity a function of positive emotions, engagement and meaning?

Is health a function of positive commitment, joy, and meaning of life?

And there is reason to think that the answer to both of them is probably yes.

So Chris said the last speaker had the opportunity to try to synthesize what he heard and that was amazing to me.

I've never seen a speaker extend so far beyond itself, and this was one of the highlights.

However, we find that the problems of psychology seem to run parallel to those of technology, entertainment and design in the following ways: We all know that technology, entertainment and design have been and could be used for destructive purposes.

We also know that we can use technology, entertainment and design to reduce misery.

By the way, the distinction between relieving misfortune and building happiness is very important.

When I first became a therapist 30 years ago, I thought that if I didn't make someone feel depressed, anxious, or angry, I could make them happy.

And I never found it. I thought the best thing I could do was go to zero. that they were empty.

And it turns out that happiness skills, joyful life skills, engagement skills, and meaning skills are different from the skills of relieving unhappiness.

So I believe the same applies to technology, entertainment and design.

So, these three things that make our world go round can make us feel happier and more positive.

And that's how it's typically been used.

But when you fragment happiness like I do, it's not just a positive emotion, it's not enough. Life has a flow, life has a meaning.

As Laura Lee told us, design, and I believe entertainment and technology, can also be used to increase meaningful engagement in life.

In conclusion, in addition to the space elevator, the eleventh reason to be optimistic is that I believe that with technology, entertainment and design, we can actually increase the amount of human well-being on Earth.

And if, in the next 10 or 20 years, technology can make life easier, better, and more meaningful, then so be it.

If entertainment can be repurposed to enhance positive emotions, i.e. eudaimony, that's enough.

And if design can enhance positive emotions, eudaimonia, flow and meaning, then what we are all doing together will be good enough.

(applause)

We survey CEOs, police officers, truck drivers, cooks and engineers.

If people are working, it's been investigated.

And what we do know, in terms of their well-being, is that workers all want the same thing.

[Our way of working] There are 3 billion working people in the world.

And about 40% of them say they are satisfied with their jobs.

That means about 1.8 billion people, or almost 2 billion people, are dissatisfied with their jobs.

What does that mean for both those people and the organizations they work for?

Now let's talk money.

Organizations with happy employees see three times more revenue than those without.

They outperform the stock market by 3x.

And if you look at employee turnover, it's half of the organizations that have the most unhappy employees.

What's miraculous is that you don't have to spend more money to make this happen.

I'm not talking about ping-pong tables, massages, or walking your pet.

It's not about perks.

It all depends on how they are treated by their leaders and the people they work with.

So I would like to introduce some ideas to create employee happiness.

Idea One: We find that there are two components to an organization with happy employees: trust and respect.

Leaders often say, "We trust our employees.

We empower our employees. ”

And if an employee needs a laptop, which is a real-world example, 15 people have to approve that laptop.

All words are true for employees, but do you need 15 levels of approval for a $1,500 laptop?

In fact, you've spent more money on approvals than you did on your laptop.

And employees feel that maybe they really don't trust them.

So how can an organization gain a high level of trust?

The first organization that comes to mind is Four Seasons.

They have great properties all over the world.

And employees are told, "Do whatever you think is right when serving customers."

Giving your employees the trust to do whatever they think is right makes them feel great.

This is why they are known for providing the best service in the world.

Idea #2: Fairness.

The fastest way to lose trust in an organization is when employees feel they are being treated unfairly.

Employees want to be treated the same as everyone else, regardless of rank, tenure, age, experience or job title.

When I think of great organizations that get fairness right, the first thing that comes to mind is Salesforce.

They found that men and women working in the same jobs with the same level of proficiency earn differently.

So they quickly calculated the difference and invested $3 million to balance it.

Idea number three is to listen.

So to become a listener who connects with all types of people, you have to learn a few things.

We've all been taught about active listening and eye contact—the intense look and the compassionate look.

I haven't heard that.

Repeating what the other person says is not listening.

Being humble, always looking for the best possible ideas, that's listening.

And employees can feel if you're doing it.

When they talk to you and share ideas, they want to know, did you consider it when making decisions?

One thing everyone appreciates and wants when they are talking is to know that what they say is important enough to actually change their minds.

Otherwise, what's the point in talking?

We all know what needs to change and what needs to change.

The way you behave, treat, respond to, and support others will determine the work experience of everyone around you.

Change to be a better person -- The world is full of such failures.

But you change because of what you believe in, the purpose you have, and it's so important to you that you're willing to risk almost everything, that's why you change.

If not, you'd be better off finding another place to work.

A fundamental problem with working in an office is that you have no control over your work environment.

[How we work] Hello, my name is Matt. CEO of Automattic, which operates WordPress.com, Jetpack and WooCommerce.

We have over 800 employees and they live everywhere from California to Alabama to Mississippi to Texas where I live.

They are also in 67 countries.

Canada, Mexico, India, New Zealand.

Some of them choose not to have a home base. they are nomads.

Whether they're in an RV or traveling with an Airbnb, they're in new places every day, week, and month.

We don't care where they are, as long as we can find good Wi-Fi.

Our emphasis on distributed work is no coincidence.

It was a conscious choice from the beginning.

Note that I didn't use the word "remote". It creates an expectation that some people are essential and others are not.

I use the word "decentralized" to describe our activity, where everyone is on a level playing field.

I believe that employee decentralization is the most effective way to build a company.

The point is that you need to approach it consciously.

When we started WordPress, many of our first 20 hires were people we had never met in person.

But we worked together online, sometimes for years.

I wanted to keep doing it for one simple reason.

I believe that talent and intelligence are equally distributed throughout the world.

But chances are not.

In Silicon Valley, big tech companies basically fish from the same small ponds and bays.

Decentralized companies can fish from all over the ocean.

Instead of hiring people who grew up in Japan and live in California, you can hire people to live, work, wake up and sleep anywhere in the world.

They bring a different understanding of the culture and a different lived experience.

Underlying the decision to decentralize is the desire to give people autonomy over how they do their work.

You can schedule yourself, as long as you don't play an important role at certain times.

Everyone has a corner office, they have windows, they can eat what they want, and they can choose when there is music and when there is silence.

You can choose the room temperature.

Spend less time commuting and more time doing what's important to you.

A distributed workforce is ideal for technology companies.

But people often ask me, "This works great for you guys, what about the rest of you?"

If you have an office, you can do a few things to build distributed functionality.

First, document everything.

Whether in the office, kitchen or hall, it's easy to make instant decisions.

But when people are working remotely and having conversations that some members of the team don't have access to, you'll see these decisions made without understanding why.

Always record where you were and what you were thinking.

This allows others to pick up where they left off.

This allows people from different time zones to interact and is also great for thinking about organizations evolving, people retiring, and people joining.

Try to communicate online as much as possible.

Once everything is shared and made public, new people will be able to catch up on the information in no time.

You also need to find the right tools.

There are many apps and services that can help you with your daily communication, video conferencing, and project management.

The thing that changed the way you work is probably not a thing anymore.

These are accessed through a computer.

So try different tools that enable collaboration and see what works for you.

Create productive face-to-face time.

In a traditional office, you're in the same place 48 weeks out of the year, sometimes three to four weeks apart.

we're trying to invert it. Team up for short, intense bursts.

Once a year, we hold a grand exchange meeting where the entire company gathers for a week.

Half work, half play.

The main goal is to bring people together.

We want everyone to be on the same page and on the same page, so they can connect more deeply with their colleagues.

Spending the rest of the year together can create a bond of understanding and empathy.

And the final practice is to give people the flexibility to create their own work environment.

All Automattic employees have a coworking space and a coworking allowance that can be used just to buy coffee so they don't get kicked out of the coffee shop.

A group in Seattle decided to pool scholarships to rent a workspace on a fishing pier.

Everyone who joins the company receives a home office allowance.

This is the amount of money you can invest to buy the right chair, monitor, and the right desk setup to create the most productive environment.

Currently, only a few companies will be distributed first.

I predict that in 10 or 20 years, 90% of the companies that change the course of the world will work this way.

As you think about what to build next, think about how you can tap into your global workforce and give them the autonomy to live and work where they feel they need to, while allowing them to fully participate in what you build together.

The decorative use of wire in southern Africa goes back hundreds of years.

But modernization has actually brought with it communication and entirely new materials in the form of telephone wires.

Rural-to-urban migration meant that newly discovered industrial materials began to replace hard-to-get native grasses.

Here we see a change in use, that is, we started using modern materials.

These works date back to the late 40's and 50's.

In the 90s, my interest and passion for transitional art forms led me to new forms emerging from the squatter camps on the outskirts of Durban.

And at that point I had the opportunity to start working with this community and really started developing and coaching the community in terms of scale and design.

And the project quickly grew from 5 weavers to 50 in about a year.

Soon the scrap yards were out of supply and we forced the wire makers to cooperate and not only supply bobbin material but also produce to color specifications.

At the same time, I also thought that there are many possibilities here to create modern products that are a little more modern, away from ethnicity.

So I developed a whole range of products around mass-produced products that fit the much higher-end decoration market, clearly exportable and able to serve the local market as well.

As you can see, we started experimenting with shapes. Scale has become so important that it has become one of our favorite projects. It has been successful and has been running for 12 years. And we also supply Conran Shop and Donna Karan, so that's great.

This is our group, the main group of weavers.

They come to Durban every week.

They all have bank accounts.

They have all returned to their native countryside.

weekly production volume.

This is the community that I showed you the slides for the first time.

And it is still modernized today, supporting the work of 300 weavers.

And the rest speaks for itself.

thank you very much.

(applause)

When I was 21, I had all my physics homework.

I need a break from my physics homework, but Wikipedia was relatively new, so I took a lot of breaks there.

I kept coming back and reading the same articles on glaciers, Antarctica and Greenland over and over again.

How wonderful would it be to be able to visit these places, and what would it take?

Well, here we are flying over the Greenland ice sheet in a repurposed Air Force freighter operated by NASA.

There's a lot to see here, but there's even more hidden and waiting to be revealed.

The Wikipedia article did not tell us that there is liquid water hidden in the ice sheets. because we didn't know it yet.

I learned from Wikipedia that the Greenland ice sheet is about the size of Mexico, with two miles of ice from top to bottom.

But it's not just static.

The ice flows downhill to the sea like a river.

If it flows around a bend, it will deform or crack.

I am able to study the dynamics of these amazing ices located in one of the most remote physical environments on Earth.

Working in glaciology today is like joining the ground floor of Facebook in the 2000s.

(Laughter) Our ability to fly planes and satellites over ice sheets is revolutionizing glaciology.

Science is just beginning to do what smartphones have done for social media.

Satellites are reporting a wealth of observations that reveal new hidden facts about the ice sheet.

For example, going back to 2002, we are observing the size of the Greenland ice sheet every month.

If you look to the bottom of the screen now, you can see the months and years advancing.

In summer, we see ice melting or ice loss in some areas of the ice sheet.

In some areas, snow falls and ice returns in winter.

But this seasonal cycle is masked by an overall rate of mass loss that would have stunned glaciologists 50 years ago.

I had no idea that ice sheets could lose mass and flow into the ocean so quickly.

The ice sheet has lost so much ice since these measurements began in 2002 that if that water were to accumulate on our smallest continent, Australia would sink to its knees.

How is this possible?

Well, there is bedrock under the ice.

We used radar to image hills, valleys, mountains and depressions where ice flows.

Hidden beneath the ice sheet is a channel the size of the Grand Canyon, channeling ice and water from Greenland into the ocean.

The reason radar can reveal bedrock is because ice is completely transparent to radar.

You can experiment.

Go home and put ice in the microwave.

Microwaves and radar travel straight through the ice without interaction, so it never melts.

Water heats up easily in the microwave, so if you want to melt the ice cubes, you have to get them wet.

That is the whole principle of microwave oven design.

You can see water on radar.

And radar revealed a vast pool of liquid water hidden seven floors below her feet, beneath her colleague Olivia.

Here, she used a pump to bring some of that water back to the surface of the ice sheet.

Just six years ago, we didn't know this glacial aquifer existed.

Aquifers form when snow melts in the summer sun and drips down.

A puddle forms in a huge pool.

From there, the snow acts as an igloo, shielding the water from the cold and high winds.

So water can be hidden in the ice sheets in liquid form every year.

The question is what happens next.

Will water stay there forever?

done.

Or will we find a way to reach the global ocean?

One possible route for water to reach bedrock and thence to the ocean is through crevasses, or cracks in the ice.

As the crack fills with water, the weight of the water causes the crack to grow deeper and deeper.

This is a hydraulic fracturing mechanism that extracts natural gas from deep within the earth.

Pressurized fluid breaks rocks.

All it takes to get started is a little bit of hard work.

Well, we recently discovered cracks in the Greenland ice sheet near this glacial aquifer.

When you fly over most of the Greenland ice sheet, you see nothing, no cracks, no features on the surface. But as the helicopter flies toward the coast, one fissure appears, then another, the path the water follows as it tries to flow downhill.

Is this fissure filled with liquid water?

If so, how deep do they pump that water?

Can it be carried to bedrock or to the sea?

Answering these questions requires more than remote sensing data.

A numerical model is required.

Create numerical models that run on supercomputers.

A numerical model is just a set of equations working together to describe something.

It can be as simple as the next number in a sequence (1, 3, 5, 7), or it can be a more complex set of equations that predict the future based on current known conditions.

What is the equation for how ice cracks in our case?

Engineers already have a good understanding of how aluminum, steel and plastic fail under stress.

It is an important issue in our society.

And it turns out that the engineering equations that describe how materials break down aren't all that different from my physics homework.

So I borrowed them and adapted them to ice to create a numerical model of how crevasses crack when filled with water from an aquifer.

This is the power of mathematics.

It helps us understand the real processes in our world.

Here are the numerical model results, but the first thing to point out is that the crevasses are about 1,000 times narrower than they are deep, so they're zoomed in here in the main panel to show more detail.

If you look at the small panel on the right you can see the actual scale of crevasse height and thinness.

When the aquifer water flows into crevasses, some of it refreezes in ice at -15 degrees Celsius.

It's as cold as your kitchen freezer.

However, if the flow from the glacial aquifer is high enough, this loss can be overcome.

That's true in our case, the water in the aquifer pushes crevasses up to the bottom of the ice sheet a thousand meters below.

From there there is a clear path leading to the sea.

So the water in the aquifer is part of the 3mm annual sea level rise we are experiencing as a global society.

But that's not all. The water in the aquifer may be punching beyond its weight.

Ice flows intricately.

In some places the ice flow is very fast.

There tends to be water at the bottom of the ice sheets here.

Not so fast elsewhere.

There is usually no water at the base there.

Now that we know that aquifer water is reaching the bottom of the ice sheet, the next question is whether the ice itself is accelerating its flow into the ocean.

We are trying to unravel these mysteries hidden within the Greenland ice sheet and better plan for the ice sheet-sustained sea-level rise.

The amount of ice that Greenland has lost since 2002 is only a fraction of what its ice sheet holds.

Ice sheets are huge, powerful machines that operate over long timescales.

Over the next 80 years, global sea levels will rise by at least 20 centimeters, and possibly by 1 meter or more.

Our understanding of future sea level rise is good, but our projections have a wide range.

It is our role as glaciologists and scientists to narrow these uncertainties.

How long will sea level rise occur and how fast will it get there?

We need to know the amount and rate so that the world and its communities can plan for future sea level rise.

thank you.

(applause)

Nearly fifty years ago, psychiatrists Richard Ray and Thomas Holmes created an inventory of the most distressing human experiences we can all have.

Number one on the list? Death of spouse.

Second is divorce. 3. Married couple separated.

Now, generally, but not always, in order for these three things to happen, you need something in number 7 on the list. it's marriage.

(Laughter) Number four on the list is institutionalization.

Now, some say the number 7 was counted twice.

(Laughter) I can't believe it.

At the time the life stress inventory was created, a long-term relationship was roughly equivalent to a marriage.

Not now.

Therefore, for the purposes of this discussion, I will include de facto relationships, common-law marriages, same-sex marriages, or preferably soon-to-be same-sex relationships.

And, as I can tell from my work with same-sex couples, the principles I'm going to talk about remain the same.

They are the same in all relationships.

Therefore, in modern society, we know that prevention is better than cure.

We vaccinate against polio, diphtheria, tetanus, whooping cough and measles.

We have awareness campaigns against melanoma, stroke and diabetes, all important campaigns.

But none of these symptoms affect the 45% of us.

45 percent: This is the current divorce rate.

Why don't we start an anti-divorce campaign?

I think it's because our policy makers don't believe that things like attraction and how we build relationships can be changed and educated.

why?

Well, our policymakers are Generation X now.

People in their 30s to 50s.

And when I talk to them about these issues, I find their eyes glaring and thinking, "Can't this crazy psychiatrist understand?"

You can't control how a person attracts other people and builds relationships. ”

No, dear millennials.

This generation is the most informed, analytical and skeptical generation, making the most informed decisions than the generation before it.

And when you talk to millennials, you get a completely different reaction.

They really want to hear about this.

They want to know how relationships can last.

So for those looking to embrace the post-“romantic destiny” era with me, let me share my three lifehacks to prevent divorce.

Now, we can intervene to prevent divorce at two points. One later, when rifts began to form in established relationships. Or even before that, before you commit, before you have children.

And that's where it takes us now.

So here's my first lifehack: Millennials spend 7+ hours a day on their devices.

It's US data.

And some say, perhaps unjustly, that this is probably affecting their face-to-face relationship.

In fact, add hookup culture, ergo apps like Tinder, and it's not all that surprising that the twenty-somethings I work with often tell me that it's often easier to have sex with someone they've met than to have a meaningful conversation.

Now, some say this is a bad thing.

I say this is really good.

It is especially good to have sex outside the institution of marriage.

Now, before you say anything moral to me, remember Gen X. A public report in the United States found that 91 percent of women had had premarital sex by age 30.

91 percent.

It is especially good that such a relationship occurs later.

Baby boomers in the 1960s married at an average age of 20 for women and 23 for men.

Australia in 2015?

Today, there are 30 women and 32 men.

This is good because the older people get married, the lower the divorce rate.

why?

Why is late marriage advantageous?

There are 3 reasons.

First, delaying marriage brings into play two other factors that prevent divorce.

They are highly educated and highly paid and tend to come with higher education.

So all three of these elements are mixed together.

Second, neuroplasticity research shows that the human brain continues to grow until at least the age of 25.

That means that until the age of 25, the way of thinking and the way of thinking will continue to change.

And thirdly, and most importantly to me, is individuality.

Personality at age 20 does not correlate with personality at age 50.

But your personality at age 30 correlates with your personality at age 50.

So when you ask someone who got married young why they broke up, they'll answer with amazing accuracy, "We got estranged." Because your 20s are a decade of rapid change and maturity.

So the first thing you want to get before you get married is your age.

(Laughter) The second one, John Gottman, is a psychologist and relationship researcher who can tell you many of the factors that correlate with a happy and successful marriage.

But what I want to talk about is a big problem. 81 percent of marriages collapse and self-destruct when this problem exists.

And the second reason I want to talk about it here is because it's something you can appreciate while dating.

Gottman found that the most stable and happy relationships in the long run were those in which couples shared power.

Big decisions like buying a house, traveling abroad, buying a car, and having kids had an impact.

But when Gottman took a closer look at the data, she found that women in general are pretty influential.

where do you think the problem is?

(Laughter) Yes, you only have two options.

Yes, we men are to blame.

Another thing Gottman found is that influential men tend to be "good fathers."

Women: How influential are your men?

Man: You are with her because you respect her.

Be respectful in the decision-making process.

number three.

I often wonder why couples who have been married for 30 or 40 years come to see me.

Now is the time when they are facing old age and disease.

It's a time when we put extra emphasis on caring for each other.

They will forgive you for what has bothered them for years.

Because of their emphasis on caring for each other, they forgive all betrayal, even adultery.

So what sets them apart?

The best words for this are 'reliability' or 'unreliability'.

Does your partner have your back?

It has two forms.

First, can you trust your partner to do what they say they will do?

Will they make it through?

Secondly, if, for example, you are out and someone is verbally attacking you, or you are suffering from a really crippling illness, will your partner step up and do what it takes to make you feel cared for and protected?

And the thing is, if you're getting old and your partner hasn't done it for you, in fact you had to do it for them, it might seem like you might be better off getting out of it than being in it in an already crumbling relationship.

So, will your partner stay by your side when it really matters?

Not always, but 80% of the time, especially if it's important to you.

For your part, think twice before deciding to do something for your partner.

It's much better to commit to doing as much as you can get through than committing to giving them a better sound at the moment and then disappointing them.

And if it's really important to your partner and you commit to it, be sure to follow through even in hellish situations.

Well, these are the things I'm saying you can look for.

please do not worry. These are also things that can be built in existing relationships.

I believe the most important decision you can make is who to choose as your life partner and who to choose as the other parent of your child.

And of course there has to be romance there.

Romance is grand, beautiful, and quirky.

But when making the most important decisions in life, we need to add an informed and thoughtful heart to our romantic and loving heart.

thank you.

(applause)

When my 91 year old mother Elia moved in with me, I thought I was serving her.

It was actually the other way around.

Mom had problems with memory loss and accepting her age.

She looked defeated.

I tried to make her as comfortable as possible, but as I was painting at my easel, I looked in and saw her there.

She wouldn't be looking at anything in particular.

I watched her slowly climb the stairs, but she wasn't the mother I grew up with.

Instead, what I saw was a frail, petite old lady.

A few weeks went by and I had to take a break from painting.

I wanted to play with my new camera that I just bought.

I was thrilled. It had all sorts of dials, buttons and settings I wanted to know about, so I blocked the only bathroom doorway in the house and set up my tripod against this large mirror.

(Laughter) After a while, you hear (mimicking an Italian accent) "I want to go to the washroom."

(Laughter) "Five minutes, Mom. I have to do this."

After 15 minutes, I heard the voice again, "I want to go to the bathroom."

"Five minutes left."

Then this happened.

(Laughter) (Applause) And this.

(laughs) And this.

(Laughter.) I thought, "Oh!" for a moment.

Connected.

We had something tangible that we could do together.

My mother was born in a small mountain village in central Italy. My parents had land and sheep there.

Her father died of pneumonia when she was young, leaving her wife and two daughters alone to carry all the heavy lifting.

It turns out they can't cope.

So a very difficult decision was made.

The oldest mother was 13 and married a total stranger who was twice as old.

She was pushed from being just a kid to being an adult.

Mom gave birth to her first child when she was only 16 years old.

A few years later, my mother, who now lives in Toronto, worked in a clothing factory and soon became the manager of a very large sewing department.

There were many migrant workers, so my mother taught herself the words from translated books.

She then practiced around the house in French, Greek, Spanish, Portuguese, Danish, Polish, Russian, Romanian and Hungarian.

I was in awe of her focus and determination to succeed at what she loves.

Later in the bathroom, "Ah!" In that moment, I practiced my newfound camera skills with my mother as a portrait model.

Through all this she spoke and I listened.

She talked about her childhood and how she feels now.

We were paying attention to each other.

My mother was losing her short-term memory, but she remembered her youth very well.

She told me the story when I asked.

I listened to her and I was her audience.

I got an idea.

I wrote them down and sketched them.

I acted out the scenario myself and showed her what to do.

Then we stage them.

There she posed and I learned more about photography.

My mother loved the process and acting.

She felt worthy again and felt needed.

And she certainly wasn't camera-phobic.

(Laughter.) (Applause.) Mom saw this and laughed hysterically.

(Laughter) The idea for this image came from an old German submarine movie I saw called Das Boot.

As you can see, what I received instead was more like "E.T."

(Laughter) So I put this image aside and thought it was a complete failure. Because it didn't reach my particular vision.

But my mom had a good laugh, so in the end, just for fun, I decided to post it online anyway.

It got an incredible amount of attention.

Now, with Alzheimer's disease and dementia, everyone involved has some level of frustration and grief.

This is mama's silent cry.

One day she said to me, "Why do you have so many things to say in your head, but before you can say them, you forget what they are?"

"Why do you have so many things to say in your head that you forget what they are before you can say them?"

(Applause.) Now, as a full-time care partner and full-time painter, I was frustrated too.

(laughs) But we played to balance all the difficulties.

It was my mother's happy place.

And I needed her to be there too.

(lol) (lol) (lol) Well, my mother was also preoccupied with aging.

She said, "How did I get old so quickly?"

(audience sighs) "It's very old."

"Very fast."

I asked my mother to be a model for my oil paintings.

This painting is called "Dressmaker".

When I was a kid, I remember my mom sewing clothes for the whole family on this huge, heavy sewing machine bolted to the basement floor.

Every night I went downstairs with my schoolwork.

I sat behind her in this overstuffed chair.

The low hum of the huge motor and the repeating stitches were soothing to me.

I kept this machine and kept it in my studio when my mom moved home.

This painting took me back to my childhood.

The interesting thing was that 50 years ago when I was sitting behind my mother watching her sew, now she is sitting behind me watching me draw her sewing on the same machine.

Also, I gave my mom a project to do to keep her busy and thinking.

I gave her a small camera and asked her to take at least 10 shots each day of whatever she wanted.

These are pictures of my mom.

She has never held a camera in her life.

She was 93 years old.

We sat together and discussed our work.

I tried to explain how and why I did it, the meaning, the emotion, why it's relevant (laughs).

Mom, on the other hand, would just say bluntly "see" "no" "Bella" "bruta".

(Laughter) I watched her expression.

Words or not, she always had the final say.

This journey of discovery did not end with Mama.

She currently lives in an assisted living facility which is a 10 minute walk from my house.

I visit her every other day.

Her dementia had reached a level where it was unsafe to stay in my house.

Lots of stairs.

She no longer knows my name.

(voice breaks) But do you know? that's ok.

She still recognizes my face and always has a big smile on her face when she sees me.

(Applause) (End of applause) I'm not taking pictures of her anymore.

It's not fair or ethical to me.

And she didn't understand why she would do such a thing.

My father, my brother, my nephew, my partner and my best friend all died suddenly.

And I didn't even get a chance to tell them how much I appreciate and love them.

With my mother, I am there and have to say a very long goodbye.

(Applause) (End of applause) For me, it's about being there and really listening.

Addicts want to feel part of something.

Sharing doesn't have to be particularly deep. It can be as simple as walking together.

Give them a voice of interaction, participation and belonging.

Spend your time meaningfully.

Life is about wanting to live, not waiting to die.

(Applause) (End of applause) Can we all get a wave and a smile?

(laughter) This is for you, Mom.

(camera click) (applause)

When I was 13, I lost my grandfather to an asymptomatic heart attack.

What was even more shocking was that my 75-year-old grandpa, who was really normal, healthy and energetic, had diabetes.

Learning all this was so painful that I decided to join the fight against this deadly killer and see what I could do.

It was shocking to discover a recent study that estimated nearly 8 million people die each year from heart attacks.

Heart attacks can occur for a variety of reasons, but most often when arteries become clogged, blood flow is cut off, and oxygen-starved cells within the heart muscle begin to die.

You may be familiar with common symptoms of a heart attack, such as chest pain, arm pain, shortness of breath, and fatigue.

However, there is a type of heart attack that is very common and equally deadly, but difficult to detect because it causes no symptoms.

People who have a silent heart attack do not seek medical attention because they are unaware of what is happening. This means you are less likely to get the treatment you need at critical moments.

And even if you happen to arrive at the hospital before or after a heart attack, you may have to undergo one or more of the time-consuming and expensive tests and treatments now considered the gold standard for heart attack diagnosis.

But of greater concern, these silent heart attacks account for nearly 45% of all heart attacks.

People with diabetes and similar disorders cannot usually feel the pain that signals a possible heart attack because of nerve damage.

So they don't know anything, they don't feel anything and they get the damage of a heart attack.

These patients who are already at risk have nerve damage and are not immediately available for treatment.

They know nothing before improbable events happen.

My grandfather was also an at-risk patient.

I researched this issue further, read as many books as I could, met with researchers, and researched across laboratories in India to understand the mind.

And finally, after three years of persistent research, today I have to share with the world a promising solution.

An inexpensive, portable, non-invasive device that can be worn by at-risk patients at any time.

It greatly reduces the need for blood tests and operates 24/7, collecting and analyzing data at preset intervals.

And all this data is collected for one purpose: detecting when a heart attack occurs.

This is a very promising solution that may come in handy in the future.

You may not yet realize how smart your mind is.

It shows symptoms such as chest pain and tries to communicate with the body multiple times before failing.

These symptoms are caused when the heart loses oxygen-rich blood flow.

But remember I talked about nerve damage.

Silence these symptoms before a silent heart attack occurs, making heart attacks even more dangerous.

And you may not even know the common symptoms.

Meanwhile, the heart pumps out certain biomarkers (proteins that are cardiac biomarkers or SOS messages) into the bloodstream in the form of SOS messages, indicating that the heart is in danger.

Concentrations of these cardiac biomarker proteins continue to increase dramatically as the risk increases.

My device relies only on this data.

Importantly, these cardiac biomarkers are found in the early stages of a heart attack, when prompt treatment almost guarantees survival.

And my device is based exclusively on that base.

And this is how my device works.

Wear the silicone patch around your wrist or place it close to your chest.

Without needing a skin prick for a biomarker blood test, the patch can find, isolate and track a heart attack-specific biomarker called H-FABP and issue an alert if it reaches critical levels in the bloodstream. This process is much simpler, easier, and cheaper than traditional heart attack diagnostic methods.

By checking biomarker concentration data, such systems are being researched in the future and could significantly reduce the need for at-risk patients to see a doctor and have blood tests for biomarkers, as the device could be worn constantly to detect biomarker elevations in real time.

Therefore, when the device senses that a biomarker level is above a critical point, it can alert an at-risk patient of imminent cardiac arrest and the need for immediate medical attention.

While the device may not provide a patient with a complete analysis of heart damage, it can be very useful in demonstrating that the patient is at risk, alerting the patient, and informing them of the importance of immediate medical attention.

All at-risk patients will be given more time to survive and seek medical help.

As a result, people no longer need expensive, invasive treatments after a heart attack.

When the device was tested in at-risk patients under observation, clinical validation test results proved to be close to 96% accurate and sensitive.

I'm going to give people two versions of my device. One provides digital analysis of biomarker levels, and a simpler version for rural populations that simply vibrates when biomarker levels cross a critical point.

If you look at advances in cardiac medicine today, it's more focused on treating disease rather than preventive self-care and technology.

We literally wait for a heart attack to occur, devoting the majority of our resources to aftercare.

But by then the irreparable damage will have already been done.

I strongly believe that it is time to rethink medicine.

We must establish proactive healthcare technology.

Change must happen now, not in 10 years or 5 years.

And hopefully, one day, with the help of these devices, no one will lose their grandfather like I did.

Thank you very much.

(Applause.) Thank you.

(Applause.) Thank you.

At this moment, every breath we take, major delta cities around the world are sinking, including New York, London, Tokyo, Shanghai, New Orleans, and my city, Bangkok.

This is the normal version of climate change.

this is mine

No big deal, just a crocodile on the road.

(Laughter) This is the immediate effect of climate change, the subsidence of cities.

Here you can see Bangkok's urbanization growing in all directions, moving from porous agricultural lands - land that can breathe and absorb water - to concrete jungles.

Here's what it looks like after 30 minutes of rain.

And every time it rains, I wish my car was a boat.

There is no room for water in this land.

It has lost its absorbency.

The reality of the Bangkok metropolitan area is a city where 15 million people live, work and commute on top of a moving, muddy delta.

Bangkok is sinking more than one centimeter per year, four times faster than the projected rate of sea level rise.

And while we may reach below sea level by 2030, that's far too soon.

It is no coincidence that I am here as a landscape architect.

When I was a child, I grew up in a tenement house next to a busy road with cars all the time.

There was a concrete parking lot in front of my house, which was my playground.

The only critters I found and enjoyed were the sneaky little plants trying to grow through cracks in the concrete pavement.

My favorite play with my friends was to dig a bigger and bigger hole in this crack and make this little plant crawl out and out.

And yes, landscaping gives me the opportunity to continue my cracked ambition to return this concrete land to nature (laughs).

In the past, Thais, my people, have adapted to the cycle of wet and dry seasons and can be said to be amphibious.

(Laughter.) We lived both on land and in water.

We were adjusting to both.

And the flood was a happy event when water fertilized our land.

But now a flood is...

disaster.

In 2011, Thailand was hit by one of the most devastating and costly flood disasters in history.

Floods have turned central Thailand into a giant lake.

Here, in the center of the image, you can see the magnitude of the flood equivalent to that of Bangkok, circled in yellow.

Water flooded from the north and flowed across several states.

Millions of people have been displaced and homeless, including myself and my family.

Some had to flee the city.

Fearing to lose their homes and belongings, many remained in the flood without electricity or clean water.

For me, the floods are a clear reflection of how modern infrastructure, especially the idea of ​​fighting floods with concrete, has made us so vulnerable to climate uncertainty.

But in the midst of this disaster, I found my vocation.

I can't sit back and wait for my city to continue to sink.

The city needed me and I had the ability to solve this problem.

Six years ago I started my own project.

My team and I won a design competition for Chulalongkorn Centenary Park.

This was the big and bold mission of Thailand's first university to celebrate its 100th anniversary by offering this land to our city as a public park.

Having parks sounds like the norm in many other cities, but not in Bangkok, which has the least public green space per capita of any major Asian city.

Our project will be the first new public park in almost 30 years.

A large green crack in central Bangkok, this 11-acre park opened just last year.

(Applause and cheers) Thank you.

(Applause.) For four years, we pushed countless meetings to convince, and never gave up, convincing that this park wasn't just for beautification and recreation, it had to help the city deal with water, it had to help the city fight climate change.

And this is how it works.

Since Bangkok is a flat city, the entire park is tilted to use the force of gravity to collect every drop of rain.

Gravity pulls the runoff down from the highest point to the lowest point.

This park has three main elements that work as one system.

The first is the greening of the roof.

This is Thailand's largest green roof, with rainwater tanks and a museum under it.

During the dry season, collected rain can be used to water the park for up to a month.

Runoff from green roofs flows down through wetlands that are home to native aquatic plants that help filter and clean the water.

And at the bottom end is a reservoir where all the water collects.

There are water bikes in this pond.

People can pedal to clean the water.

Their movement becomes an active part of the park's water system.

When life floods, people enjoy playing with water.

(Laughter) Centenary Park provides space for people and space for water. This is exactly what we and our cities need.

It is an amphibious design.

The purpose of this park is not to eliminate floods.

It's about creating a way to live with it.

And not a single drop of rain is wasted in this park.

The park can hold and collect one million gallons of water.

(Applause.) Thank you.

(Applause.) For me, every given project is an opportunity to create more green cracks in this concrete jungle, using landscape architecture as a solution. Like, for example, turning this concrete roof into an urban farm that helps absorb rain. Reduce urban heat islands and grow food in the middle of cities. Reuse abandoned concrete structures as green footbridges. And another flood prevention park at Thammasat University is almost finished with the largest green roof within an academic campus in Southeast Asia.

Severe flooding is our new normal, putting the region with the most coastline in extreme danger.

Creating parks is just one solution.

Awareness of climate change means there is an increasing imperative to understanding and addressing climate risks as part of the solution in all our professions.

Because if our cities remain as they are now, similar catastrophes will happen again...

and again.

Creating solutions in this sinking city is like making the impossible possible.

To that end, I would like to talk about a word that I always keep in mind: 'Tanjay'.

The literal translation of 'tan' means 'to stand firm' and 'jai' means 'mind'.

Keep your mind fixed on your goal.

In Thai, tanjay is placed before a word when deciding to do something. That way, you put your heart into your actions.

No matter how steep the road or how big the chasm, you push toward your goals because that's where your heart is.

And yes, Thailand is home.

This land is my one and only home and it is where my heart rests.

where are you standing

thank you.

(Applause.) Thank you.

cup head.

(applause and cheers)

Who are we?

That's the big question.

And in essence, we are nothing more than upright-walking, big-brained, super-intelligent monkeys.

this could be us

We belong to a family called Hominidae.

We are a species called Homo sapiens sapiens, and it is important to remember that in terms of our place in the world today and our future on Earth.

We are one of about 55,000 species of mammals on the planet today.

And that's just a fraction of all the species that have ever lived on Earth.

We are one of roughly 16 species of upright walking apes that have existed over the past 6 to 8 million years.

But as far as we know, aside from the bonobos, we are the only upright walking apes that exist on Earth today.

Bonobos are very human, sharing 99 percent of their genes with us, so it's important to remember this.

And we share an origin with the few extant great apes.

It's important to remember that we evolved.

I know it's a dirty word for some people, but we evolved from a common ancestor with gorillas, chimpanzees, and bonobos.

We have a common past, we have a common future.

And it's important to remember that all of these great apes have had as long and interesting evolutionary journeys as we do today.

And it is this journey that is of great interest to mankind that has been the focus of the last three generations of our family. We have been in East Africa looking for ancestral fossils to piece together our evolutionary past.

And this is how we look for them.

A group of dedicated young men and women roam the vast expanse of Africa searching for tiny bone fragments, fossil bones, that may lie on the surface of the earth.

This is just one example of what we can do while walking through the landscape of northern Kenya looking for fossils.

I don't think many in the audience will see the fossil in this photo, but if you look closely, you'll see the jaw, or lower jaw, of a 4.1 million-year-old upright walking ape found in Lake Turkana on the west side.

(Laughter) It will take a lot of time and effort, and it will involve many more people to start piecing together our past.

We don't have the full picture yet.

When we find a fossil, we mark it.

We have great technology today. I have GPS.

Mark the specimen with a GPS fix and also take a digital photograph of the specimen. This will basically bring the specimen back to the surface where it was found.

And today, all this information can be incorporated into a large GIS package.

When we find something very important, like the bones of our ancestors, we start excavating very carefully and slowly with dental picks and fine paintbrushes.

All the sediment is then passed through these sieves where it is passed again very carefully looking for small bone fragments and then washed.

And these things are so exciting. In many cases, it is the only or the first time anyone has seen the ruins.

And this is a very special moment. When my mother and I were excavating the remains of human ancestors.

And it's one of the most special things to do with mom.

(Laughter) Not many people can say that.

Now let's take you to Africa 2 million years ago.

I just want to point out that if you look at a map of Africa, the shape actually resembles a hominid skull.

I'm going to East Africa and the Rift Valley.

Basically, it goes upstream from the Gulf of Aden or downstream to Lake Malawi.

And the rift valley is a depression.

This is a basin, and rivers flow from the highlands into the basin, carrying sediment and preserving the bones of the animals that lived there.

If you want to become a fossil, you have to actually die where your bones are quickly buried.

And I hope that the earth will move in such a way as to bring the bones back to the surface.

And you're hoping one of us will walk around and find a little piece of you.

(Laughter) Well, it's absolutely amazing that we know so much about our ancestors today. Because it's incredibly difficult for these things to be preserved, that is to be preserved, and secondly, for them to be brought back to earth.

And since we've only really spent 50 years exploring these ruins, we're really starting to piece together the story of our evolution.

So let's go to Lake Turkana, one of the northernmost such lake basins in our country Kenya.

Looking north here, there is a large river that flows into the lake, carrying sediment and preserving the remains of the animals that lived there.

About 20,000 square miles of this lake basin is lined with fossil sites on both sides.

That's a big task we have.

Two million years ago, Lake Turkana was actually inhabited by one of our ancestors, Homo erectus.

See some of the major fossil sites we've studied in the north. But in essence, two million years ago, Homo erectus, far right, lived alongside three other human ancestors.

And this is the skull of Homo erectus. I just took it off the shelf.

(Laughter) But I'm not saying that being a single species on Earth is the norm.

In fact, going back in time, it is common for more than one species of hominids or human ancestors to coexist at any given time.

where did these come from?

It's something we're still trying to find answers to, and it's important to recognize that all different species have diversity, and our ancestors were no exception.

Below is a reconstruction of some of the fossils found in Lake Turkana.

But I grew up in Kenya and was very lucky to basically accompany my parents to Lake Turkana to look for human bones.

And when we were old enough, we were able to unearth fossils of crocodiles with narrow snouts like this one.

And we dug up giant tortoises and elephants.

But when I was 12 years old, there was a very exciting expedition in the West, as you can see in this photo, and this Homo erectus skeleton was essentially discovered.

I was the same age he was when he died, so I was very sympathetic to this Homo erectus skeleton.

And I imagined him to be tall and dark-skinned.

His brothers were certainly able to run long distances in pursuit of their prey, and probably sweated profusely while doing so.

He was very good at using stones effectively as tools.

And this man himself, the man I'm holding up here, actually had a bad back. Perhaps he was injured as a child.

He had scoliosis, so by the time he was 12 years old, he must have been under the close attention of other women in his family, and perhaps much smaller ones.

Unfortunately, he fell into the swamp and could not get out.

Basically, his bones were quickly buried and beautifully preserved.

And he stayed there until 1.6 million years later, this very famous fossil hunter, Kamoya Kimu, was walking along a small hillside and found a small part of his skull dropped on the surface among the pebbles, and recognized it as hominid.

It's actually a small piece on top of this.

Well, excavations soon began, extracting more and more small fragments of skulls from the deposits.

And this is what was so interesting. The skull fragments were getting closer and closer to the base of the tree, and it was only recently that the tree had grown, but I noticed that the skull was getting good water on the hillside and decided to grow roots in and around it to hold the tree in place and keep it from being swept up the slope.

We started finding limb bones. We found finger bones, pelvic bones, vertebrae, ribs, clavicle, and other things never seen before in Homo erectus.

I was really excited.

He had a body very similar to ours, and he was about to become human.

Shortly thereafter, members of Homo erectus began to migrate north from Africa, and Homo erectus fossils began to appear in Georgia, China, and parts of Indonesia.

So Homo erectus was the first human ancestor to leave Africa and begin to spread around the world.

As I mentioned earlier, there were some interesting discoveries from Dmanisi in the Republic of Georgia.

But also recently, a surprising discovery was announced from the Indonesian island of Flores. There, these ancestral groups of humans are isolated and dwarfed, measuring only about one meter in height.

But they lived only 18,000 years ago, which is really amazing when you think about it.

Putting this in terms of generations, Homo erectus left Africa 90,000 generations ago because humans have difficulty thinking about time.

We essentially evolved from an African lineage.

Once again, it takes about 200,000 years for us to become full-fledged.

And we left Africa about 70,000 years ago.

And until 30,000 years ago, at least three upright-walking apes were shared on Earth.

The question here is who are we?

We are certainly a polluting, wasteful, and aggressive species, but perhaps we are throwing in some good stuff.

(Laughter) Most of the time we're not particularly fun.

We have much larger brains than our ape ancestors.

Is this a good evolutionary adaptation, or will it lead us to become the shortest-lived human species on Earth?

And what is it that really makes us who we are?

I think it's our collective intelligence.

It's our ability to write things down, our language, our consciousness.

In its very primitive beginnings a very crude toolkit of stone was used, but now we have a very advanced toolkit and the use of tools has reached a truly unprecedented level. We have mapped the human genome. And recently, even artificial life has been created thanks to Craig Venter.

We have also succeeded in communicating with people from all over the world and from special places.

Even from the excavations in northern Kenya, we can tell people about what we do.

As Al Gore vividly reminded us, we are reaching an extraordinary number of people on this planet.

Looking at the fossil record, our ancestors could actually only survive on Earth for an average of about one million years at a time.

We're only 200,000 years old as a species, but we've reached over 6.5 billion people.

And last year, our population increased by 80 million.

So this is an unusual number.

This is also a quote from Al Gore's book.

But what has happened is that our technology has removed the checks and balances to population growth.

We have to manage the numbers and I think this is as important as anything else going on in the world today.

But we as a species cannot maintain populations, so we have to manage populations.

My father aptly said, "Humans are certainly the only animals that consciously choose to be bad for their survival as a species."

Can we do it together?

It's important to remember that we all evolved in Africa.

We all have African origins.

We have a common past and share a common future.

Evolutionarily speaking, we are only a fraction of a second.

We're sitting on the edge of a cliff, but we have the tools and technology at hand to tell us what we need to do to keep things going today.

You can tell everyone there if you really want to.

But will we do that, or will we let nature take its course?

Well, ending on a very positive note, I think this is probably pretty good in the end, evolutionarily speaking.

I will keep it this way, thank you.

(applause)

So today we're talking about collecting stories in unconventional ways.

This is a picture of me at a very awkward stage in my life.

Enjoy our awkwardly tight cut-off pajama bottoms with balloons.

It was a time when I was mainly interested in collecting fantasy stories anyway.

Here is a picture of me holding one of my first watercolor paintings.

And these days, I'm much more interested in collecting stories from reality, real stories.

Specifically, I'm interested in collecting stories about myself, stories on the internet, and more recently life stories. This is a new area of ​​work that I have been working on recently.

So today I will talk about each of them.

So, let me start with my own story. These are my two sketchbooks.

I have a lot of these books and have kept them for the last eight or nine years.

They accompany me wherever I go in life, and I stuff them with all sorts of things—records of my lived experiences. Watercolours, paintings of what I saw, dead flowers, dead insects, ticket stubs stuck together, rusty coins, business cards, writing, etc.

And in these books I get short, tiny glimpses of the moments and experiences and people I met.

And, you know, after years of keeping these books, I became very interested in collecting other people's artifacts, not just my own.

So I started collecting what I found.

Here's a photo that fell into a New York City gutter about ten years ago.

On the front is a tattered black-and-white photo of a woman, and on the back is the 'To Judy, the girl with the voice of Bill Bailey.

Have fun with whatever you do. ”

And I really liked this idea of ​​a partial glimpse into someone's life.

Instead of knowing the whole story, know a little bit of the story and fill your head with the rest.

And the idea of ​​a partial glimpse is something that comes back in many of the pieces I'll show you later today.

So, around this time, I was studying computer science at Princeton University, and suddenly realized that I could collect these kinds of personal relics not just from street corners, but from the Internet.

And suddenly, all at once, people are leaving vast numbers of digital footprints online that speak to their private lives.

Blog posts, photos, thoughts, feelings, opinions, all these were expressed and left a mark by people online.

So I started writing a computer program to study very large online footprints.

One such project has been around for about a year and a half.

Its name is "We Feel Fine".

This is a project that scans the world for newly posted blog entries every 2-3 minutes, looking for occurrences of the phrases "I feel" and "I feel". Then, when it finds one of those phrases, it retrieves the full text up to that period and also tries to identify demographic information about the author.

That is, their gender, age, geographic location, and what were the weather conditions at the time the text was written.

It collects about 20,000 such sentences per day, has been running for about a year and a half, and now has over 10.5 million sentiments.

It is displayed like this.

These dots here represent some of the sentiments of the English-speaking world over the past few hours, each dot being a single sentence said by a single blogger.

And the color of each dot corresponds to the kind of emotion in your heart, bright ones are happy and dark ones are sad.

And the diameter of each dot corresponds to the length of the sentence inside.

That is, smaller ones are shorter and larger ones are longer.

"I feel fine with my body now, but I can't easily excuse why I still feel uncomfortable being around my boyfriend," said a 22-year-old Japanese woman.

"I got this at a neighborhood deal, but I really hate messing with wiring and trash."

The blog post also includes a photo as part of the review.

Then, a montage work that combines text and images is automatically created.

And any of these can be opened to reveal the text inside.

"i feel good."

"I'm sick now and probably 100,000 pounds overweight, but it was worth it."

“I love how they have been able to best preserve everything that makes us feel close to nature: butterflies, plantations, limestone caves, and even giant pythons.”

Therefore, the next move is called mob.

This allows us to look at things a little more statistically.

This shows the most common emotions in the world at the moment, dominated by good emotions, then bad emotions, then good emotions, then guilt, etc.

Weather forces the emotion to assume the physical characteristics of the weather it represents. Sunny swirls, cloudy drifts, rain pours down, snow falls to the ground.

You can also stop the raindrops and release your inner mood.

Finally, the location will move the emotion to that location on the world map, giving you a geographical distribution of the emotion.

Here are some of my favorite montages from 'We Feel Fine'.

These are images that are built automatically.

"I feel like I'm diagonally parked in a parallel world."

(Laughter) "I've kissed a number of other boys and it didn't make me feel good. Kissing felt dirty and wrong. But kissing Lucas feels beautiful and almost spiritual."

"I can feel the cancer growing."

"I feel beautiful."

"I feel like I've lost weight, but I really haven't."

"I'm 23 and recovering from my meth and heroin addiction and I feel really happy to be still alive."

“I can’t wait to see them race for the first time at Daytona next month because we feel the need for speed.”

(Laughs) "I feel cocky."

"I feel very sexy when I wear this new wig."

As you can see, "We Feel Fine" is a very small collection of personal stories.

Sometimes there are short stories of two or three words.

So it even challenges the notion of what counts as a story.

And recently, I've become interested in digging deeper into a single story.

That's why I started working with the physical world instead of the internet, using the internet as a presentation medium only at the last moment.

So these are actually new projects that haven't been published yet.

The first of these is called "Whale Hunt".

Last May, I spent nine days with an Inupiat Eskimo family in Barrow, Alaska, the northernmost settlement in the United States, documenting the annual spring whale hunt.

This is the whaling camp. We are about 9 miles from shore, camping on 5.5 feet of thick frozen floe ice.

And that water you see there is an open reed through which bowhead whales migrate north each spring.

And the Eskimo community basically camps here on the edge of the ice and waits for the whales to attack. And when that happens, it throws a harpoon at the whale, then pulls it under the ice and chops it up.

And it will provide a long-term food supply for the community.

So I went there, lived with them in a whaling camp here, and photographed the whole experience, starting with a taxi to Newark airport in New York and ending with the slaughter of a second whale seven and a half days later.

I photographed the entire experience at five minute intervals.

So I took a picture every 5 minutes.

When I woke up, I had the camera hanging from my neck.

When sleeping with a tripod and a timer.

And in adrenaline-pumping moments, like when something exciting happened, I increased the frequency of taking photos to 37 in 5 minutes.

So what this created was a faster and slower photographic heartbeat that more or less matched the pace of my own heartbeat change.

That was the initial concept here.

The second concept was to use this experience to think about the basic building blocks of any story.

What constitutes a story?

In other words, stories have characters. Stories have concepts.

A story takes place in a specific region. They have context.

they have colors. what do they look like?

they have time. When did it happen? Date -- When did it happen?

And for whaling, this is also an excitement level idea.

But when it comes to stories, in most of the existing mediums we are accustomed to – novels, radio, photography, movies, even lectures like this one – we are very accustomed to the idea of ​​a narrator or camera position, some sort of omniscient external body that sees the story through its eyes.

We are so used to this.

But when you think about real life, that's never the case.

So in the real world, things are much more nuanced and complex, and all these overlapping stories intersect and touch each other.

So I thought it would be interesting to build a framework for surfacing those types of stories. So, in the case of Whale Hunt, how can we distill something like Simeon and Crawford's tale of wild animals, tools, and blood that took place around 10:00 am on May 3, when the excitement was running high in the red-dominated Arctic Ocean?

So how do we extract this narrative order from this big narrative?

I built a web interface to display "The Whale Hunt" to do exactly this.

So these are all 3,214 photos taken there.

This is my studio in Brooklyn. This is the Arctic Ocean, seven days after the second whale slaughter.

Here you can see some of the stories told in color.

So this red strip represents the color of the wallpaper in my basement apartment.

And when you go out to the Arctic Ocean, the area becomes pure white.

This is an introduction to Reddown when dismantling a whale.

See exciting moments throughout the story on the timeline.

They are organized chronologically.

Wheel offers a slightly more playful take on this, so these are also all photos in chronological order.

Clicking on any of these will enter the story at that position.

So now I'm sleeping on the plane to Alaska.

That is "white whale".

Here is the food we ate.

It's in the living room of the Patkotak family in Barrow. The boxed wine they provided us.

Cigarette break outside -- I don't smoke.

This is a really exciting sequence for me to sleep on.

This is the Arctic Whale Camp.

The graph I'm clicking here is reminiscent of a medical heart rate graph, which shows moments of adrenaline rush.

The ice is starting to freeze here. The snow fence they made.

So this time, I will introduce a function that draws out substories.

So let me introduce the cast. These are everyone who participated in the "whale hunt" and the two whales killed here.

And you can do whatever you want, for example extracting Ronnie's story involving the concept of blood, whales and tools, which took place in Akiugaku camp in the Arctic Ocean, at a high heart rate level.

And now you can narrow that entire story down to 29 matching photos and enter the story from that position.

Here we see Ronnie butchering a whale.

These whales are about 40 feet long and weigh over 40 tons. And they provide a food source for the community for most of the year.

Jumping a little further here, this is Ronnie on a whale carcass.

They don't use chainsaws or anything like that. It's completely just a blade, an incredibly efficient process.

Here are the men holding on to the ropes and pulling the carcasses out.

This is a muktuk, or fat, lined up for community distribution.

It's a mustache. Move on.

So what I'm going to tell you next is very new. It's not even a project yet.

So just yesterday I flew in from Singapore, having previously spent two weeks in Bhutan, a small Himalayan kingdom located between Tibet and India.

There I was doing a project about happiness and I was interviewing a lot of local people.

So there is something very odd about Bhutan that most of its high-level government decision-making is based on the concept of Gross National Happiness rather than Gross Domestic Product, and has been doing this since the 70s.

And that leads to completely different values.

It's an incredibly non-materialistic culture where people don't have much but are incredibly happy.

So I went around and talked to people about some of these ideas.

So I did a lot of things. I asked people a few fixed questions, took some pictures, interviewed them with audio, and took pictures.

First, ask people to rate their happiness on a scale of 1 to 10, which is inherently irrational.

And when they answered, I inflated that number of balloons so that they would have that number of balloons.

So there are really happy people with 10 balloons and really sad people with 1 balloon.

But you know, just having one balloon makes me happy.

(Laughter.) And I asked them a lot of questions, like what was the happiest day of their lives and what makes them happy.

And finally, make a wish.

And when they made a wish, I wrote a wish on one of the balloons and took a picture holding it.

So here are some quick excerpts from some of the interviews I did, some of the people I spoke to.

This is an 11 year old student.

He was running around town playing cops and robbers with his friends, all of whom had plastic toy guns.

His wish was to become a police officer.

He started work early. it was his hand.

I took pictures of everyone's hands because I think you can tell a lot about a person by their hands. We took portraits of everyone and asked them to make funny faces.

I am a 17 year old student. Her wish was to be born a boy.

She believes that women are treated quite harshly in Bhutan, but boys are much easier.

A 28-year-old mobile shop owner.

If you know what Paro is like, you'll understand how amazing it is to have a mobile phone shop.

He wanted to help poor people.

I am a 53 year old farmer. She was picking wheat, but the pile of wheat behind her took about a week to make.

She wanted to continue farming until the day she died.

Here you can actually see the stories told by the hands.

She was wearing a silver ring with the word "love" engraved on it, which she had found on the street.

16 years old working in a quarry.

This man was smashing rocks with a hammer in the hot sun, but he just wanted to live his life as a farmer.

21 year old monk. he was very happy

He wanted to live a long life in a monastery.

A mole on the left side of his face grows an amazing string of hairs, which is said to be very lucky.

He was a little too shy to make funny faces.

I am a 16 year old student.

She wanted to be an independent woman.

When I asked her about it, she said it meant she didn't want to get married. Because, in her opinion, marrying in Bhutan as a woman denies you the chance to lead an independent life. That's why I wasn't interested in getting married.

24 year old truck driver.

He was driving one of the terrifyingly huge Indian trucks that rolled down a two-lane road with a 3,000-foot drop just beside it.

But all he wanted was to live a comfortable life like everyone else.

A 24-year-old street sweeper. I caught her lunch break.

She had a small fire next to the road to keep warm.

Her wish was to marry someone who had a car.

She wanted to change her life.

She lived in a small workers' camp right next to the road and wanted things differently.

An 81-year-old migrant farmer.

I saw this man on the side of the road, but he doesn't actually have a house.

He travels from farm to farm every day to find work and tries to sleep wherever he gets a job.

So his wish was to come with me and secure a place to live.

He had a great knife and when I asked him to make a funny face, he pulled it out of his pocket and started swinging it around.

Everyone was friendly.

10 years old.

He wanted to go to school and learn to read and write, but his parents didn't have enough money to send him to school.

He kept dipping his fingers in this orange sugary candy and eating it, but there was so much saliva on his hands that this orange paste started forming on his palms.

(laughs) 37 year old road worker.

One of Bhutan's most sensitive political themes is to use cheap Indian labor imported from India for road construction and to send people home once the roads are built.

So they were working one morning as part of a crew mixing asphalt on the side of a highway.

His wish was to earn money and open a shop.

I am a 75 year old farmer. She was selling oranges by the roadside.

When I asked her about her wishes, she said: "Maybe I live, maybe I die, but I have no wishes."

She had been chewing betel nuts, which caused her teeth to become very red over the years.

Finally, this is the 26-year-old nun I spoke to.

Her wish was to make a pilgrimage to Tibet.

When I asked him how long he was going to live in the nunnery, he said, "Well, of course it's impermanent, but I'm going to live here until I'm 30, and then go into a hermitage."

So I said, "Is it like a cave?" And she said, "Yes, it's like a cave."

And I said, "Wow, how long are you going to live in a cave?"

And she said, "Well, I want to live in a cave for the rest of my life."

I thought that was amazing. I mean, the way she spoke, the amazing English, the amazing humor, and the amazing laughter made me feel like someone you might run into on the streets of New York or my home state of Vermont.

But she has lived in the nunnery for the last seven years.

I asked her a little more about the cave. And I asked her what was going to happen if she went there.

What would she do with the next 35 years of her life if she knew the truth after only one year?

and she said:

Woman: I think I'll stay until I'm 35. Maybe you will die.

Jonathan Harris: Maybe I'll die? Woman: Yes.

JH: Ten years? Woman: Yes, yes. JH: Ten years is a long time.

Woman: Yes, you may die in ten years, not one year, or one year.

JH: Are you looking forward to it?

Woman: Oh, because it's impermanent.

JH: Yes, but -- yes, I understand. Would you rather live in a cave for 40 years or one year?

Woman: But I probably like 40-50 years old.

JH: Around 40-50? yes.

Woman: Yes. From then on, I will go to Heaven.

JH: Well, good luck.

Woman: Thank you.

JH: I hope it's all you want.

Once again, thank you very much.

Woman: You're welcome.

JH: So, if you get it, she said she wanted to die around 40. Life was enough for her.

So what we did in the end, very quickly, took all the wish balloons, 117 interviews, 117 wishes. We then took it to one of Bhutan's most sacred sites, the Dochula mountain pass at an altitude of 10,300 feet.

And there are thousands of prayer flags that people have spread over the years.

Then we re-inflated all the balloons, tied them to strings and hung them between the prayer flags.

And they actually fly there today as well.

If you are planning a trip to Bhutan in the near future, please check it out. Here are some images in it.

We chanted the nembutsu to make all these wishes come true.

Here we begin to see some familiar balloons.

"To make money and open a shop," said an Indian road worker.

Thank you very much.

(applause)

“To do two things at once is to do neither.”

That's a nice slap in the face of multitasking, isn't it? Often attributed to the Roman writer Publilius Schloss, you know what these things are like, but he probably never said it.

But I'm curious if it's true.

So this obviously applies to emails at the dinner table, text messages while driving, or live tweets in TED talks.

But I would argue that in important kinds of activity, doing two things, or three, or even four things at the same time is exactly what we should be aiming for.

Look no further than Albert Einstein.

In 1905 he published four remarkable scientific papers.

One of them was about Brownian motion, which provided empirical evidence for the existence of atoms and explained the basic mathematics behind most of financial economics.

The other was about special relativity.

The other is about the photoelectric effect, which is why solar panels work, and they're great.

gave him the Nobel Prize for this achievement.

And the fourth introduced an equation that you may have heard of. E is equal to mc squared.

So tell me again how not to do more than one thing at a time.

Now, obviously, working on Brownian motion, special relativity, and the photoelectric effect at the same time isn't exactly the same kind of multitasking as snapchatting while watching "Westworld."

Very different.

And Einstein, yes, yes, Einstein's – he's Einstein, he's the one and only, the one and only.

But Einstein's pattern of behavior is not entirely unique.

This is very common among highly creative people, such as artists and scientists, and I like to call it "slow-motion multitasking."

Slow-motion multitasking feels like a counterintuitive idea.

What I'm talking about here is working on multiple projects at the same time and jumping back and forth between topics depending on my mood and situation.

But the reason it seems counterintuitive is that we are so used to falling into despair that we multitask.

I'm in a hurry, so I want to do everything at once.

If you're looking to slow down your multitasking, you might find it works quite well.

Sixty years ago, a young psychologist named Bernice Eidelson began a long-term research project investigating the personalities and work habits of 40 leading scientists.

Einstein was already dead, but four of her subjects, including Linus Pauling and Richard Feynman, were awarded Nobel Prizes.

The research continued for decades, in fact even after the death of Professor Aderson himself.

And one of the questions this paper answered was, "How are some scientists able to continue doing important research throughout their lives?"

What about these people?

Is it their personality, their skill set, their daily routine?

Well, the pattern that emerges is clear and may surprise some.

Leading scientists kept changing the subject.

They changed topics repeatedly by the time they published their first 100 research papers.

Want to guess the frequency?

3 times?

five times?

no. On average, the most original scientists switched topics 43 times in their first 100 research papers.

The secret to creativity seems to be multitasking in slow motion.

Idason's research suggests we need to bring back multitasking and remind ourselves of how powerful it can be.

And she's not the only one to find this out.

Different researchers, using different techniques, have studied different highly creative people and found that they very often have multiple projects going on at the same time, and that they are far more likely to have more serious hobbies than most of us.

Multitasking in slow motion is common among creative people.

why?

I think there are three reasons.

And the first one is the simplest.

Creativity often happens when you take an idea out of its original context and move it elsewhere.

Spending time moving from frame to frame makes it easier to think outside the box.

As an example of this, consider the original Eureka moment.

Archimedes -- He's grappling with a difficult problem.

And he realized that he could take advantage of water displacement to solve it instantly.

If the story is to be believed, the idea came to him while he was submerging himself in the bath and watching the water rise and fall.

And if solving problems while taking a bath isn't multitasking, then I don't know what multitasking is.

A second reason multitasking works is that learning how to do one thing well often helps you do something else.

Any athlete can talk about the benefits of cross training.

It is also possible to cross-train the mind.

Several years ago, researchers enrolled 18 randomly selected medical students on a course at the Philadelphia Museum of Art, where they learned to critique and analyze works of visual art.

And at the end of the course, these students were compared with a control group of other medical students.

And those who took art courses became significantly better at tasks such as analyzing photographs to diagnose eye diseases.

They will be better ophthalmologists.

So if we want to do our job better, maybe we should spend our time doing something else, even if the two fields seem completely different, like ophthalmology and art history.

And if we want an example of this, should we use a less intimidating example than Einstein's? OK.

Creator of Jurassic Park and E.R., Michael Crichton.

In the 1970s, he originally trained as a medical doctor, but then went on to write novels and direct the original film Westworld.

But lesser known, he also wrote non-fiction books on art, medicine, and computer programming.

So in 1995, he reaped all of these accomplishments by writing one of the world's most commercially successful books.

and the world's most commercially successful television series.

and the world's most commercially successful film.

In 1996, he did it all over again.

There is a third reason why slow-motion multitasking can help solve problems.

It will help you when you get stuck.

This shouldn't happen in an instant.

Now imagine how you feel when you're working on a crossword puzzle and you can't find the answer. I can't find the answer because the wrong answer is stuck in my head.

It's that simple. just do something else.

Switching topics, switching contexts, forgetting the wrong answers, and giving you the space for the right answers to pop into your head.

But on the slower timescales I'm interested in, getting stuck is a much more serious problem.

You will be denied funding.

The cell culture doesn't grow and the rocket keeps crashing.

Nobody wants you to publish a fantasy novel about a magic school.

Or maybe I just can't find a solution to the problem I'm working on.

And being stuck like that means stagnation, stress, and even depression.

But when you have other exciting and challenging projects to work on, sticking with them is just an opportunity to do something else.

We all get stuck sometimes, even Albert Einstein.

Ten years after the first miraculous year I described, Einstein was putting together the fragments of his greatest achievement, general relativity.

And he was exhausted.

So he turned to simpler problems.

He proposed stimulated emission of radiation.

As you may know, this is the S for Laser.

There he laid a theoretical foundation for laser beams, and while doing so he returned to general relativity and refreshed himself.

He understood what the theory meant: the universe is not static.

It's expanding.

This is such an amazing idea that Einstein couldn't believe it for years.

See, if you get a ball rolling on the laser beam when you get stuck, you're in pretty good shape.

(Laughter) So that's the case with slow-motion multitasking.

And I don't promise it will turn you into an Einstein.

I don't even promise that it will turn you into Michael Crichton.

But it's a powerful way to organize our creative lives.

But there is a problem.

How can we stop all these projects from being completely overwhelmed?

How do you keep all these ideas in your head at all times?

Well, here's a simple solution, a practical solution by the great American choreographer Twyla Tharpe.

Over the past few decades, she's blurred boundaries, mixed genres, won awards, and danced to the music of everyone from Philip Glass to Billy Joel.

She has written three books.

I mean, she's a slow motion multitasker, of course she is.

She says, "You have to be all things.

Why exclude?

you must be everything ”

And Tharp's way of keeping all these different projects from getting too big is simple.

She gives each project a large cardboard box and writes the name of the project on the side of the box.

And in it she throws in DVDs, books, magazine clippings, theatrical programs, physical objects—anything that serves as a source of creative inspiration.

And she writes, "With this box, I don't have to worry about forgetting anything.

One of the biggest fears of any creative person is writing down a great idea and not keeping it in a safe place and then losing it.

Don't worry about that.

Because I know where to find it.

It's all in the box. ”

Many ideas like this can be managed in either physical boxes or digital equivalents.

Therefore, I would like you to incorporate the technology of multitasking in slow motion.

Not because I'm in a hurry, but because I'm not in a hurry at all.

Finally, I would like to give one of my favorite examples.

Charles Darwin.

My slow-burning multitasking abilities are so staggering that I need a diagram to explain it all.

Creativity researchers Howard Gruber and Sarah Davis have analyzed his diaries and notebooks, so we know what Darwin was doing at different times.

So when he left school at the age of 18, he had two initial interests: zoology and geology.

Soon he was registered as an onboard naturalist on the 'Beagle'.

Over the course of five years, the ship ended up stopping in the Galapagos, passing through the Indian Ocean, and circumnavigating the Earth's Southern Ocean.

He began studying coral reefs while aboard the "Beagle".

This was a wonderful synergy between his two interests, zoology and geology, and got him thinking about slow processes.

However, upon returning from the voyage, his interests begin to expand further. psychology, botany. He would spend the rest of his life moving back and forth between these different fields.

He never completely renounces any of them.

In 1837 he began working on two very interesting projects.

One of them is an earthworm.

The other is a small notebook he titled "The Transmutation of Species."

Darwin then started studying economics, my specialty.

He is reading a book by economist Thomas Malthus.

A new moment comes to him.

He instantly understood how species emerged and slowly evolved through the process of survival of the fittest.

He comes up with everything and writes down all the important elements of evolution in that notebook.

But then a new project.

son William is born.

Well, there are natural experiments out there where you can observe the development of human infants.

Darwin immediately begins taking notes.

Of course, I am still working on the theory of evolution and the development of human infants.

But during all this he realized that he didn't really know enough about taxonomy.

So he starts studying it.

Ultimately, he spent eight years becoming one of the world's leading barnacle experts.

Then there is “natural selection”.

This book will be written by him for the rest of his life, but will never be completed.

Twenty years after Darwin laid out all the basics, The Origin of Species was finally published.

and the controversial book The Human Descent.

And a book about human infant development.

It was inspired when I saw my son William crawling across the living room floor in front of me.

William was 37 when the book was published.

And all this time Darwin has been working on earthworms.

He fills his billiard room with earthworms in pots with glass covers.

He shines a light on them to see if they respond.

He holds a hot poker next to them to see if they stay away.

He chews tobacco and -- (blowing) -- blows to see if the worm has a sense of smell.

He sometimes blows the bassoon against earthworms.

I like to think of this great man when I'm tired, stressed, or worried about the reputation of The Descent of Man.

You and I might log in to Facebook or turn on the TV.

Darwin went to the billiard room and relaxed with a keen study of earthworms.

That's why it's fitting that one of his last great writings is "The Formation of Mold on Vegetables by the Action of Insects."

(Laughter) He worked on that book for 44 years.

We are no longer living in the 19th century.

I don't think any of us can sustain a creative or scientific project for 44 years.

But there are lessons to be learned from good players multitasking in slow motion.

From Einstein and Darwin to Michael Crichton and Twyla Tharp.

The modern world seems to give us choices.

Unless we're going to switch quickly from browser window to browser window, we need to live like hermits, excluding everything else and focusing on one thing.

I think it's a false dilemma.

We can multitask and unleash our natural creativity.

All you have to do is slow down.

So...

Create a list of projects.

Please put down your cell phone.

Pick up some cardboard boxes.

And let's get to work.

thank you very much.

(applause)

I tend to assume the worst, and sometimes this habit takes its toll on me.

For example, if you feel an unexpected pain in your body that you've never experienced before and have no specific cause, your mind can suddenly turn tension into heart disease, or calf muscle pain into deep vein thrombosis.

But so far I have never been diagnosed with a fatal or incurable disease.

Sometimes it just hurts for no apparent reason.

But not everyone is as lucky as I am.

Every year, more than 50 million people die worldwide.

Especially in high-income economies like ours, the majority of deaths are caused by slowly progressing diseases: heart disease, chronic lung disease, cancer, Alzheimer's disease and diabetes, just to name a few.

Mankind has now made great strides in diagnosing and treating many of these.

However, we have reached a stage where further health advances cannot be achieved through the development of new therapies alone.

This becomes clear when we look at aspects common to many of these diseases. The odds of successful treatment are highly dependent on when treatment is started.

However, the disease is usually detected only after symptoms develop.

The problem here is that many diseases can actually remain asymptomatic, or undetected, for long periods of time.

Therefore, there is a continuing need for new methods to detect the disease in its early stages, long before symptoms appear.

In medicine, this is called screening.

And screening, as defined by the World Health Organization, is “the putative identification of unrecognized diseases in seemingly healthy people by means of rapidly and easily applied tests.”

The definition is long, so I will repeat it. It is the identification of unrecognized diseases in seemingly healthy people by means of tests that are quick and easy to apply.

And I would like to emphasize the words "quickly" and "easily" because many of the existing screening methods are diametrically opposed.

Anyone who has had a colonoscopy as part of a colorectal cancer screening program knows what I mean.

Clearly, there are various medical tools available to perform screening tests.

This ranges from imaging techniques such as radiography and magnetic resonance imaging to blood and tissue analysis.

We have all taken such tests.

But there is one medium that has long been overlooked. It is an easily accessible, essentially inexhaustible medium that holds great promise for medical analysis.

And that is our breath.

Human respiration is basically composed of five components: nitrogen, oxygen, carbon dioxide, water and argon.

But besides these five, there are hundreds of other ingredients that are present in very small amounts.

These are called Volatile Organic Compounds, and we give off hundreds or even thousands of compounds with each exhalation.

Analysis of these volatile organic compounds in our breath is called breath analysis.

In fact, I think there are many people who have already experienced breath analysis.

Please try to imagine. You are driving home late at night when suddenly a kind policeman appears and gently but firmly asks you to stop and breathe into such a device.

This is an alcohol breath test device used to measure the concentration of ethanol in your breath and determine if driving in that condition is a smart idea.

Well, I think my driving was pretty good, but let me confirm.

(Beep) 0.0, so no worries. fine.

(Laughter) Now, imagine a device like this. The device not only measures the alcohol concentration in your breath, but it also detects diseases like the ones I've described, and potentially many more.

The concept of correlating a person's breath odor with a particular medical condition actually dates back to ancient Greece.

More recently, however, research efforts in breath analysis have surged, and what was once a dream is now becoming a reality.

And let's take this list that we showed you earlier again.

For most of the diseases listed here, there is substantial scientific evidence suggesting that the disease can be detected by breath analysis.

But how exactly does it work?

A key part is the sensor device that detects volatile organic compounds in exhaled breath.

Simply put, when exposed to a breath sample, the sensor outputs a complex signature resulting from the mixture of volatile organic compounds we exhale.

Now, this signature represents a trace of the metabolism, microbiome, and biochemical processes that occur within the body.

When you get sick, your living tissue changes, and the composition of the breath you exhale also changes.

Then all that remains is to associate certain signs with the presence or absence of certain medical conditions.

This technology promises some undeniable benefits.

First, the sensors can be miniaturized and incorporated into small handheld devices like this alcohol breath tester.

This allows the test to be used in a variety of settings and even at home, eliminating the need to visit the doctor's office each time the test is performed.

Second, breath analysis is non-invasive and can be done simply by breathing into an alcohol breathalyzer.

Such simplicity and ease of use will reduce patient burden and motivate widespread adoption of this technology.

And third, the technology is so flexible that the same device could potentially be used to detect a wide range of medical conditions.

Breath analysis can be used to screen for multiple diseases simultaneously.

Each disease now typically requires a different medical tool to perform a screening test.

But this means that you will only find what you are looking for.

With all these capabilities, breath analysis is destined to offer what many traditional screening tests lack.

And most importantly, all these capabilities should ultimately provide a platform for medical analytics that can operate at an attractive low cost per test.

On the contrary, existing medical tools often have a significantly higher cost per test.

Second, the number of tests should be limited to keep costs down. This means that (a) testing can only be performed on a limited portion of the population, e.g. high-risk populations; (b) The number of tests per person should be kept to a minimum.

But wouldn't it actually be beneficial if the test could be run on more people, more frequently, and over a longer period of time on each individual?

The latter in particular will gain access to something invaluable called longitudinal data.

Longitudinal data are datasets that follow the same patient over months or years.

Currently, medical decisions are often based on limited data sets, with only a fraction of a patient's medical history available for decision making.

In such cases, abnormalities are typically detected by comparing the patient's health profile to the average health profile of a reference population.

Long-term data opens up new dimensions, enabling the detection of abnormalities based on the patient's own medical history.

This paves the way for personalized treatment.

Isn't that great?

This will inevitably raise questions like, "If the technology is as great as he says, why aren't we using it today?"

And the only answer I can give you is that everything is not as easy as it seems.

For example, there are technical challenges.

Highly reliable sensors that can detect mixtures of volatile organic compounds with good reproducibility are required.

And another technical challenge is: How can we sample human breath in a very specific way so that the sampling process itself does not alter the analysis?

And we need data.

Breath analysis should be validated in clinical trials and sufficient data should be collected so that individual status can be measured relative to baseline.

Breath analysis will only succeed if a sufficiently large data set is generated and widely available.

If breath analysis lives up to its promise, this is a technology that could truly help transform our healthcare system. Transform healthcare systems from reactive systems, where disease symptoms initiate treatment, to proactive systems, where disease can be detected, diagnosed and treated early, long before symptoms appear.

Now for the last point, but this is the basic point.

What is illness?

Imagine the commercialization of breath analysis as I have described, and early detection becoming routine.

In fact, the remaining problem is one that any screening activity must face. This is because in many diseases it is often impossible to predict with sufficient certainty whether the disease will cause any symptoms or endanger a person's life.

This is called overdiagnosis and leads to a dilemma.

If a disease is identified, you may decide not to treat it, as there is a certain probability that you will not get it.

But how much would it hurt to know that you have a potentially deadly disease?

And don't you really regret finding this disease in the first place?

The second option is to seek treatment early in hopes of a cure.

However, this often comes with side effects.

The bigger problem, to be precise, is overtreatment, not overdiagnosis. Because just because there is a cure doesn't mean that every disease needs to be treated right away.

The increasing adoption of routine screening raises the question of what is called a disease for which treatment can be rationalized, and what is merely an abnormality that should not be of concern.

My hope is that regular screening using breath analysis will provide enough data and insight that, at some point, we will be able to break through this dilemma and predict with sufficient certainty whether and when to treat in the early stages.

The mixture of volatile organic compounds we breathe and exhale contains an enormous amount of information about our physiological state.

What we know today is just scratching the surface.

The power of breath analysis should improve as we collect more data and breath profiles from across the population, including all types of gender, age, origin and lifestyle.

And ultimately, breath analysis should provide a powerful tool not only to proactively detect certain diseases, but also to predict and ultimately prevent them.

And this should motivate even part-time non-hypochondriacs like myself to embrace the opportunities and challenges that breath analysis can offer.

thank you.

(applause)

In 1992, a freighter carrying bath toys was caught in a storm.

A shipping container was swept overboard, and 28,000 rubber ducks and other toys were swept into the North Pacific by waves.

But they didn't stick together.

Quite the opposite. The ducks have since washed up around the world, and researchers have used their tracks to better understand ocean currents.

Ocean currents are caused by many sources, including wind, tides, changes in water density, and the rotation of the Earth.

The topography of the ocean floor and coastline alters these movements, speeding up, slowing down, or changing the direction of ocean currents.

Ocean currents fall into two main categories: surface currents and deep currents.

Surface currents control the movement of the top 10 percent of ocean water, while deep currents move the remaining 90 percent.

Although the causes are different, surface currents and deep currents influence each other in a complex dance, keeping the entire ocean moving.

Near the coast, both wind and tide create surface currents that pull water back and forth as the water level rises and falls.

In the open ocean, on the other hand, the wind is the main force for surface currents.

When the wind blows over the sea, it drags the upper layers of water with it.

That moving water pulls on the layer below, and that layer pulls on the layer below it.

In fact, even water at a depth of 400 meters is affected by surface winds.

If you zoom out to observe surface flow patterns on Earth, you can see that they form large loops called circulations, flowing clockwise in the northern hemisphere and counterclockwise in the southern hemisphere.

That's because the Earth's rotation affects the wind patterns that drive these flows.

If the Earth were not rotating, air and water would simply move back and forth between low pressure at the equator and high pressure at the poles.

But as the Earth rotates, air moving from the equator to the North Pole is deflected eastward, and air returning down is deflected westward.

A mirror image occurs in the Southern Hemisphere, where the main wind currents form loop-like patterns around oceanic basins.

This is called the Coriolis effect.

The wind pushes the sea below into the same rotating vortex.

And because water retains heat more effectively than air, these flows help redistribute warmth across the globe.

Unlike surface currents, deep currents are primarily driven by changes in seawater density.

The water gets colder as it moves towards the North Pole.

Also, the ice crystals that form trap water while leaving salinity behind, resulting in high salinity.

Because of its high density, this cold, salty water sinks and is replaced by warmer surface water, forming a vertical flow called the thermohaline circulation.

Deep-sea thermohaline circulation and wind-driven surface currents combine to form a tortuous loop called the global conveyor belt.

As water moves from the depths of the ocean to the surface, it carries nutrients that nourish the microbes that form the basis of many marine food chains.

The Earth Belt Conveyor is the world's longest meandering stream around the world.

But that movement is only a few centimeters per second.

It can take a thousand years for a drop of water to travel completely.

However, it seems that the speed of the belt conveyor is decreasing due to the rise in seawater temperature.

Models show this will wreak havoc on weather systems on both sides of the Atlantic, but no one knows what will happen if it continues to slow down or stop altogether.

The only way we can correctly predict and prepare accordingly is to continue to study ocean currents and the powerful forces that shape them.

In March 1892, three black grocery store owners were murdered by a mob of white men in Memphis, Tennessee.

Such lynchings occurred throughout the American South, often without subsequent legal investigations or punishment of the killers.

But this time, a young journalist friend of the victim set out to expose the truth about these murders.

Her reporting shocked the nation and launched a career as an investigative journalist, civic leader, and civil rights activist.

Her name was Ida B. Wells.

Ida Bell Wells was born into an enslaved family in Holly Springs, Mississippi on July 16, 1862, a few months before she and her family were emancipated by the Emancipation Proclamation.

After losing her parents and brother to yellow fever at the age of 16, she worked as a schoolteacher in Memphis, Tennessee to support her remaining five siblings.

During this time, she started working as a journalist.

Writing under the pseudonym "Iola", she gained a reputation as an articulate voice against racial injustice by the early 1890s, becoming co-owner and editor of the Free Speech and Headlight newspapers in Memphis.

She had no shortage of materials. In the decades after the Civil War, Southern whites tried to reaffirm their power by committing crimes against blacks, including vote suppression, business destruction, and even murder.

After his friend's murder, Welles launched a Lynch investigation.

She analyzed specific incidents from newspaper reports and police records and interviewed people who lost friends and family to mob lynchings.

She risked her life to get this information.

As a black man investigating a racially motivated murder, she enraged many of her fellow Southern white men involved in the lynching.

Her courage paid off.

Most whites claimed and then reported that lynchings were a reaction to criminal acts committed by blacks.

But usually it wasn't.

Wells has shown through his research that these murders are actually deliberate and brutal tactics to dominate or punish blacks who compete with whites.

Her friends, for example, were lynched when grocery stores became so popular that they diverted business from their white competitors.

Wells published his findings in 1892.

In response, a white mob destroyed her newspaper press.

She was out of town when they attacked, but was threatened to kill her if she returned to Memphis.

So she traveled to New York and republished her work the same year in a pamphlet entitled Southern Horrors: Lynch Law in All Itss.

After settling in Chicago in 1895, she produced a longer work based on Southern horror called Red Record.

Her meticulous recordings of lynching horrors and impassioned street speeches brought her to international attention.

Wells used her newfound fame to spread her message.

She traveled to Europe to rally European anger against racial violence in the American South, hoping that the American government and people would follow their example.

Back in the United States, she did not hesitate to confront powerful organizations, fight the YMCA's racist policies, and lead a delegation to the White House to protest discriminatory practices in the workplace.

She did all this while disenfranchising herself.

Women didn't get the right to vote until Mr. Wells was in his late 50s.

And even then, the vote was largely extended to white women only.

Wells founded the black women's suffrage organization in Chicago and was a key figure in the fight for the right to vote.

But even though she was deeply committed to women's rights, she clashed with the movement's white leaders.

During a march for women's suffrage in Washington, D.C., she ignored organizers' attempts to soften Southern prejudice by leaving black women behind and marched forward alongside white women.

She also clashed with other civil rights leaders who viewed her as a dangerous radical.

Although she insisted on broadcasting in detail the atrocities taking place in the South, some believed that doing so would backfire on negotiations with white politicians.

She helped found the NAACP, but was quickly removed from the organization.

Wells' unwillingness to compromise any aspect of her vision of justice highlighted the weaknesses of various rights movements, ultimately strengthening them, but also making it difficult for her to find a place within them.

She was ahead of her time and fought tirelessly for equality and justice decades before many even imagined it was possible.

Attending TED for the first time is like the last virgin high school student.

(Laughter) You know all the cool people do that.

And while you are outside, you are at home.

You're like the Raspini brothers putting balls in cold water. And -- (laughter) -- I've been playing with my fingers all day. And I am invited.

And you are inside and it's all you wanted.

It's exciting, there's music all the time, and suddenly the music ends. And it only takes 5 minutes.

And you'll want to go back and do it all over again.

But I am so grateful to be here. And thank you to Chris and Deborah Patton for making this possible.

Anyway, today I'm going to talk a little bit about architecture on the subject of creativity and optimism.

And when you combine creativity with optimism, you have two options you can talk about.

We can also talk about creationism. We can also talk about creationism. We can also talk about creationism. I think creationism is unacceptable to this audience, at least from the perspective that you are a proponent of creationism, but we can also talk about optimization. Optimization can be spelled in English with an S instead of a Z.

I think that's what I want to talk about today.

But all sorts of conversations about architecture, really, what you were talking about, what was going on here, the founding of TED, small-scale architecture, etc., but right now, it doesn't really happen without a conversation about this, the World Trade Center, and what's going on there, what it means to us.

Because if architecture is what I believe is the constructed form of our cultural ambitions, what do you do when given the opportunity to fix a situation that represents someone else's cultural ambitions in comparison to ours?

And do we have our own chance to create something new there?

This has been a really lively issue for a long time.

I think the World Trade Center, in a rather disappointing way, focused on architecture in a way that people hadn't thought of in a long time and made it a subject of general conversation.

In my 20-year career of practicing and writing about architecture, I don't remember a time when five people sat me down at a table and asked me very serious questions about zoning, fire extinguishing, safety concerns, whether the carpet would burn, and so on.

These are things we don't talk about very often.

Nevertheless, it is now a constant topic of discussion.

When you can weaponize buildings, suddenly you have to think about architecture in a completely different light.

So now we are trying to think about architecture in a completely different way. Think about it like this:

How many of you have seen USA Today today? There it is. It seems so.

On the cover is the World Trade Center site.

they made a choice.

They chose a project by architecture's formidable kid, Daniel Libeskind.

A prodigy piano player, he started with a squeezebox, moved on to a little more serious problem, a bigger instrument, and now an even bigger one, working his own deconstructivist magic, as you can see here.

He was one of six people invited to participate in the competition after six previous companies criticized it for being so stupid and cliche that even New York City was forced to say, "I'm so sorry, we failed."

right. Is it possible to do this all over again? Except using a few people with vague hints of talent instead of just six perfect people like the city-planning real estate hack I brought last time.

Invite a real architect to make a difference.

So we ended up choosing this or that. Oh please stop clapping.

(Laughter) It's too late. It's gone.

This was a project by a New York-based team called THINK, and there was also the Libeskind Project.

This is going to be the new World Trade Center. There is a huge hole in the ground and a large building will fall into it.

Now, I don't know what you think, but I think this is a pretty stupid decision. Because all you have done is create a permanent monument to destruction by pretending that it will last forever.

But that's what we're trying to do.

But think of these things in terms of the kind of ongoing struggle that American architecture represents, and these two things speak very concretely.

And that is the big difference when we choose an architect, when we try to decide whether we want architecture to be a technocratic solution to everything, or to have a big technical answer that can solve all problems, social, physical, chemical, or something closer to a romantic solution.

It's not meant to be romantic, but it's a great place to take someone out on a date.

Romantic means that there is something bigger and grander than us.

So, in the American tradition, the difference between technocratic and romantic would be the difference in Thomas Jefferson's Cartesian lattice that spreads across the United States. It basically gives the overall shape of all the western states of the United States, but it is a really, really technocratic solution, one that, in Jefferson's time, yields to the rationalist philosophy that is now in vogue.

Or how I would describe it later, "revealing destiny."

Which one would you like to be? Grid or Manifestation of Destiny?

Manifest Destiny.

(Laughter) That's a big deal. It sounds big, it sounds important, it sounds solid. Sounds like America. Bold, serious, and masculine.

And such battles have always been repeated in the architectural world.

I mean, it happens every day in our personal lives too.

Everyone wants to buy an Audi TT, right?

Everyone here must own one. At least you wanted it the moment you saw it.

And so they hopped in their car, turned the tiny electronic key instead of the real one, and hurried home down the new highway, straight to their Tudor castle-like garage.

(laughter) Why? why? why would you want to do that?

why would we all want to do that? I used to own a Tudor one too.

(Laughter) It's our nature to bounce back and forth between this technocratic solution and a larger, kind of more romantic image of where we are.

Let's get straight to the point.

Can I turn off the light for a moment?

I will very briefly describe two architects who architecturally represent the current schism between two traditions of technocrat or technical solutions and romantic solutions.

These are two of the most important architectural practices in the United States today.

One is very young and the other is a little more mature.

This is the work of a company called SHoP, and here you see an isometric view of a large camera obscura that will be installed in a public park.

Do you know camera obscura?

Yes, it's one of those giant camera lenses that takes pictures of the outside world, like a little movie with no moving parts. Project it onto the page and you'll see the outside world as you walk around it.

This is an overview, does it look like a normal building? no.

It is actually non-orthogonal. It's not up and down, square, rectangular, etc., like you'd find in a normal building shape.

The computer revolution, the technocratic technological revolution, has allowed us to abandon normal-shaped buildings, traditional-shaped buildings, and opt for non-orthogonal buildings like this.

It's not the shape that's interesting.

What is interesting is how it is made. How to make.

A whole new way to combine buildings, something called mass customization. No, it's not a contradiction.

What makes a building expensive in the traditional sense is customizing individual parts, which can't be repeated over and over again.

That's why we all live in developer houses.

They all want to save money by building the same thing 500 times.

Because it's cheaper.

Mass customization works by an architect entering a program that tells a computer to manufacture these parts.

Computers then interact with machines, such as computer-operated machines and CAD-CAM machines, and because computers are just machines, they can make a myriad of different changes in an instant.

I don't care. Manufacture of parts.

I don't see any extra cost. It doesn't take extra time.

This is just an electronic lathe, not a worker, so all parts can be cut at the same time.

On the other hand, what an architect can do is, instead of sending someone the giant blueprints you've seen all your life, the construction drawings, you can send them building instructions like the ones you got when you were a kid when you bought a little model with "bolts A to B, C to D."

So what the builder gets is all the individual parts that are custom manufactured off-site and delivered by truck to the builder on site, along with a set of these instruction manuals.

You can easily assemble it just by "attaching bolts from A to B".

Here's a small diagram that explains how it works. And that's what happens in the end.

Below you are looking up at the lens of the camera obscura.

Lest you think this is all fiction, lest you think this is all fantasy or romance, these same architects were commissioned to create something for the central courtyard of PS1, a museum in Brooklyn, New York, as part of the Young Architects Summer Series.

And they said, "It's summer, what are you doing?"

I go to the sea in the summer.

And what do you get when you go to the beach? Sand dunes appear.

Now let's build architectural dunes and beach cabanas.

So they went out and built a computer model of the dunes.

They took pictures and entered the pictures into a computer program. The computer program created the shape of the dunes, and according to their instructions, converted the dune shapes into a series of instructions for the pieces of wood, with minor modifications to standard software.

And those are pieces of wood. That's the instructions.

These are some of them, and here are some of them disassembled.

As you can see, there are about 6 different colors, each representing the type of wood being cut, the wood being cut.

All were delivered flatbed by truck and assembled by hand in 48 hours by a team of 8 people. Only one of them had ever seen a blueprint before.

Only one of them had seen the plan before.

And from the courtyard emerges a landscape of dunes, in which it is completely constructed.

There are only 16 types of wood and 16 types of assembly parts here.

The inside looks like a beautiful piano soundboard.

It has its own built-in swimming pool which is very, very cool.

This is the perfect place for parties. In fact, it was only in business for six weeks.

There was a small changing room and cabanas there and lots of interesting things going on there all summer long.

Now, don't think that this is just a mind light or just a temporary installation. This is the same company that works at the World Trade Center replacing the bridge that was used to cross West Street, a very important pedestrian connection between New York City and the redevelopment of the West Side.

They were asked to design the bridge, replace it in six weeks, and manufacture it with all the parts included.

And they were able to do it. That's their design, using the same computer modeling system and only 5-6 different parts, stanchions like this, some cladding and a very simple frame system, all manufactured off-site and delivered by truck.

they were able to create it.

They were able to create something great.

They are currently building a 16-story building on the New York side using the same technology.

This time we will walk across the bridge at night.

Since it is self-lit, overhead lighting is not required. As a result, neighbors do not complain about the metal halide lighting hitting their face.

We will cross here. And on the other side we get the same magnificence.

Now, if possible, let me briefly show you the opposite.

Hmm, beautiful. This is the reverse side of the coin.

This is the work of David Rockwell from New York City and you can see his work here today.

The current king of Romanticism, who approaches his work in a completely different way.

It's not about creating technical solutions, it's about luring you into things you can do, things that please you, things that make you feel uplifted, things that make you feel like you're in another world. For example, his restaurant "Nobu" in New York should take you from the cluttered streets of New York City to the Japanese rustic and traditional elegance of Japan.

“It should look like seaweed after all,” said the owner.

Or his restaurant, Pod, in Philadelphia, Pennsylvania.

I want you to know that the room you are looking at is pure white.

All surfaces in this restaurant are white.

The reason there are so many colors is because the colors change depending on the lighting.

It's all about sensuality. It's all about transforming.

Look at this -- I didn't touch the button, folks.

This is happening by itself.

Transform with the magic of lighting.

It's all about sensuality. Everything is touch.

At the restaurant Rosa Mexicano, he took us to the shores of Acapulco on the Upper West Side. The walls were crowded with cliff divers.

Let's look at it again.

Now, just to see if you enjoyed it.

And finally, it's about comfort and feeling good where you didn't feel good before.

It's about bringing nature inside.

New York's Guardian Tower has been transformed into W Union Square. Sorry to rush you, but we had to bring in the world's best gardeners to make sure this interior incorporates the garden space of Union Square's courtyard into the building itself.

It's about stimulation.

This is the wine-buying experience simplified by color and taste.

Sparkling, fresh, soft, luscious, juicy, smooth, big and sweet wines are all explained by the colors and textures of the walls.

And finally, it's all about entertainment, and at Cirque du Soleil's headquarters in Orlando, Florida, you're invited to enter the Greek Theater, peer under a tent, and participate in the magical world of Cirque du Soleil.

And I'd probably just leave it as is. thank you very much.

[This talk contains mature content] I have a vagina.

(Laughter) I thought I should know.

It may not come as a surprise to some.

I look like a woman

I think I'm dressed like that.

Actually, I have a ball too.

And it takes a lot of nerve to come here and talk about my genitals.

Just a bit.

But I'm not talking about bravery or bravery.

I literally have the ball.

This is exactly where many of you have your ovaries.

I am neither male nor female.

I am intersex.

Most people think you're either biologically male or female, but it's actually much more complicated than that.

There are many possibilities for someone to be intersex.

In my case, it means I was born with XY chromosomes (probably known as male chromosomes).

And I was born with a vagina and balls inside my body.

I don't respond to testosterone, so my breasts grew during puberty, but I never had acne, hair, or oil.

You may envy it.

(Laughter.) But I actually don't have a uterus, but I was born without a uterus, so I never menstruate, and I can't have a biological child.

We put people in boxes based on their genitalia.

Even before a baby is born, we ask if it's a boy or a girl, as if it actually matters. It's as if you're less excited about having a baby if it doesn't have the genitals you wanted. It's as if what's between someone's legs says something about that person.

Are they kind, generous, funny?

smart?

Who do they want to be when they grow up?

The genitals don't really tell us anything.

But we define ourselves by them.

In this society, we love putting people in boxes and labeling each other.

It gives us a kind of sense of belonging and teaches us how to interact with each other.

But there is one really big problem. That is, biological sex is not black or white.

It's on the spectrum.

In addition to reproductive organs, there are also chromosomes and gonads such as ovaries and testicles.

There are internal genitalia, hormone production, hormone responses, and secondary sexual characteristics such as breast development and body hair.

All of these seven domains of biological sex are highly diverse, but we have only two options to choose from. be male or female.

This is kind of irrational to me. I can't think of any other human trait that has only two options: skin color, hair, height, and eyes.

You can select either Nose A or Nose B. That's it, you have no other choice.

If there are infinite ways to see, think, and act on our bodies, shouldn't there be just as much diversity in our biological sexes?

Did you know that you can have XX and XY chromosomes in addition to XX or XY chromosomes?

Alternatively, you can add X -- XXY.

Or two extra -- XXXY.

Continue from there.

And what does that mean for "normal" people with XX or XY?

I have XY chromosomes.

If my DNA was found at a crime scene, I wouldn't say it would, but I know.

(Laughter) Thousands of years from now, when my skeleton is discovered, I will be labeled as a man.

is it true?

My ball would say yes.

But what about the rest of mine?

And what if a woman has ovarian cancer and has to have her ovaries removed?

Does she still qualify as a woman?

What about other intersex individuals born without balls or ovaries, with one or both, or both?

where are they going?

Do you need a uterus to become a woman?

Many people are born with nothing.

And everyone's favorite part, the genitals. You have one or the other, right?

From the porn videos you've seen, either your 6 inch long penis is just this thick and sticks straight out of your body at a 90 degree angle, or your vagina is this wide inside and your clitoris and labia half an inch above your vaginal opening look exactly what they should be.

you know that

If you've had more than one sexual partner in your life, and you put them one by one, I guarantee you'll be able to identify them by their genitals alone.

(Laughter) Think about it.

continue.

(Laughter) Okay.

There is no screening.

Just be aware.

It's all different, right?

Both sex and gender dichotomy are so ingrained in our society that we never stop thinking about it.

We just automatically put each other in either box, as if it actually mattered.

Until someone makes you question it.

And if you consider me an exception, an anomaly, an outlier, intersex people make up about two percent of the population.

This is the same percentage as genetic redheads.

Their number is about 150 million, more than the entire population of Russia.

Needless to say, we have many.

We are neither new nor unusual.

we are just invisible.

We have existed in every culture throughout history.

And yet we never talk about it.

In fact, many people may not even know they are intersex.

Have you ever had a karyotype to determine your chromosomes?

What about a whole blood panel that checks all your hormone levels?

A friend in his fifties noticed this last year.

Executive Director of interACT, an intersex rights advocacy group here in the United States, she discovered she was intersex at age 41.

Doctors found out when she was 15, but didn't tell her.

They lied that she had cancer. Because it seemed like an easier option than finding out she wasn't the "perfect" woman.

This kind of thing happens all too often when intersex people are lied to or kept secret about our bodies, which comes as a surprise to many.

But we live in a society where we don't talk about sex or bodies at all unless it's to ridicule or shame each other.

I found out I was intersex when I was 10, and for the most part I was fine with that information.

It didn't surprise me much. I was still developing my understanding of the world.

It wasn't until I became an adult that I realized that I couldn't live up to society's expectations, that I didn't belong, that I was abnormal.

And that's when the shame started.

How many times have you seen children play with the "wrong" toy for their gender?

Or try wearing the "wrong" clothes?

Is it always so?

Children have no such ideas about gender norms, no shame about who they should be, what they like, and what they should love.

They have no interest in such things.

They have no shame until we impose it on them.

I was lied to by my doctor too.

When I was 10, I was told I would get cancer if I didn't have my testicles removed.

Then they kept telling me that every year.

To this day, I still have doctors asking me to extract teeth.

But literally no reason.

If a typical XY male like you has one testicle and one is undescended, it is more likely that it will become cancerous. Alternatively, it is even more likely to become cancerous.

They need thermoregulation.

Therefore, it moves away from the body to cool itself down and shrinks back to warm itself.

Mine doesn't need that.

They do not respond to testosterone and do not produce sperm.

I'm fine in my body.

But information about intersex people is so lacking that my doctors never understood the difference.

They didn't understand my body at all.

As I got older, another doctor told me I needed vaginal surgery.

She said that one day I would not be able to have "normal sex" with my husband until I had surgery.

her words.

In the end, I didn't have to have the surgery and I am so grateful.

I'm not here to talk about my sex life.

(laughs) But let's just say it's okay.

(laughs) I'm fine, my body is fine.

In fact, if I didn't tell you, you wouldn't be able to tell the difference between me and others. If I didn't tell you, you wouldn't know I was intersex.

But again, my doctor couldn't tell the difference due to his lack of understanding of the body.

And most of the time my sex life is fine.

The only problem that really comes up is that when it comes to sexual situations, I sometimes recall memories of being touched by doctors over and over again since I was 10 years old.

I was very lucky to escape. I didn't expect to get emotional. I was very lucky to escape physical harm from unnecessary surgery.

However, intersex people cannot escape the psychological damage that comes from living in a society that tries to hide their existence.

Most of my intersex friends have had surgeries like this.

More often than not, they remove testicles like mine, even though my risk of testicular cancer is lower than that of a typical woman with no predisposition or family history of breast cancer.

But we don't tell her to remove her breasts, do we?

It's rare to meet an intersex person who hasn't had surgery.

While these surgeries are often performed to improve the lives of intersex children, they usually backfire and end up causing more harm and complications, both physical and emotional.

I'm not saying doctors are bad or evil.

However, in the society we live in, some doctors will "cure" us who don't fit their definition.

We are not the problem that needs to be solved.

We live in a society that needs to be enlightened.

One way we do this is by creating genderless adolescent guidebooks that help children learn about their bodies as they grow.

Not a girl's body or a boy's body, just a body.

We often have unrealistic expectations of what our bodies are doing outside of our control.

I mean, if one man can grow a rich, gorgeous, hipster beard and another can only grow a few mustaches, what does that mean for who they are as men?

none.

It literally just means that hair follicles respond to testosterone in different ways.

But how many times have I heard a man be embarrassed by something like this?

Imagine a world where we live in a society where our bodies teach us not to be ashamed of what we do or don't do.

I want to change the way we think about biological sex in this society. it asks for a lot.

I guess you could say it's like a ball.

(Laughter) But in the end, we accepted that the world is round, right?

We will no longer diagnose mentally ill homosexuals or hysterical women.

We no longer believe that epilepsy is caused by the devil. That is wonderful.

(Laughter) We are constantly changing, evolving, and understanding more as a society.

And there are many different biological genders.

It's not black or white.

I think that knowledge will not only save intersex children from physical and mental harm, but it will help everyone else.

Has anyone ever felt inadequate or embarrassed because they were not girly enough, too girly, not manly enough, or too manly?

I think we always shame people for being out of line, but really, I think we're shaming people because they don't realize we're out of line.

And the truth is, no one really fits in a box because it doesn't exist.

This dualism, this false masculine and feminine façade, is what we have constructed and what we have constructed for ourselves.

But it doesn't have to exist.

you can disassemble it.

That's what I want to do.

How is it together?

thank you.

(applause)

Architecture is a profession with many rules, some written, some not, some related and some not.

As architects, we are constantly tossing between following these rules according to the book and creating spaces for imagination, experimentation.

This is a difficult balance.

Through architecture in particular, he seeks to challenge preconceived notions, push boundaries and innovate, even if only by exploiting what we always overlook.

This is something I've been working on with my team, Ensamble Studio, since the very early days, taking place in a rigorous historical context such as the city of Santiago de Compostela.

We have built here a cultural building, the General Association of Writers and Editors.

And on top of all the regulations, we had to use stone according to rules, and although our experience was limited, we had incredible references to learn from, some of which came from the city itself, or from nearby landscapes, or other remote locations that influenced our education as architects, and you probably know here.

But somehow, the finished product that the industry offered us as architects to use in our buildings seemed to lose its soul.

So we decided to visit a nearby quarry to better understand the process of turning a pile into perfect square tiles purchased from a supplier.

And we were fascinated by the sheer scale of the material and the action taken to extract it.

And when I looked carefully, I noticed hundreds of irregular blocks piled up everywhere.

These are the leftovers of the extraction sequence, the ugly part that no one wants.

But we wanted them.

we were inspired.

And it was a win-win situation, with a very low cost to obtain this high-quality scrap that was destined for crushing.

Now, we had to convince the client that this was a good idea. But first and foremost, I had to come up with a design process for reusing these randomly shaped rocks, something I had never done before.

Now it would be much easier to go to the quarry with a smartphone equipped with a 3D scanner, document each rock, convert it into a digital model and highly engineer the whole process.

But more than a decade ago, we had to embrace uncertainty, put on our boots, roll up our sleeves and travel to a quarry for a hands-on experience.

Also, we were forced to become contractors because we couldn't find anyone to share the risks with us.

Well, luckily, I convinced the Quarry team to help me build some prototypes to work out some of the technical details.

So we agreed on some mockups, got excited, one stone led to another, and finally managed to build an 18m long, 8m high structure that repurposed all the amorphous material from the quarry. No mortar, no ties, just gravity.

And once built and tested, it was easy to move to the final site in the city center and integrate with the rest of the building. By isolating uncertainty and managing risk in the quarry's controlled environment, we were able to complete the entire building on time and on budget, even using unconventional means and methods.

And it still gives me goosebumps when I see the big chunks of the urban industrial landscape that visitors and neighbors have experienced inside the building.

This building gave us quite a headache, so it was quite possible that it was an exception to our work, but instead began to inform operational practices that would be an opportunity to test the limits of an area that we believe all projects urgently need to be rethought.

Here are four homes we designed, built and live in.

Four manifestos where we use small scales to ask ourselves big questions.

And we are discovering architecture born from the unconventional application of the most mundane materials and techniques, such as various forms of concrete on the upper level and steel and foam on the lower level.

For example, consider these precast concrete beams.

You've probably seen them building bridges, highways, and waterways. We found them when we visited a precast concrete factory.

They may not look particularly homely or beautiful, but we decided to use them to build our first home.

And this was a great moment. Because we were architects and builders as usual, and for the first time we were our own customers.

So here we are trying to find a way to gradually stack huge catalog beams around 20 tons each around the courtyard space...

center of the house.

Due to their dimensions and materials, these large parts are structures that transfer loads to the ground, but they are much more than that.

Those are swimming pools. They are the walls that separate the inside from the outside. They are the windows that frame the scenery. those are the finishes. They are the very spirit of this house.

Home for us is a laboratory testing how standard elements can be used in non-standard ways.

And we find the results interesting.

And we're learning by doing that prefab is so much more than just stacking boxes, heavy parts are airy and transparent.

And in addition to designing and building this home, we receive valuable feedback and share it with family and friends because this is our life and a work in progress.

The lessons we learn here carry over to other projects, other programs, and other scales, inspiring new work.

Again, I'm going to take a very standard product. We expose all the materials hidden in the partition wall, such as galvanized steel studs, insulation foam and cement board that can be easily cut and screwed. And we use them to build very lightweight construction systems that can be built by just about anyone.

We are architects and we do it ourselves in our shop. We're not professional builders, but we want to make sure it's possible.

And it's so nice that Anton can move it by hand and Javier can put it in a container and ship it just like you would ship a package if you move abroad...

That's what we did five years ago.

We have moved our center of gravity from Madrid and our concrete-beamed homes to Brookline.

And we found an ugly duckling who lives in a very nice neighborhood. It was a one-story garage and the only thing we could afford.

But that was fine because we wanted to turn it into a swan, install the parts kit that was just delivered, and be a scientist and a guinea pig again.

So this is a house using the cheapest and most common materials you can find on the market that applies the ubiquitous 4×8 modulation that dominates the construction industry.

However, by changing the configuration of the space and the assembly of parts, an economically built home can be transformed into a luxurious space.

And now we are dreaming and actively working with developers, builders and communities to make this a reality for more homes, more families.

And the world around us can be an endless source of inspiration if we are curious enough to look beneath the surface of things.

Well, I take you to the far side of the moon, to the sublime landscape of Montana. A few years ago, we envisioned the Tippett Rise Arts Center on a 10,000-acre ranch with Kathy and Peter Halstead.

And when we visited the place for the first time, we realized that what we knew about what an art center was was utterly irrelevant to its clients, its community, its landscape.

The white-box museum kind of thing didn't fit here.

So we decided to detonate the center and divide it into a collection of spatial fragments spread over a vast area so that visitors can be drawn into the wilderness of this wonderful place.

So back in the office, we use the land as both support and material, learning from geological processes such as sedimentation, erosion, fragmentation, crystallization and explosion, and thinking through creation to discover architecture that is born from the land and a visceral extension of the landscape, like this bridge over Murphy Canyon.

Or this fountain.

Like this space on the hill...

Or this theater that brings the space and sound of the mountains.

And in order to realize this idea, it is not possible to create a perfect construction plan.

We have to embrace intense weather and local crafts.

Only critical aspects need to be controlled, such as the foam embedded structure, thermal and acoustic properties.

But otherwise, improvisation is both welcome and provocative.

And the moment of construction is still a moment of design, a moment of celebration when different hands, hearts and minds come together for the final dance.

And the results are unpredictable.

It's a surprise.

And we unwrap architecture like we unwrap a birthday present.

Architecture is not discovered, it is discovered.

Extracted from the earth's interior to build shelter for one of the most basic human needs.

Architecture, art, landscape, archeology, geology all come together.

And by using the resources at our disposal in radical ways and creating spaces for experimentation, we can find latent beauty in the raw, imperfect things around us, and shed light on architecture that enhances them and makes them speak their own language.

thank you.

(applause)

The biggest challenge a vampire hunter can take is bringing daylight to a vampire lair.

You sneak down into the darkness of the vampire cave, setting up a series of mirrors as you go.

When the sun reaches a right angle in the sky, a focused beam of light bounces along the mirror, hits the diffuser, and illuminates the great room where the vampires sleep.

You install the last mirror and go through the opening in the corner of the great room.

The diffuser must be mounted on the wall, but the wall is packed with coffins, so you can't dare to disturb it.

The only open places are the other three corners of the room.

Light enters from the southwest corner at a 45 degree angle, reflects off a perfectly smooth metal wall, and hits one of the other three corners.

But which corner will it hit?

You can see that the room is a rectangle that is 49 meters wide and 78 meters long.

Drawing a scale model of the room and tracing the path of light might provide the answer, but the sun will be there in a matter of minutes, so time is running out.

Fortunately, there is another simple and elegant way to solve this puzzle.

So which corner should the diffuser be placed in to let the sun shine into the vampire's lair?

Pause the video if you want to figure it out for yourself.

Answer 2 Answer 1 You can tackle this problem by looking at a small room and you'll find many interesting patterns.

But there is one insight that can solve this mystery almost instantly.

Let's draw the room on the coordinate grid so that the southwest corner is at point (0,0).

Light passes through grid points that have both even or both odd coordinates.

This is true even after reflecting off one or more walls.

Another way of thinking about this is: Light travels at an angle of 45 degrees, so it always crosses the diagonal of the unit square.

Moving 1 meter horizontally changes the x coordinate from even to odd and vice versa.

Moving 1 meter vertically changes the y coordinate from even to odd and vice versa.

As light does here, going diagonally does both at the same time, so the x and y coordinates of the point through which the light passes must be either both even or both odd.

This observation is stronger than you might think.

In particular, it means that there is a way to identify the types of points that light never passes through. If one of the coordinates is even and the other odd, the light will miss them.

This means that the top two corners of the room have one even and one odd coordinate, so they are missing.

Diffuser option is on southeast corner only.

And indeed, when that precious ray of sunshine enters the hall, it bounces between the walls and hits the southeast corner just right.

The vampires who sensed the invasion jumped out of the coffin and turned to dust in the light.

It was a high-stakes test, but you passed it with flying colors.

A talkative grandmother and a roaming bandit face each other on a dirt road.

A Bible salesman lures a one-legged philosopher into a barn.

On an old farm, a traveling handyman teaches a deaf woman her first words.

On a farm in rural Georgia, surrounded by a flock of pet birds, Flannery O'Connor scribbled tales of outcasts, intruders and misfits set in the world she knows best: the American South.

She has published two novels, but is perhaps best known for her short stories that explore small-town life with stinging language, quirky humor, and delightfully off-putting scenarios.

O'Connor draws cartoons in his spare time, and his writings are full of caricatures.

In her stories, the mother has a face "broad and innocent as a cabbage", the men are as active as "floor mops", and one woman's body is shaped like an "urn". Her character names are equally sly.

For example, in the story "The Life You Save May be Your Own," the one-armed castaway Tom Shiflett finds himself lost in the lives of an old lady named Lucinel Crater and her deaf and mute daughter.

Mrs. Crater is confident, but her isolated home is crumbling.

At first, one might doubt Shiftlet's motives for offering house help, but O'Connor soon reveals that the old lady is as scheming as the unexpected guest, challenging the reader's assumptions about who has the upper hand.

For O'Connor, there were no off-limits subjects.

A devout Catholic, she was not afraid to explore the possibility of pious thoughts coexisting with ungodly actions in the same person.

In her novel The Violent Bear it Away, the protagonist grapples with the choice of becoming a man of God, but also commits arson and murder.

The book begins with a reluctant prophet in a particularly compromising position. "Francis Marion Tarwater's uncle had been dead for only half a day, but the boy was too drunk to finish digging the grave." This led passers-by to "draw the body from the breakfast table where it was still sitting, [...] and bury it with enough dirt on top to keep the dogs from digging it up." While her own politics are still being debated, O'Connor's novels may also be attuned to Southern racism.

In "What Stands Up Must Converge" she portrays a son enraged by his mother's prejudices.

However, the story reveals that he too has a blind spot, suggesting that simply recognizing evil does not exempt his character from scrutiny.

O'Connor explores the most unpleasant aspects of humanity, yet opens the rift to leave the door to salvation.

In "It's Hard to Find a Good Man," she saves an intolerable grandmother by forgiving a stubborn criminal while staying close to her family.

While we may cringe at the price women pay for this redemption, the moment we think of it as purely violent or evil, we are forced to face its nuances.

O'Connor's mastery of grotesque and her exploration of Southern closedness and superstition led her to be classified as a Southern Gothic writer.

But her work transcended the purely absurd and terrifying traits associated with the genre to reveal the diversity and nuances of the human character.

She knew that such diversity could be uncomfortable, and that her stories could be acquired tastes, but she was happy to challenge her readers.

O'Connor died at the age of 39 after being confined to a farm in Georgia for most of 12 years because of lupus.

During that time she wrote many of her most imaginative works.

Her ability to move between loathing and revelation continues to draw readers into her endlessly amazing fictional world.

As her character Tom Shiflett puts it, the body is “like a home.

It's been less than 5,000 days since the Internet, the web as we know it, the web we're talking about.

So everything that we have seen so far, for example, starting with satellite images of the entire planet, things that we could never have imagined happened before, and all these things rolled into our lives, right in front of us, just this abundance of things sitting in front of our laptops and desktops.

This kind of endless cornucopia of things is amazing, but it doesn't surprise us.

It's really great to have all this stuff here.

(Laughter) In less than 5,000 days, this much was done.

And if I said 10 years ago that all this would happen, I know you would say it's impossible.

There is simply no economic model in which it is possible.

And if I said it would all come for free, you would say, this is just dreaming.

You are Utopia in California. You are a very optimist.

Still, it's here.

The other thing we do know about this is that 10 years ago, even Wired saw it being talked about and thought this was going to be TV, but better than that.

That was the model. That was what everyone was suggesting would come someday.

And it turned out not so.

First of all, it was impossible and not really.

One of the things I think we're learning is that if you think about Wikipedia, it just wasn't possible.

Theoretically impossible, but practically possible.

Considering all these impossible things, I think one of the things we're learning from this era, this decade, is that we have to get better at believing in the impossible. Because we are not ready for the impossible.

So I'm curious as to what happens in the next 5,000 days.

But if that happened in the last 5,000 days, what will happen in the next 5,000 days?

So I have a kind of simple story. That's what we like to think about is what we're building, what's happened in 5,000 days: all these computers, all handhelds, all cell phones, all laptops, all servers. Essentially, what you get out of all these connections is that you're getting one machine.

Suppose you have only one machine, and you're essentially building one global machine, even though your little handhelds and devices are really just tiny windows to those machines.

So I started thinking about it.

And it turned out to be the most reliable machine we've ever built.

I didn't crash. It's running seamlessly.

And few machines we've ever built can run for as many hours and days.

5,000 days uninterrupted - it's absolutely unbelievable.

And of course the internet isn't just 5,000 days long. The lifespan of the web is only 5,000 days.

So I was basically trying to take measurements.

What are the dimensions of this machine?

And we started by calculating how many billions of clicks are being made on every computer in the world.

And 100 billion clicks per day.

And there are 55 trillion links between all web pages in the world.

So I started thinking more about other types of dimensions and made a quick list. Was photographer Chris Jordan saying the numbers were too big to be meaningful?

Well, here's a list of them. It's hard to tell, but if you count all the chips in every computer on the internet, there are 1 billion PC chips on the internet.

2 million emails are sent per second.

So it's a very big number.

It's just a gigantic machine that consumes 5 percent of all the electricity on the planet.

Present your specifications as if you were creating a spec sheet. 170 trillion transistors, 55 trillion links, email running at 2 megahertz, text messaging at 31 kilohertz, 246 exabytes of storage. It's a big disk.

That's a lot of storage, memory. 9 exabytes of RAM.

And this total traffic runs at 7 terabytes per second.

Brewster said the Library of Congress has about 20 terabytes.

So every second, half the Library of Congress moves around in this machine. It's a big machine.

So I did something else. We found that 100 billion clicks and 55 trillion links per day is roughly the number of synapses in the brain.

1000 trillion transistors is roughly the number of neurons in your brain.

As a first approximation, we get a synaptic firing of 20 petahertz.

Of course, memory is really huge.

But as a first approximation, the size of this machine is like the size of your brain and its complexity.

In fact, that's how your brain works, much like how the web works.

However, the brain does not double every two years.

In other words, if this machine we are building now is about 1 HB, or 1 human brain, then looking at this growth rate, 30 years from now there will be 6 billion HBs.

So by 2040, the total processing power of this machine will exceed the total processing power of humanity in raw bits and so on. And I think this is where Ray Kurzweil and others got this little chart and are trying to cross it.

So what about it? Now, let me explain a few things.

There are three general things I want to say, and three consequences of this.

The first is that basically what this machine is doing is embodied.

We are giving it a body. And that's what we're going to do in the next 5,000 days - we're going to give this machine a body.

The second is to rebuild its architecture.

And third, we will become totally codependent on it.

Now let's talk about these three things.

First of all, we have all this.

We think of them as separate devices, but in reality all the screens in the world are looking at one machine.

These are all basically portals to that one machine.

Second, some people call it the cloud, but it's kind of like touching the cloud.

So, in a way, all you really need is a cloudbook.

And cloudbooks have no storage.

It's wireless. Always connected.

There are many things about it. It's become very simple, basically all you're doing is just touching the machine, touching the cloud, and calculating like that.

So the machine is doing computing.

And in a way, it's kind of a return to the old idea of ​​centralized computing.

But all the cameras, microphones, sensors, etc. in the car are all connected to this machine.

And everything will be done via the web.

And it is already seen, for example, on the phone.

Phones don't go over the web right now, but they're starting to go over the web and will continue to do so.

For example, just to name a few, imagine Google Labs experimenting with Google Docs and Google Sheets, all of which will be web-based.

they are going through the machine.

And what I'm proposing is that every piece will be owned by the web.

Not for now. If your job creates spreadsheets and Word documents, they don't exist on the web, but they do. They will be part of this machine.

They will speak the web language.

They are going to have a conversation with the machine.

In some ways, the web is like a black hole that sucks everything in.

And everything will be part of the web.

In other words, every item or artifact we make has a tiny bit of webness and connectivity embedded in it that becomes part of this machine and our environment becomes the web in the sense of ubiquitous computing. Everything is connected.

Now, for RFID or anything else, it doesn't really matter what technology it is. The point is that everything has some kind of embedded sensor that connects to machines, basically enabling the Internet of Things.

So you can think of shoes as chips with heels and cars as chips with wheels. Fundamentally, most of the cost of manufacturing a car is in the intelligence and electronics built into the car, not the materials.

Many people think of the New Economy as an insubstantial, alternative, virtual existence where the atomic Old Economy exists.

But in reality, the new economy is really a union of the two, embedding information and the digital nature of things into the physical world.

That's what we look forward to. That's what we're aiming for, the fusion of atomic and digital.

And I believe one of the results of that is that there are now different media like TV, movies, videos, etc., and it's basically becoming one media platform.

And although there are many differences in some ways, they will increasingly share common ground with each other.

That is, the fact that copying has no value, the law of the media that the uncopyable, immediacy, authentication, and personalization have value.

Media wants to be fluid.

The reason a thing is free is so that it can be manipulated, not because it is "free" like "beer", but because it is "free" like "free".

And the law of network effects means that the more you have, the more you get.

The First Fax Machine -- The person who bought the first fax machine was an idiot. Because there was no one to send the fax to.

But here she became an evangelist, enlisting others to obtain the fax because it would add value to their purchase.

These are the effects that we will see.

Currency is the focus.

Therefore, these laws will spread to all media.

And another thing about this embodiment is that there is what I call the McLuhan reversal.

McLuhan said, "Machine is an extension of human senses."

And I'm saying, "Humans are going to be, in some ways, an augmented sense of machines."

So we have a trillion eyes, ears and touch through all our digital photos and cameras.

And we see it in programs like Flickr and Photosynth, Microsoft's programs that allow you to assemble tourist views from thousands of tourist snapshots.

In a sense, the machine sees through individual camera pixels.

Now, the second thing I want to talk about is this idea of ​​reconstruction. So what the web is doing is rebuilding.

I have to warn you, but what I'm going to talk about is explaining the term "semantic web" that you've all heard.

First of all, the first stage of the Internet we saw was to link computers.

That's what we called the net. It was the Internet within the Internet.

And we saw that all the computers in the world were there.

If you remember, it was like a green screen with a cursor and there wasn't really much to do and if you wanted to connect, you had to connect from one computer to another.

And all you had to do was, if you wanted to participate in this, you had to share packets of information.

In other words, it continued to transfer. you had no control.

This had to share packets, unlike the telephone system where you could control the lines.

The current second stage is the idea of ​​linking pages.

So in the old version, if you wanted to go to an airline's web page, you had to go from your computer to the FTP site and then to another airline's computer.

Now you have a page. Units resolve to pages, so one page links to another.

If you want to book a flight, go to the airline's flight page, the airline's website, and link to that page.

And since it's a link that we're sharing, we had to be somewhat open to it.

I could not refuse. If someone tried to link to you, you couldn't stop it. I had to get on board with this idea of ​​making my page public so anyone could link to it.

that was what we were doing.

We're now in the third stage that I'm talking about, where we link the data.

So I don't know the name of this thing.

I call it "one machine". But we are linking data.

So you go from machine to machine, page to page, and now data to data.

The difference is that instead of linking from page to page, you actually link from one idea on a page to another idea, not on another page.

So basically all ideas are supported, all items and nouns are supported across the web.

It has been resolved at the item, idea and word level where appropriate.

So in addition to reappearing this idea physically, it's not just a virtual thing, it actually affects things.

So something extends to information about a specific individual, so everyone has a unique identity.

Every person, every item has something very specific and links to a particular representation of that idea or item.

So with this new one, when you link, you're linking to a specific flight, a specific seat.

For example, I live in Pacifica, and right now Pacifica is like a name somewhere on the web.

The web doesn't know that it's actually a town, and that it's the specific town I live in, but that's what we're trying to talk about.

It will be a direct link. The web can read itself and know that it's really a place, and every time it sees the word "Pacifica" it knows that there's actually a place, latitude, longitude, and a certain population.

Here are some common all-three-letter jargon.

All of these are meant to bring this idea of ​​linking to data to life.

Here is an example.

There are 1 billion social sites on the web.

Every time you enter there, you have to tell them again who you and all your friends are.

Why should we do that? Just do it once and you should know who all your friends are.

So that's what you want, your friends are all identified, and you just have to carry these relationships around.

All this data about you should be communicated, and it is enough to do it once.

And we need all networks of all relationships between those data.

That's what we're transitioning to -- where we know these things to some level.

The Semantic Web, Web 3.0, the Big Global Graph -- we're trying to figure out what to call it.

But what they are really doing is sharing data.

Therefore, you should be open to sharing your data. This is a much bigger step than just sharing a web page or computer.

And everything posted here is not just a page, it's a thing.

Everything we have described, every artifact or place has a specific representation and a specific quality that can be directly linked to.

So we have this database.

And there's actually a fourth thing we haven't achieved that we won't see in the next 10 years or 5,000 days. But I think that's what we're trying to achieve. And as the Internet of Things, where I have a direct link to the specific thing in the seat of the plane, that physical thing becomes part of the web.

And we're in the middle of this thing that's fully linked down to all the objects that are in the slightest connection.

The last thing I want to talk about is the idea that we become codependent.

It is always there and the closer it is the better.

Allow Google to see your search history.

When I looked it up, I found that people searched the most at 11:00 in the morning.

So I'm open and transparent about that.

And I believe that full personalization in this new world requires full transparency.

that will be the price.

If you want full personalization, you have to be completely transparent.

Google. I can't remember the phone number, so I'll ask Google.

We've become so dependent on it that now we just google things instead of even trying to remember them. It's easier.

And we object at first by saying, "Oh, that sucks."

But when you consider that we are dependent on this other technology called alphabets and letters, we are totally dependent on it, and that has changed the culture.

We cannot imagine ourselves without alphabets and letters.

And in the same way, we would not be able to imagine ourselves without this other machine being there.

And what's happening in this is some kind of AI, but it's not AI of conscious AI. Larry Page, an expert, told me that's what they're trying to do and that's what they're trying to do.

But when six billion people are Google, who is searching for whom? It goes both ways.

So we are the web, and that's what this is.

We become that machine.

That means the next 5,000 days won't be the web, it'll just get better.

Just like it was for the better, not the TV.

In the next 5,000 days, the web will not just be the web, it will not just be better, it will be something else.

And I think I'll be smarter.

There is intelligence there, but it is also not conscious.

But it's a good way to anticipate what we're doing.

Second, it has become more personalized.

It will know us, which is good.

And again, the price is transparency.

And thirdly, in terms of filling the entire environment, it will become more ubiquitous and we will be in the midst of it.

And all of these devices will be that gateway.

So one idea I would like to share with you is that we should start thinking of this as a new kind of stage in this evolution rather than just "only the web is better".

It looks more global. When you look at this whole thing, you can see that it's a very big machine, a very reliable machine, and more reliable than its parts.

But you can also think of it as a kind of big organism.

So we might react to it as if this were the whole system, rather as if this weren't the big organism we're trying to interact with. It is "one".

And I don't know what to call it other than "The One".

There are better words.

But a kind of unity is beginning to emerge.

Again, I don't want to talk about consciousness, I want to talk about it as if it were a tiny bacterium or Volvox, that organism.

That is, to carry out, to act, to take away. So what I'm saying is that there's only one machine, and the web is that OS.

All screens look into the One. Bits never exist outside the web.

To share is to gain. Let the person read it.

be machine readable.

We want to make something machine readable.

And that one is us. We are in ONE.

Thank you for your time.

(applause)

I was asked to come here and talk about creation.

With only 15 minutes left, it looks like they're already counting.

And I can do that - I think 15 minutes only covers what I call 'creativity', a very administrative area of ​​creation.

Creativity is how we deal with our creations.

Creation can sometimes seem a little elusive or even pointless, but creativity always makes sense.

For example, see this photo.

You know, it was creativity that made that dog appear in that picture, and it was creativity that made you see the chicken in the back.

If you think about it, creativity also has a lot to do with causality.

You know, when I was a teenager, I was a creator.

I just did things.

Then I became an adult, started to know who I was, tried to maintain that persona, and became creative.

It wasn't until I actually published the book and had a retrospective that I could track it down exactly. It seems like all the craziest things I've done, all the drinking, all the partying, but they follow a straight line and actually lead me to the point where I'm talking to you at this very moment.

It's true, but the reason I'm talking to you now is because I was born in Brazil.

If I was born in Monterey, I would probably be in Brazil.

As you know, I was born in Brazil and grew up in the 70's during a period of political hardship. And I was forced to learn to communicate in a very specific way in a place like the semiotic black market.

I couldn't really say what I wanted to say. I had to invent a way to do it.

You didn't put much faith in the information.

That led to the next step in why I am here today. Because I really liked all kinds of media.

I'm a media addict and eventually got involved in advertising.

In fact, my first job in Brazil was to develop a method to improve the readability of signs based on speed, angle of approach and actual blocks of text.

It was a very, very good study and I got a job at an advertising agency.

And they also decided that it was necessary to give me a very ugly Plexiglas trophy.

And another point, why am I here, the day I went to pick up the Plexiglas trophy, the day I rented my first tuxedo and chose it, I had no friends.

On the way home, I had to break up the quarrel.

Someone was hitting another person with brass knuckles.

They wore tuxedos and fought. It was so ugly.

And also -- advertisers do that all the time -- (Laughter) -- and me -- well, what happened was I was on my way back to the car. The beaten man picked up a gun and, for reasons I don't know why he had it, shot the person he initially decided was the attacker.

The first wore a black tie and tuxedo. that's me

Luckily, as you can see, it wasn't fatal.

And even luckily the guy said sorry and I bribed him for compensation or I will sue.

That's how I paid for my ticket to come to the United States in 1983 with this money, and that's exactly why I'm here to talk to you today. Because I was shot. (Laughter) (Applause) Well, when I started working on my work, I decided that I shouldn't do images.

I took this very iconoclastic approach.

Because when I decided to go into advertising, what I wanted to do was airbrush naked people on ice for a whiskey commercial. That's what I really wanted to do. (Laughter) But I, because they wouldn't let me do it, I just, I mean, they just let me do other things.

But I had no interest in selling whiskey. I was obsessed with selling ice.

The first works were actually objects.

It was a combination of finds, product design and advertising.

And I called them relics.

They were first exhibited at the Stax Gallery in 1983.

This is a clown skull.

Remnants of a highly evolved race of entertainers.

They used to live in Brazil. (Laughter) This is an Ashanti joystick.

Unfortunately it was deprecated as it was designed for the Atari platform.

Playstation II is currently in development. I'll probably bring it to the next TED.

A swinging podium. (Laughter) This is a pre-Columbian coffee maker. (Laughter) The idea actually came out of an argument at Starbucks when I claimed I didn't drink Colombian coffee. This coffee was actually pre-Columbian.

bonsai table.

The entire Encyclopædia Britannica in one volume for travel.

And half gravestones for those who are not yet dead.

I wanted to bring that into the realm of video, so I decided to make something that had a conflict of identity.

So I decided to work with the cloud.

Because clouds can mean anything you want.

But now I wanted to make the piece in a very low-tech way, so I wanted to make something that meant simultaneously a wad of cotton, a cloud, and Dürer's praying hand. Although this is a lot like Mickey Mouse's praying hands.

But I was still still, you know, this is a kitten cloud.

They are called "equivalents" after the work of Alfred Stieglitz.

"snails"

But I was still working on sculpting and trying to get more and more flat.

"teapot"

It was 94, I think, and I had the opportunity to go to Florence, where I saw Ghiberti's "The Doors to Paradise."

And he did something very tricky.

He brought together two different media from different eras.

First, he learned the old-fashioned way of making reliefs and created them using the then-current technology of three-point perspective.

And it's completely overkill.

And your eyes don't know what level to read.

And you get caught up in this kind of representation.

So I decided to create these very simple renders. It was first taken as line art, very complicated, but then rendered with wire.

The idea was to make it look like a pencil drawing, because white is something everyone overlooks.

And they looked at it and said, "Oh, this is a pencil drawing."

And this double interpretation shows that it really existed over time.

It has a physicality and goes deeper and deeper into a kind of narrative towards the image. This is "Monkey with Laika".

"relax"

"Fiat Lux".

And in the same way, the history of expression has also evolved from line drawing to shadow painting.

And I wanted to work on other themes as well.

I started working it into the landscape realm. A landscape is like a painting of almost nothing.

I made these paintings called "Yarn Paintings" and named them after the amount of yardage I used to render each painting.

These always end up as photographs, but in this case they are more like etchings.

So this is a lighthouse.

This is "6,500 yards" after Corot. "9,000 yards" named after Gerhard Richter.

I don't know how many yards after John Constable.

I decided to move away from the line and work on the idea of ​​points that are more like the kind of expression we find in photography itself.

I met a group of kids on the Caribbean island of St Christopher to work and play with.

I got some photos from them.

When I arrived in New York, I decided they were the children of sugar plantation workers.

Then I made a portrait of them by manipulating sugar on black paper.

These are -- (applause) -- thank you. This is "Fastest Valentina".

It was just a child's name and a little bit of information about someone I met very briefly.

"Varicia"

"Jacinza"

But yet another layer of representation was introduced.

As I was doing this while making these photos, I realized that I could add another thing that was going to be the subject: something that interferes with the theme. So chocolate is very good. Chocolate conjures up ideas ranging from scatology to romance.

So I decided to make these pictures and they were so big I had to walk away from them to see them.

That's why they are called "chocolate paintings".

Freud can probably explain chocolate better than I can. He was the first test subject.

And Jackson Pollock too.

Crowd photos are especially interesting. because you're going there Because it tries to find thresholds where something very easy to define, like a face, becomes just a texture.

"Paparazzi."

Part of the collection was rendered using dust from the Whitney Museum of American Art.

And I chose minimalist works with an emphasis on concreteness.

And then render this with the most non-specific material: dust itself.

As you know, it contains particles from the skin of every museum visitor.

They will DNA scan this and make a great mailing list.

Richard Serra.

I bought a computer and was told it had millions of colors.

The artist's first reaction to this is, who counted? Look?

And I realized that I had never worked with color, because monochromatic ideas were hard to control.

But applying them to numerical structures is more comfortable.

So the first time I worked with color was when I created a mosaic from Pantone swatches.

The end result is a very large photo, so I shot it with a very large camera, an 8x10 camera.

So you can see the face of every swatch like this photo from Chuck Close.

And you have to walk quite far to see it.

Also, references to Gerhard Richter's use of color charts, and the ideas there, find their way into another realm of expression that is very common to us today: bitmaps.

In the end, I narrowed down the subject to Monet's "Haystack".

This is something I used to do as a joke, to make the same thing as Robert Smithson's "Spiral Pier" and leave a mark as if I had done it on the table.

I tried to prove he didn't do that in Salt Lake.

But then, as I was building the model, I was trying to explore the relationship between the model and the original.

And I felt that I needed to actually go and build an earthworks myself.

I choose a very simple lineart. It looks kind of silly.

And at the same time I was doing these very large constructions 150 meters away.

Now I make very small things, but I show them together, under the same light, so the viewer really needs to understand what they are looking at.

I wasn't interested in big things or small things.

I was more interested in what was in between. Because there is a huge amount of room for ambiguity.

This, as you can see, is the size of the person there.

This is a pipe.

Hanger.

And this is another thing I've done - I know you work, but everyone loves to see someone paint, but not many people have the chance to see someone paint - there are many people at the same time to prove one painting.

i love this piece. I spent two months drawing cartoon clouds over Manhattan.

And it was so great. Because I was interested in theater. I've been interested in it since the early days, and it's natural.

In a play, characters and actors are in the same place and try to negotiate with each other in front of the audience.

Some of these look like clouds and some are clouds at the same time.

So they're like perfect actors.

My interest in acting, especially bad acting, has served me well.

In fact, I once paid about $60 to see a very great actor perform a version of "King Lear," and by the time that actor started becoming King Lear, I felt really robbed because he was no longer the great actor I had paid to see.

On the other hand, I paid maybe $3 and went to a warehouse in Queens to see an amateur group's version of "Othello."

And it was very fascinating, because you know the guy -- his name was Joey Grimaldi -- he pretended to be a Moorish general -- you know, for the first three minutes he really was that general, but then he went back to being a plumber and working as a plumber -- plumber, general, plumber, general -- so for three dollars, I got to see two tragedies in one.

See, it's not a matter of impression, I think it's just as important as giving people the illusion of real perfection. I usually work at the lowest threshold of visual illusion.

Because this isn't about deceiving anyone, it's actually giving someone a measure of their beliefs. That is, how much you want to be deceived.

That's why we pay to go to magic shows and such.

Well, I think that's it.

My time is nearing its end.

thank you very much.

I got my first computer as a teenager growing up in Accra and it was a really cool device.

You can also use it to play games. It can also be programmed in BASIC.

And I was fascinated.

So I went to the library to figure out how this works.

I've read about how the CPU is constantly shuffling data between memory, RAM, and the ALU, the arithmetic logic unit.

And I wondered if this CPU really needed to run insane just to keep all this data moving around the system.

But no one really cared about this.

When computers were first introduced, they were said to be a million times faster than neurons.

People were really excited. They thought they would soon exceed the capacity of their brains.

These are the words of Alan Turing. “In 30 years it will be as easy to ask a computer questions as it is to ask a human.”

This was in 1946. And in 2007, it's still not true.

So the question is, why aren't these kinds of powers actually manifesting in computers as we see them in our brains?

What people didn't realize, and I'm starting to realize now, is that we're paying a huge price for the speed they claim to be the big advantage of these computers.

Let's look at some numbers.

This is the world's fastest computer, the Blue Gene.

It has 120,000 processors. Basically, it can process 10,000 trillion bits of information per second.

It's from 10 to 16. And it consumes 1.5 megawatts of power.

Adding that to Tanzania's production capacity would be really nice.

It would really revitalize the economy.

Coming back to America, the amount of power this computer uses is equivalent to 1,200 American households.

That's how much power this computer uses.

Now let's compare this to the brain.

This is actually a picture of Rory Sayles' girlfriend's brain.

Rory is a graduate student at Stanford University.

He uses MRIs to study the brain and claims it's the most beautiful brain he's ever scanned.

(Laughter) That's what real love is right there.

So how much does the brain do?

I estimate 10-16 bits/sec, which is actually pretty much what Blue Gene does.

That's the question. The question is how much processing, similar amount of data are you doing. The question is how much energy or electricity the brain uses.

And it's actually about the same as a laptop computer, only 10 watts.

In other words, the brain is doing with the energy a laptop consumes what we do today with a computer with the energy consuming 1,200 homes.

So the question is, how can the brain achieve such efficiency?

And let me summarize. The bottom line is that the brain is processing information with 100,000 times less energy than current computer technology.

How can the brain do this?

Let's take a little look at how the brain works, and then compare it to how a computer works.

So this clip is from the PBS series "The Secret Life of the Brain".

Cells that process information are shown.

they are called neurons.

They send tiny electrical pulses to each other through the process, and when they come in contact with each other, those tiny electrical pulses can jump from one neuron to another.

That process is called a synapse.

There is a huge network of cells interacting with each other, with about 100 million cells transmitting about 10 quintillion pulses per second.

And that's basically what's going on in your brain right now watching this.

How does that compare to how computers work?

In a computer all data goes through the central processing unit and basically any data has to go through the bottleneck. In the brain, on the other hand, there are neurons and data really just flows through a network of connections between them. There are no bottlenecks here.

This is a network in the literal sense of the word.

The net works in the brain.

Just by looking at these two pictures, those words come to mind.

This is serial and rigorous. It's like a car on a highway, everything has to be done in lockstep. On the other hand, this is parallel and fluid.

Information processing is highly dynamic and adaptive.

So I'm not the first to figure this out. These are the words of Brian Eno. "The problem with computers is that there isn't enough Africa in them."

(Laughter) Brian actually said this in 1995.

No one was listening then, but now people are starting to listen. Because there are pressing technical issues that we face.

I'll talk a little bit about that in the next few slides.

This is actually an amazing convergence between the devices we use in our computers to compute and the devices our brains use to compute.

The devices that computers use are so-called transistors.

This electrode, here called the gate, controls the flow of current from the source to the drain (those two electrodes).

And that current, current, is carried by electrons, just like in a house, etc.

When the gate is actually turned on, the amount of current increases and a steady current flows.

And when the gate is turned off, no current flows through the device.

The computer uses the presence of this current to represent 1 and the absence of current to represent 0.

Now, what's happening is that as transistors get smaller and smaller, they no longer behave that way.

In fact, they're starting to act like devices called ion channels that neurons use for computation.

This is a small protein molecule.

So there are thousands of these in a neuron.

And it's in the cell membrane, where it has pores.

And these are individual potassium ions flowing through its pores.

Well, this pore can be open or closed.

But when open, these ions must flow in alignment one at a time, creating a kind of sporadic current rather than a steady one. This is a sporadic current flow.

And even when the pores are closed, neurons can open and close these pores to generate electrical activity, but even when the pores are closed, these ions are so small that they can actually penetrate, and several ions can enter at once.

This means that if the pores are open, an electric current will flow from time to time.

These are yours, but with some zeros thrown in.

And when it is closed it shows zero but throws some values.

Now this is starting to happen with transistors as well.

The reason this is happening is that in the technology we are using now, in 2007, transistors are large enough to allow multiple electrons to flow sideways through the channel at the same time.

In fact, all about 12 electrons can flow this way.

This means that the transistor serves approximately 12 ion channels in parallel.

Now, a few years from now, by 2015, transistors will shrink significantly.

This is what Intel does to keep adding cores on its chips.

Alternatively, you can store 1 Gigabyte of data on your current memory stick. It used to be 256 bytes.

Transistors have been miniaturized to enable this, and technology has really benefited from that.

But what's happening now is that in 2015 the transistor will be so small that only one electron will flow through its channel at a time, the equivalent of one ion channel.

And then the same kind of congestion that occurs with ion channels begins to occur.

The current turns on and off randomly even when it should be on.

That means the 1's and 0's on your computer get mixed up and your machine crashes.

Therefore, we are still in the unknown stage of how to compute on this kind of device.

And the only thing this kind of device can compute is the brain.

The computer selects a particular data item from memory, sends it to the processor or ALU, and writes the result back to memory.

That's the red path highlighted.

As for how the brain works, I told you guys, you have all these neurons.

And the way information is represented is by dividing the data into smaller pieces represented by pulses and different neurons.

All this data is therefore distributed throughout the network.

And the way to process that data and get results is to transform this activity pattern into a new activity pattern as the data just flows through the network.

Therefore, set up these connections so that the input pattern flows unaltered to produce the output pattern.

What we can see here is that there are redundant connections.

So if any part of this data or part of this data is destroyed, it will not be shown here. These two parts can use redundant connections to activate the missing part.

So even if you go to a crappy device that sometimes wants a 1 but sees a 0 and doesn't see it, the network has redundancy and can actually restore the missing information.

It makes the brain inherently tougher.

What we have here is a system that stores data locally.

And fragile because each of these steps must be perfect. otherwise you will lose your data. The brain, on the other hand, has a system that stores data in a distributed way, and it's robust.

Basically, I want to talk about my dream of building a computer that works like a brain.

This is what we have been working on for the last few years.

We then present a system we designed to model the retina, the part of the brain that lines the eyeball.

I didn't do this by actually writing code like I would do on a computer.

In fact, the processing that takes place in that little brain is very similar to what a computer does when streaming video over the Internet.

They want to compress information -- they just want to send changes in images, new information, etc. -- and in doing so the eyeballs can squeeze all the information down to the optic nerve and send it to the rest of the brain.

Instead of doing this in software or running that kind of algorithm, we went and talked to a neurobiologist who actually reverse engineered a part of the brain called the retina.

And they figured out all the different cells, figured out the network. And we took that network and used it as a blueprint for designing silicon chips.

Neurons are therefore represented by small nodes or circuits on the chip, and connections between neurons are actually modeled and represented by transistors.

And these transistors work basically the same way ion channels work in the brain.

This gives you the same kind of robust architecture I described.

The actual prosthetic eye looks like this.

Our designed Retina chip is behind this lens.

And the chip -- here's a video of the silicon retina output from the output while observing Kareem Zagurul, the student who designed this chip.

Let me explain what you see. It's not as simple as a camera because it emits different kinds of information.

The Retina Chip extracts four types of information.

Areas of dark contrast are extracted and appear as red on the video.

Also, white or bright contrast areas are extracted and appear as green on the video.

This is Kareem's black eye with the white background seen here.

It also extracts motion.

When Kareem moves his head to the right, he sees this blue activity there. This represents areas of increased contrast in the image, ie areas that change from dark to light.

You will also see this yellow activity. This represents areas of reduced contrast. It goes from light to dark.

And these four types of information -- the optic nerve has about 1 million fibers, 900,000 of which transmit these four types of information.

So we're really duplicating the kind of signal that's on the optic nerve.

What you notice here is that the snapshot taken from the output of the Retina chip is very sparse, right?

Instead of the background glowing green everywhere, only the edges glow green, then the hair glows green, and so on.

This is the same thing you see when compressing and transmitting video. Since the files are small, we want the video to be very sparse. That's what the retina is doing, it's doing it with circuits alone, capturing on a chip how the network of interacting neurons there is doing.

But what I mean is, I'll show you here.

This image looks something like this, but here we show that the image can be reconstructed. That is, you will almost be able to recognize Kareem at the top.

Well then, please.

Yes that's the idea.

If you stand still, you can only see the contrast between light and dark.

But when moving back and forth, the retina senses the change.

That's why when you're sitting here and something happens in the background, you just turn your eyes to it.

There are cells that sense change and direct your attention there.

So these are very important to catch someone trying to sneak up on you.

Finally, I would like to say that this is what happens when you apply Africa to the piano.

This is a modified steel drum, and this is what happens when you put Africa in the piano.

What I want to do is put Africa inside a computer and come up with a new kind of computer that produces thoughts, imagination, creativity and so on.

thank you.

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

Do you have a mental picture of the work you are doing, the future of Africa, and this conference? If so, what connections can you make between them?

Kwabena Boaen: Yes, as I said at the beginning, I got my first computer when I was a teenager growing up in Accra.

And my gut reaction was that this was the wrong way to go.

It was very pushy. It wasn't very elegant.

If I had read sci-fi like this, grew up hearing RD2D2 and what it was called, and just accepted the hype about computers, I don't think I would have reacted that way.

I was approaching this issue from another perspective and bringing that perspective to the problem.

I think a lot of people in Africa have this different perspective, and I think it affects technology.

And that will affect how it evolves.

And you come from a different perspective, so I think you'll be able to see that infusion and come up with new things.

I think we can contribute. We can dream like everyone else.

CA: Thank you Kwabena, it was really interesting.

thank you.

(applause)

Applying for jobs online is one of the worst digital experiences of our time.

And it's not like it's actually better to apply for a job in person.

[How we work] As we know, employment is broken in many ways.

It's a terrifying experience for people.

About 75% of people who applied for jobs in various ways in the past year said they hadn't heard anything from their employers.

And at the corporate level it's not so good.

46% of people are laid off or quit within a year of starting work.

It's pretty shocking.

It also negatively affects the economy.

For the first time in history, there are more open jobs than there are unemployed, and this screams a problem for me.

At the heart of all this, I believe, is one piece of paper: a resume.

A resume certainly contains useful information, such as what role the person has held in the past, their computer skills, what languages ​​they speak, etc. But what the resume lacks is latent potential that the person may never have had the chance to do.

And in an economy that's changing so rapidly, jobs may emerge online that require skills that no one else has, but you won't be able to match people for future jobs if you just look at what someone has done in the past.

I think technology can really help here.

You've probably seen algorithms get pretty good at matching people and things. But what if that same technology could actually help us find the right job?

But I know what you're thinking.

Algorithms for choosing your next job sound a bit intimidating, but one has been proven to be really predictive of a person's future success at a job, and it's called the multi-measure test.

Multi-measure testing isn't really new, but it used to be very expensive and required a PhD sitting across from you answering lots of questions and writing reports.

A multi-measure test is a way to understand a person's unique traits: memory and attention.

What if you could conduct multiple measurement tests, make it scalable and accessible, and provide employers with data on the actual characteristics of people who are suitable for the job?

All this sounds abstract.

Let's try one of the games together.

A blinking circle appears. Your task is to clap if the circle is red and do nothing if it is green.

[Are you ready?] [Start!] [Green circle] [Green circle] [Red circle] [Green circle] [Red circle] Maybe you're the type to clap a millisecond after the red circle appears.

Or maybe you're the type that takes a while to get 100% sure.

Or maybe you clap on the green when you shouldn't.

The great thing here is that this isn't like a standardized test that says some people are employable and some people aren't.

Instead, it's important to understand your characteristics and their compatibility with the factors that make you suitable for a particular job.

We found that if you clap late on red and not clap on green at all, you may be more alert and more self-controlled.

People in this quadrant tend to be good students, good test takers, and good at project management and accounting.

But if you clap red quickly and clap green occasionally, it could mean you're more impulsive and creative, and I've found that top-performing salespeople often embody these traits.

The way we actually use this in recruiting is by having the top performers in the role take neuroscience exercises like this.

Next, develop an algorithm that understands the characteristics of top performers.

And when people apply for the job, we can surface the candidates who may be the best fit for the job.

So you might think this is dangerous.

The world of work today is not so diverse. If you're building an algorithm based on current top performers, how do you know you're not just perpetuating biases that already exist?

For example, if you build your algorithm on top performing CEOs and use the S&P 500 as your training set, you'll find that you're actually more likely to hire a white man named John than any woman.

And that is the reality of who is currently in that role.

But technology actually presents some very interesting opportunities.

We will be able to create algorithms that are fairer and more impartial than humankind has ever experienced.

All algorithms we put into production are pre-tested to not prioritize gender or ethnicity.

And if you have an over-favored population, you can actually change the algorithm until it no longer applies.

Racism, classism, sexism, ageism, and even good schoolism can be overcome by focusing on the unique traits that make a person right for the job.

Our best technology and algorithms shouldn't just be used to find your next movie or your new favorite Justin Bieber song.

Imagine if we could harness the power of technology to give us real guidance on what to do based on who we are on a deeper level.

From Shakespeare's plays to modern television dramas, the unscrupulous conspirators, whose ends always justify the means, have become a familiar character type we loathe.

So familiar, in fact, that for centuries we've had a single word for such a character: "Machiavelli."

But is it possible that we've been using the term incorrectly all along?

Early 16th-century politician Niccolo Machiavelli wrote many works on history, philosophy and theatre.

However, his notoriety persists due to his short political essays, known as "The Prince," which were structured as advice to current and future monarchs.

Machiavelli was not the first to do this. In fact, the tradition of the work known as the "mirror for the prince" dates back to antiquity.

But unlike his predecessors, Machiavelli did not attempt to describe an ideal government or encourage his audience to govern justly and virtuously.

Instead, he focused on the issue of power: how to obtain it and how to keep it.

And in the decades after its publication, "Prince" has acquired a diabolical reputation.

During the European Wars of Religion, both Catholics and Protestants accused Machiavelli of inciting violence and oppression by his opponents.

By the end of the century, Shakespeare was using "Machiavellian" to refer to an amoral opportunist, which in turn led to the popular use of "Machiavellian" as a synonym for manipulative villain.

At first glance, The Prince's reputation as an oppressive manual seems well-deserved.

Throughout, Machiavelli seems utterly indifferent to morality, except whether it is helpful or detrimental to maintaining power.

For example, princes are told to consider all the atrocities necessary to seize power and carry them out in one fell swoop to ensure future stability.

Neighborhood attacks and crackdowns on religious minorities have been cited as effective methods of occupying the public.

In regard to the personal conduct of a monarch, Machiavelli advises him to continue to uphold virtues such as honesty and generosity, but be ready to abandon them as soon as his own interests are threatened.

Most famously, he said, "It is far safer to be feared than to be loved" for a ruler. The pamphlet ends with an appeal to Lorenzo de' Medici, recently appointed ruler of Florence, to unite the divided Italian city-states under his rule.

Many justify Machiavelli as being motivated by anti-sentimental realism and a desire for peace in an Italy torn apart by internal and external conflicts.

According to this view, Machiavelli was the first to understand the hard truth. In other words, the greater good of political stability is worth whatever unpleasant tactics are needed to achieve it.

The philosopher Isaiah Berlin suggested that rather than being immoral, the prince listened to ancient Greek morality, prioritizing national glory over the Christian ideal of personal salvation.

But what we know about Machiavelli may not fit this image.

The author spent 14 years as a diplomat in his native Florence, staunchly defending a republican government elected by would-be monarchs.

When the Medici seized power, they not only lost their positions, but were even tortured and exiled.

With this in mind, we can read the pamphlet he wrote from exile not as an advocacy of a monarch's rule, but as a scathing account of how that rule was conducted.

In fact, Illuminati like Spinoza saw it as a warning to free citizens that they could be conquered in various ways by ambitious rulers.

In fact, both readings could be true.

Machiavelli may have written a manual for oppressive rulers, but in sharing it he also revealed the cards to those ruled.

In doing so, he revolutionized political philosophy and laid the foundation for Hobbes and future thinkers to study human problems based on concrete realities rather than preconceived ideals.

Through brutal and shocking honesty, Machiavelli sought to shatter common delusions about what power really is.

And in a letter he wrote to a friend shortly before his death, he hoped people would "learn the way to hell to escape from it."

(Beatboxing) Hey, what's up?

My name is Tom Tam. I am very happy to be back at TEDx.

When I first hit the stage in Sydney in 2013 as a bright-eyed boy from Brisbane, I had no idea that I would be giving the most-watched TEDx presentation of all time.

(Laughter) (Applause) But you know, it was totally unexpected, so I was very excited.

But today, five years from now, I am very confident that I am standing before you as a slightly puffed-up, time-lapsed version of myself.

(Laughter) I'm confident that I'm about to deliver the most instantaneous switch-off, vomiting-inducing story ever.

What I am about to show you, which you may find difficult to see, is all done in the name of science.

First, for those unfamiliar with what I do, you could call me a beatboxer if you really wanted to.

(Beatboxing) Like, for example…

Here's a sample: (beatbox) (rhythm changes) (humming) (applause and cheers) Thank you.

(Applause.) And being a beatboxer means that I, professionally, rely 100 percent on the flexibility of the unfiltered human voice.

And for years, people my age were like, 'Oh my god, that's so cool.

When did you think you could do it? ”

After thousands of hours of practice -- (laughter) "So what's your real job?"

"I am a full-time beatboxer, sir."

But there's one question I get all the time, and it's a little bit harder to answer. How do you do that? How do you make that noise?

I mean, I know that muscle memory determines the position of my (beatboxing) lips, but I have no idea about the inner workings of it all.

You know, all the flapping pieces and sort of hanging things and how they interact - (laughter) in any way I can - (beatboxing) metaphorically speaking, I know how to drive, but I don't know what's under the hood.

So I decided to go through 5,000 strangers in captivity, a few nasty cameras, everyone watching online and their browser histories, and invite them to places where even the most intimate encounters had never happened...

my throat.

And to help with that, we would like to introduce a very professional guest from the Queensland Voice Centre, on stage. He is the man who has been in my mouth more times than I would like to admit, Matthew Broadhurst, larynx legend, otolaryngologist and laryngeal surgeon.

(applause and cheers) MB: Thank you, Tom, thank you.

And good evening everyone.

It's an honor to be on stage at TEDx tonight.

(laughs) Hmmm.

(laughter) TT: He's not warming his hands.

It's not going to be that intimate.

MB: Some time ago we started trying to dive deep into this extraordinary world of beatboxers and try to understand how such a vast array of sounds is possible for humans.

And what we found, and by the way these are mouthwatering things, what we found was absolutely amazing.

Even after two years of laryngeal surgery under the world-famous Professor Steven Seitels at Harvard Medical School, I have never seen surgery so amazing and fascinating. That's what I'm going to show you tonight.

(laughter) Now, for those of you who are a little skeptical, the next 10 minutes or so get progressively more raw and stomach-churning, so let's get down to business -- TT: Feel free to use the bucket.

(Laughter) MB: So when we make a sound, we use our vocal cords to take air from our lungs and turn it into a vibrating column of air in our throat.

In a trumpet analogy, the mouthpiece is the vocal cords and the horn section is the throat.

If we removed your head and dropped the neck a bit, leaving only the vocal cords in a vibrating torso, you would sound like this.

(flat tone) TT: (high tone) MB: Communication is quite difficult, but luckily we have throats.

We have all the soft tissue and it really provides all the amazing dynamics of the sound that you will hear tonight.

Well, this is a rigid laryngoscope.

TT: Hmm, spicy boy.

(laughs) MB: I know, I know.

(Laughter) At 10 millimeters in diameter, it gives us the highest resolution image of the larynx available.

Here we use a stroboscope and a trigger mic.

A microphone picks up frequencies so I can explain how this works.

So can I turn the lights down?

TT: (bass) MB: Turn on the lights here.

TT: (Treble and Bass) MB: Sound frequency matched to stroboscope.

That is the light that flickers in the cup.

TT: (bass) MB: It's around 80 hertz.

So what we can do is take advantage of it to shift the strobe phase and sound out of sync.

This allows real-time slow-motion capture of vibrating tissue activity.

Applying this to the larynx gives a smooth slow motion of the vibrating vocal cords.

So that's what we're working on.

yes, are you ready?

TT: Yes.

(laughs) MB: Yes, let's go.

Let's take a look at the voicebox.

(Laughter) It's very hard not to gag this.

say yes

TT: (singing) E -- MB: So you can see vocal cords, little string-like structures down there.

(Laughter) And if you look at the skin on the neck, you can see how much light penetrates the skin.

Ok, can I turn the lights back on?

(Laughter.) (Applause.) Now say a nice "e."

TT: (singing) E.

(laughter) TT: (singing) E.

(audience gasps) MB: That's the vibration of the vocal cords. about 120 hertz.

In order to make this sound, it collided 120 times in one second.

And we also find that they are perfectly normal.

I mean, all his beatboxes, all those sounds, they've been doing it Tom's way for years, and it's never been damaged.

It's really amazing.

wonderful.

OK。

TT: (sheep) Here it is.

MB: Now watch the vocal cords change from high to low.

You will see a long and skinny body type going to a short and fat body type.

Really think "yes".

TT: (high to low) E.

MB: Yes.

TT: (high to low) E.

MB: And what you see is that his vocal range is very extreme, far more extreme than any other performer I've worked with. The machine can't really catch a really high pitch.

TT: (treble) MB: So you know the range of the whistle is about 2,092 hertz.

That means the vocal cords are banging against each other well over 2,000 times per second to produce that sound.

That's really unusual.

Come to think of it, it's only 15 millimeters long, so barely the width of your thumb.

It's unbelievable -- (Laughter) It's amazing that this organ can do that.

Therefore, we will replace it with a flexible laryngoscope.

This is a little more graphic.

TT: I bought it at SEXPO.

(laughs) MB: It wasn't in the script.

(Laughter) (Applause) TT: Used.

(laughter) MB: Well, I had to time this perfectly because I needed local anesthesia.

I have to numb my nose and put the camera in.

It doesn't help you generate a lot of sounds, but it gives you a very cool idea of ​​what's going on.

So buckle up and see what you can do.

(audience gasps) Now let's go deep into the nose.

And you can see the soft palate there.

Many of the sounds we make on a daily basis, even simple ones, are incredibly complex.

For example the sound "kh".

It is the soft palate that seals exactly behind the nose.

So, when you say it out loud five times, feel your soft palate snap in the back of your throat.

ku, ku, ku, ku, ku, ku.

Now, when Tom does it, it looks like this.

TT: ku, ku, ku, ku, ku.

Kookaburras and parrots echoed through Kakadu, and I couldn't completely quit ketamine.

(Laughter) (Applause) MB: Well, in the beatbox world, of course you can use beatboxes for all sorts of effects.

I can help you

TT: No problem, we are professionals.

(laughs) (Beatboxing) MB: Okay.

(Applause and cheers) Okay, let's slide down a little more.

Turn off the light and see if you can see the light anywhere in your mouth.

You can see exactly where your camera is.

(laughter) TT: (singing) I was surprised.

(laughs) MB: Okay.

(audience gasps) What you see there is the base of the tongue.

The side wall of the screen is the pharynx.

All muscular walls, and deep dark decks have larynxes.

TT: Oh, should I put the lights back on?

Good idea I think.

If you take it off, it will get a little creepy.

MB: Please turn on the light, thank you.

good.

I have had over 15,000 laryngeal and throat examinations and can say that Tom is anatomically normal like everyone else.

His unique use of every muscle and soft tissue is what allows him to create the amazing sounds you'll hear.

So, let's take a closer look at some of these sounds.

TT: It really does. absolutely.

(laughter) Okay.

(Cheep) (Cheep) (Boo) MB: So what he's doing is using the rhythmic contractions of all the muscles to change the shape and length of the vibrating air column to produce all the sounds you hear.

(beatboxing) (laughter) (bass) MB: And now there's the rhythmic movement - the arytenoid cartilage far below, rocking back and forth to create different sounds.

TT: (bass) MB: And we like to call this "sphincter-based".

(Laughs) And as you can see, folding all the tissue down allows for a different kind of very deep bass.

Well, let's use a local anesthetic, stick a big black hose up his nose, unleash some of his repertoire, and see how all this works.

And we move -- be careful.

TT: Could you raise it just a little bit?

(laughs) TT: (Beatboxing) Maybe a little more -- (laughs) Okay, cool, I think it worked.

(Beatbox) To all my peepers who have come for the abyssal depths, check this out.

(beatbox) (cheers) (applause) (beatbox) Start with the basics and build from scratch.

(record scratch) Yeah.

(beatbox) (trumpet sound) (beatbox) (beatbox) Back to basics.

(Beatbox) (Beatbox) You know the sound.

(Beatbox) Make some noise.

(applause and cheers) (whistling) (applause and cheers) TT: Thank you.

My lecture is "Flying Birds and Space Telescopes".

You might think they shouldn't have anything to do with each other, but hopefully by the end of these 18 minutes you'll see a little bit of a relationship.

Connect with origami. Let's get started.

What is origami?

I think most people know what origami is. It's this: flapping birds, toys, parrot catchers, things like that.

And that was once origami.

But it became something else.

It has become an art form, a sculptural form.

A common theme, origami origami, is how to make a shape.

You know, it's very old. This is a 1797 plate.

It depicts women playing with toys.

If you look closely, you can see this shape called a crane.

All Japanese children learn how to fold that crane.

So this art has been around for hundreds of years, and for something that has been around for this long – something that is so restrictive and can only be folded – you would think that everything that could have been done was done long ago.

And it may have been true.

But in the 20th century came a Japanese folder named Yoshizawa, who created tens of thousands of new designs.

But more importantly, he created the language, the way we can communicate: the code of dots, dashes and arrows.

If you recall Susan Blackmore's talk, we now have the means to transmit information through heredity and selection, and we know where it leads.

And that's what led to this kind of thing in the origami field.

This is an origami figure. One sheet, no cuts, just folds, hundreds of folds.

This is also origami, and shows where modern society is headed.

naturalism. detailed.

Sometimes they grow horns and horns, and if you look closely, you can also see split hooves.

And the question arises, what has changed?

And what changed was unexpected in art, namely mathematics.

That is, people applied mathematical principles to art in order to discover underlying laws.

And that leads to very powerful tools.

The secret to productivity in so many fields, and in origami, is letting dead people do the work.

(Laughter) Because what you can do is turn your problem into a problem that someone else has solved and use the solution.

I would like to tell you how I realized it with origami.

Origami revolves around a pattern of folds.

The fold patterns shown here are the basic blueprints for origami shapes.

And they cannot be drawn arbitrarily.

They must follow four simple laws.

And they are very simple and easy to understand.

The first law is dichroism. You can color any crease pattern with just two colors without having to match the same color.

The direction of folds, that is, the number of mountain folds and the number of valley folds, is always different by 2 at any vertex. Increase by 2 or decrease by 2.

nothing else.

Looking at the angles around the crease, if we number the angles in a circle, we can see that all even numbered angles add up to a straight line and all odd numbered angles add up to a straight line.

And if you look at how the layers stack up, you can see that no matter how you stack the crease and the sheets, the sheet can never penetrate the crease.

These are the four simple rules. That's all you need for origami.

All origami come from there.

And you might ask, "Can four simple laws produce such complexity?"

But really, the laws of quantum mechanics, which you can write down on a napkin, govern all of chemistry, all of life, all of history.

If you follow these laws, you can do amazing things.

So in origami we can employ simple patterns like this repeating pattern of folds called textures to follow these laws, but they are nothing in themselves.

But if you follow the laws of origami, you can put these patterns into different folds, and while they may be very simple in themselves, when you combine them you get something a little different.

This fish has 400 scales, which are also one uncut square, just folded.

If you don't want to fold the 400 scales, you can also get your hands on some work and add plates to the turtle's back and toes.

Or you can ramp up and have up to 50 stars on a 13-striped flag.

And if you really want to go crazy, give your rattlesnake 1,000 scales.

This is also on display downstairs, so if you have the chance, please take a look.

Origami's most powerful tool has to do with the way it obtains parts of living things.

And we can fit that into this simple equation.

If you think of an idea and combine it with a square, you get an origami figure.

(Laughter) What matters is what those symbols mean.

And you might say, "Can you really be that specific?"

In other words, stag beetles have two jaws and antennae. Could you elaborate on that? ”

Yes you really can.

So how do we do that? Well, let's break it down into a few small steps.

Now let's extend that equation.

I start with my own ideas. I abstract it.

What's the most abstract form? Stick figures.

And from that stick figure, I need to somehow arrive at a piece that corresponds to every part of the subject, a folded shape with flaps on each leg.

And once you have the folded shape, called the base, you can taper or bend the legs to turn it into the finished shape.

Well, the first step is very easy.

Come up with an idea and draw a stick figure.

The last step is not too difficult, but the intermediate steps, the steps that go from the abstract description to the collapsed shape, are.

But that's where mathematical ideas get us through.

And I'll show you how to do it so you can get out of here and fold something.

But we're going to start small.

This base has a lot of flaps.

We will learn how to make one flap.

How do you make a single flap?

Take a square. Fold in half, fold in half, fold again, elongate, and finally flap.

You can use it on your legs, arms, etc.

What paper was in that flap?

Now, if you unfold it and go back to the crease pattern, you'll see that the top left corner of that shape is the paper in the flap.

This is the flap and all the rest of the paper remains.

you can use it for other things.

Well, there are also other ways to make flaps.

Other dimensions are available for flaps.

You can use a little less paper if you make the flaps thinner.

If you make the flap as thin as possible, you will reach the limit of the minimum amount of paper required.

As you can see, we need a quarter circle of paper to make the flap.

There are other ways to make flaps.

Placing the flap on the edge uses a half-circle of paper.

And if you make a flap from the middle, it will go around.

So no matter how you create the flaps, you need some circular area of ​​paper.

Now you are ready to scale up.

What if I want to make something with lots of flaps?

what do i need We need a lot of circles.

Then in the 1990s, origami artists discovered these principles and realized that arbitrarily complex shapes could be created simply by packing circles.

And here the deceased people begin to help us. Because many people study the problem of packing circles.

I can draw on the vast history of mathematicians and artists who have studied disc packing and arrangement.

And now you can use those patterns to create origami shapes.

So we came up with the rule of packing circles according to more rules and decorating the circle pattern with lines. Doing so will create creases.

Those creases are folded into the base. You shape the base.

A folded shape is obtained. In this case, it's cockroaches.

And it's very simple.

(Laughter) It's so easy that even a computer can do it.

And you say, "Well, how easy is that?"

But computers need to be able to describe things in very basic terms. With this, it is possible.

So many years ago I created a computer program called TreeMaker. You can download it from my website.

It's free. Works on all major platforms, including Windows.

(Laughs) And just draw the stick figure and it will calculate the crease pattern.

Do circle packing and calculate crease pattern. If you use the stick figure I showed you earlier, you'll see that the deer has horns growing out, but you get this crease pattern.

Folding this crease pattern along the dotted lines will give you a base that can be molded into a deer shape with the desired crease pattern.

And if you don't want a white-tailed deer but want another deer, but you want a mule or moose, you can change the packaging and we can make a moose.

Or you can make an elk.

Or it's actually some other kind of deer.

These technologies have revolutionized this technology.

We found that we can make familiar things such as insects and spiders, things with legs, things with legs and wings, and things with feet and antennae.

You can also fold two mantises out of one uncut square if folding one mantis out of one uncut square isn't fun enough.

she is eating him

I call it "snack time".

You can do a lot more than insects.

This allows for details such as toes and nails. Grizzly bears have claws.

This tree frog has toes.

In fact, many people in the origami field now put their toes on models.

The toes are origami memes. Because everyone is doing it.

You can create multiple subjects.

Well, these are a couple of instrumentalists.

Single square guitarist, single square bassist.

And when you say, "Well, guitars and basses aren't that hot.

Let's try some more complicated instruments. ”

Then you can play the organ.

(Laughter) And this has allowed us to create origami on demand.

So people can say "I want exactly this and this and this" and they can actually fold it.

And sometimes they create high art, and sometimes they do commercial work to pay for it.

But I would like to show you some examples.

Except for the car, everything here is origami.

(Video) (Applause) Just to show you, this is really folded paper.

Computers moved things, but these were all real folded objects that we made.

And I found this to be useful not only in the visual world, but in the real world as well.

Amazingly, origami and the structures we develop with origami have found applications in medicine, science, space, the human body, consumer electronics, and more.

I would like to share some examples of these.

One of the earliest, this pattern, this folded pattern, was studied by a Japanese engineer, Koryo Miura.

He studied the folding pattern and found that this allowed it to fold into a very compact package with a very simple opening and closing structure.

And he used it to design this solar array.

This is an artist's rendition, but it was flown by a Japanese telescope in 1995.

Well, the James Webb Space Telescope actually has a little origami, and it's very simple.

The telescope rises into space and unfolds in two locations.

It will be folded in three. It's a very simple pattern, you can't even call it origami.

I certainly didn't need to speak to an origami artist.

But if you want to go taller and even bigger than this, you may need origami.

Engineers at Lawrence Livermore National Laboratory had an idea for an even larger telescope.

They called it glasses.

The design called for a 25,000-mile geostationary orbit and a 100-meter diameter lens.

So imagine a lens the size of a football field.

Those interested in this were divided into two groups. Planetary scientists who want to look up and others who want to look down.

Looking up or down, how do you float in space? We have to carry it there by rocket.

And rockets are small. Therefore it should be smaller.

How do you make a large sheet of glass smaller?

Well, there is no other way but to fold it somehow.

So you should do something like this:

This was a smaller model.

In a folded lens, divide the panels and add deflection.

However, this pattern doesn't work to reduce distances of 100 meters down to a few meters.

So Livermore engineers wanted to use the work of dead or living origami artists and said, "Let's see if anyone else is doing something like this."

So they looked into the origami community, we reached out to them, and I started working with them.

And we have jointly developed a pattern that allows flat rings and discs to fold into very neat and compact cylinders while accommodating arbitrarily large sizes.

And they adopted it in the first generation, it was 5 meters, not 100 meters.

But this is a 5 meter telescope with a focal length of about 400 meters.

And it works flawlessly in our test range and certainly folds up into a neat little bundle.

Well, there are other origami in space too.

When the Japan Aerospace Exploration Agency flew the solar sail, you can see that the sail has spread and creases remain.

The problem being solved here is that it needs to be large and sheet-like at its destination, but small while traveling.

And it works whether you go to space or just get inside your body.

And this example is the latter.

This is a cardiac stent developed by Zhong You of the University of Oxford.

It keeps a blocked artery open when it reaches its destination, but it has to shrink further to travel through the blood vessel to its destination.

This stent is then folded using an origami pattern, based on a model called a hydrogen bomb base.

Airbag designers also face the problem of fitting flat seats into tight spaces.

And they want to do the design by simulation.

Therefore, you need to figure out how to flatten an airbag with a computer.

The algorithm we developed for insects turned out to be a solution for performing airbag simulations.

And they can do simulations like this.

Origami folds are formed. You can see if it works by watching the airbag inflate.

And that leads to some very interesting ideas.

You know, where did these things come from?

Well, the heart stent was born out of that little explosion box you might have learned about in grade school.

This one follows the same pattern and is called a hydrogen bomb base.

Algorithms for flattening airbags grew out of all the developments in circle packing and a mathematical theory that was really only developed to create insects, things with legs.

The problem is that this often happens in mathematics and science.

When mathematics is involved, problems solved for the sole purpose of aesthetic value or to create something beautiful are transformed into real-world applications.

And as strange and surprising as it may sound, origami might even save lives one day.

thank you.

(applause)

At 6:30 in the morning, Kristen is wheeling a prostate patient into the operating room.

She is a resident doctor and a surgeon in training.

It's her job to learn.

Now she really wants to do a very delicate, nerve-saving anatomy that will allow her to maintain her erectile function.

It's up to the attending surgeon, but he's not there yet.

She and her team laid the patient down and made the first 8-inch incision in her lower abdomen.

After tightening, she told the nurse to call the person in charge.

He arrives, dressed in a gown, and from there on their four hands are mostly in the patient, he directs, but Christine leads the way.

When the prostate is out (and yes, he's saved Kristen a little nerve), strip the scrub.

He starts doing paperwork.

Kristen sees the patient by 8:15, with a junior resident watching over her shoulder.

And she let him do the final stitches.

Kristen feels great.

The patient will be fine, and she's definitely a better surgeon than she was at 6:30.

This is extreme work.

But Christine, like most of us, is learning how to do her job. Observe the experts a bit, get involved in the easy and safe parts of the job, and move on to the more dangerous and harder tasks when they guide and decide you are ready.

I have been fascinated by this kind of learning all my life.

I feel it is part of what makes us human.

This goes by many names, including apprenticeship, coaching, mentorship, and on-the-job training.

In surgery, we say "see, do, tell". But the process is the same, and for thousands of years it was the primary avenue for acquiring skills around the world.

Right now, we're dealing with AI in ways that get in the way.

We sacrifice learning in the pursuit of productivity.

I first discovered this in surgery when I was at MIT, but now I have evidence of it happening everywhere, in completely different industries and different types of AI.

If we do nothing, millions of people will hit a wall trying to learn how to deal with AI.

Let's go back to surgery and see how it works.

Fast forward six months.

At 6:30 am again, Kristen drives another prostate patient, this time to the robotic operating room.

A lead with four arms who attaches a 1,000-pound robot to a patient.

They both strip off their scrubs and head for the control console 10-15 feet away, while Kristen just watches.

With the robot, the caregiver can do all the procedures by himself, so basically the caregiver does it.

He knows she needs practice.

He wants to give her the initiative.

But he also knows she will slow down and make more mistakes, and his patients come first.

So Christine has no hope of getting close to those nerves during this rotation.

I would be lucky if I could operate for more than 15 minutes during a four hour operation.

And she knows he taps the touch screen when she makes a mistake. And she'll be watching it again feeling like a kid in a dunce hat in a corner.

Like all my research on robots and work over the past eight years, I started this one with a big open question. “How do we learn how to operate intelligent machines?”

To find out, I spent two and a half years observing dozens of residents and surgeons performing traditional and robotic surgery, interviewing them and generally interacting with residents they were trying to learn.

I interviewed 18 of the top teaching hospitals in the US and the situation is the same.

Most residents were in the same position as Kristen.

There was a lot to 'see', but very little to 'do'.

So they couldn't struggle and they couldn't learn.

This was important news for surgeons, but I needed to know how widespread it was. What other countries are using AI to block on-the-job learning?

To find out, I connected with a small but growing group of young researchers who have been investigating AI-involved work in the field in very diverse settings, including start-ups, law enforcement, investment banking, and online education.

Like me, they spent at least a year and hundreds of hours observing, interviewing, and often working with the people they studied.

We shared data and looked for patterns.

Regardless of industry, job or AI, the story was the same.

Organizations were increasingly trying to get results from AI, pulling learners away from the work of experts in the process.

Start-up owners outsourced contact with customers.

Police have had to learn how to deal with crime predictions without expert support.

Young bankers were left out of complex analyses, and professors had to build online courses unaided.

And all these effects were the same as with surgery.

Learning on the job has become increasingly difficult.

This won't last long.

McKinsey estimates that by 2030, 500 million to 1 billion people will need to adapt AI in their daily work.

And we assume that on-the-job learning will help us when we challenge ourselves.

According to Accenture's latest employee survey, most employees learned key skills on the job rather than in formal training.

So while we often talk about its potential future impact, the aspect of AI that may be most important right now is treating it in a way that hinders on-the-job learning when it's most needed.

Now on all of our sites, a minority of people have found a way to learn.

They did it by breaking and bending the rules.

The approved methods didn't work, so I bent and broke the rules to get some hands-on practice with the experts.

In my environment, residents sacrificed their generalist education to participate in robotic surgery in medical school.

And I spent hundreds of extra hours on simulators and documenting surgeries when I should have learned in the operating room.

And perhaps most importantly, they found a way to struggle with the actual procedure with limited expert supervision.

I call all this "shadow learning". This is to bend the rules and keep the learners out of the limelight.

And because the result comes out, everyone pretends not to see it.

Remember, these are the star students of the collective.

Now, obviously this is neither OK nor sustainable.

You don't have to risk getting fired to learn the skills you need for the job.

But we have to learn from these people.

They took serious risks to learn.

They understood the need to protect the struggles and challenges at work so that they could push themselves to tackle difficult problems that were near the limits of their abilities.

We also made sure we had experts nearby to offer advice and safeguard against catastrophe.

Build this combination of struggle and expert support into each AI implementation.

Here's one clear example of this that I got in the field.

Before robots, bomb disposal technicians would walk up to an IED and deal with it.

The junior officer was several hundred feet away and could only watch and help if you invited him out of range if you thought it was safe.

Now you are sitting side by side in a bomb proof truck.

You both looked at the video feed.

They control their robots from a distance, and you shout out commands to do their work.

Trainees learn better than before the robot was introduced.

You can extend this to surgery, startups, police, investment banking, online education, and more.

The good news is that there are new tools to do just that.

Thanks to the internet and the cloud, we no longer need one expert per trainee at all times, nor do trainees need to be physically close or in the same organization.

And AI can be built to coach learners when they're struggling, to coach experts when they're coaching, and to connect those two groups in smart ways.

There are people working on such systems, but they mostly focus on formal training.

And a deeper crisis lies in learning at work.

we have to do better.

Today's challenges demand that you improve your skills as you work, while creating jobs that take full advantage of AI's amazing capabilities.

It's the kind of future I dreamed of when I was a kid.

And now is the time to create it.

thank you.

(applause)

Do you remember your first kiss?

Or when you burn the ceiling of your mouth with a hot slice of pizza?

How about playing tag, ducks, ducks and geese as a kid?

These are all examples of how we use touch to make sense of something.

And that is the basis of haptic design.

"tactile" means of or relating to the sense of touch;

And we've all used it throughout our lives.

As I was working on my computer, a friend walked up behind me who saw me hunched over and typing.

She placed her left thumb on the left side of my hip and extended her right index finger in front of my right shoulder.

Without thinking, I straightened my back and sat down.

With quick, gentle gestures, she showed me how to improve my posture.

The thesis I was working on at that very moment focused on developing new ways to teach movement using technology.

I wanted to make a suit that could teach people kung fu.

(Laughter) But I didn't know how to convey the movements without an instructor in the room.

And in that moment it became very clear. It's a "feel".

Putting a vibration motor where she puts each finger, combined with motion capture data of my current optimal posture, allows me to simulate the entire experience without the need for an instructor to be in the room.

But one key piece of the puzzle was still missing.

If I want my wrists to lift 2 inches above my knees using vibration, how do I tell it to do so?

If you put a motor on top of your wrist, will you be able to lift it?

Or do you wear it under your wrist and feel a push up?

There was no readily available answer, as there was no commonly agreed-upon tactile language for communicating information.

So my co-founder and I set out to create that language.

And the first device we built wasn't a kung fu suit.

(Laughter) But in a way it was even more impressive because of its simplicity and convenience.

We started with the navigation use case, which is a simplified form of navigation.

We then created Wayband, a wrist-worn device that can use vibration cues to direct the user towards a destination.

We had people twirl and stop in whatever way they thought was right.

Unofficially, I've tried this with hundreds of people, and most of them figured it out within about 15 seconds.

It was intuitive.

In the beginning, we were just trying to get people off their phones and back into the real world.

But the more we experimented, the more we realized that the people who benefit most from our work are those with little or no vision.

When we first consulted groups of the blind, they told us, 'Don't build blind devices.

Build devices that everyone can use and are optimized for the blind experience. ”

We founded WearWorks with three core principles: make cool things, create the biggest impact of a lifetime, and reimagine the entire world designed for touch.

And on November 5, 2017, Wayband helped a blind person run the first 15 miles of the New York City Marathon without the assistance of a blind person.

(Applause.) The heavy rain prevented him from finishing the race, but that didn't matter.

(Laughter) We've proven that you can navigate complex routes using just touch.

Then why touch?

Our skin has an innate sensitivity similar to the eye's ability to perceive millions of colors, or the ear's ability to perceive complex pitches and tones.

As a communication channel, however, it has been largely relegated to mobile phone notifications like Morse code.

If you are suddenly kissed or punched, you will react instinctively and immediately.

Meanwhile, your brain is catching up on the backend, and you end up understanding what happened in detail.

And compared to instinct, conscious thought is rather slow.

However, compared to the pace of language acquisition of snails, it is lightning speed.

I've spent a fair amount of time learning Spanish, Japanese, German, and now Swedish, and have failed to varying degrees.

(Laughter) But among those failures was the core of how different languages ​​were organized.

This provided our team with insight into how the linguistic order of fully established languages ​​could be used as inspiration for an entirely new tactile language based purely on contact.

I've also found that using language mechanisms is not the best way to convey information.

Just as a smile is a smile in every culture, what if there were underlying mechanisms of contact that transcended language and cultural boundaries?

Some kind of universal language.

You see, when I give you "boom boom" "boom" you will eventually learn that that particular vibration means "stop".

However, as haptic designers, we challenged ourselves.

What would happen if we designed "Stop"?

Well, depending on the situation, most of us have been in a car and experienced the car's sudden stop and our body's reaction to it.

So if you want me to stop, I can send you a vibration pattern, sure.

Or you can design a haptic experience that makes it feel right to stop.

It is not enough to arbitrarily assign tactile cues to meaning.

It requires deep empathy.

It also requires the ability to distill human experience into meaningful insights, and further into haptic gestures and products.

Haptic design extends the human ability to sense and react to both physical and virtual environments.

There is a new frontier called touch.

And it has the power to change the way we all see the world around us.

thank you.

(applause)

Hi guys.

So the two of us are here to show an example of creation.

And I'm going to fold one of Robert Lang's models.

This is what the paper is made of, and you can see all the necessary creases on it.

Rufus will be improvising on a custom 5-string electric cello and it will be great to hear him play.

Are you ready? OK.

Just to make it a little more exciting.

have understood. Take it away, Rufus.

(music) Okay. Here you go.

(laughter) (applause)

A clap of thunder and lightning illuminates the rolling sea, and the ship bends under the waves.

This is no ordinary storm, but a violent, vengeful storm that sets the stage for one of Shakespeare's most enigmatic plays.

As the skies clear, we are invited to a world that seems far removed from ours, yet filled with familiar concerns about freedom, power, and control.

Tempest is set on a deserted island ruled by magic and power by the exiled Duke of Milan, Prospero.

Betrayed by his brother Antonio, Prospero is stranded on the island for twelve years with his daughter Miranda and her beloved book.

This time, he learns the island's magic and uses it to harness its rudimentary spirits.

He also rules over the dejected and demonized Caliban, the only surface inhabitant of the island.

But after years of plotting revenge, Prospero's enemies finally made their appearance.

With the help of the flying fairy Ariel, the sorcerer destroys his brother's ship and throws the crew ashore.

Prospero's intrigue extends to his daughter's romance, and he plots to make him fall in love with the stranded prince Ferdinand.

And as Prospero and Ariel close in on Antonio, Caliban teams up with the drunken sailors to come up with a ludicrous plan to take the island.

The play is thoroughly stripped of society's most vile desires, with each faction eagerly seeking power over the destinies of the land, others, or themselves.

But Shakespeare knows that power is always a moving target. And as he uncovers the dark histories of these characters, we begin to wonder if this vicious cycle will ever end.

Prospero has been wronged by Antonio, but has long been abusive to the island, hoarding its magical properties and natural resources for himself.

Caliban is particularly upset about the acquisition.

Son of Sycorax, the witch who once ruled the island, he initially helped the exiles find a foothold.

But he has been their slave ever since, and cries out with bitter remorse. "And I loved you/And I showed you all the qualities of this island/Fresh springs, saltwater pits, barren and fertile places./Cursed me for doing so!" Caliban, with his thunderous words and seething rage, always reminds Prospero of the former. It was the mine of this island by Mother Sycorax, which you stole from me.

However, Sycorax also abused the island and imprisoned Ariel until Prospero was released.

Now Ariel spends the play hoping to pay off her debts and win her freedom, while Caliban is enslaved indefinitely, or at least while Prospero remains responsible.

For these reasons and many others, The Tempest is often read as an exploration of colonialism and the moral dilemmas that come with encountering a Brave New World.

Issues of subjectivity and justice hang in the play. Is Caliban the rightful owner of this land?

Will Ariel be able to flap her wings freely?

And is Prospero a powerful overseer, or is there a deeper magic at work that the characters alone cannot comprehend?

Throughout the play, Ariel constantly reminds Prospero of the freedom she owes.

But the question remains whether the invaders will be able to relinquish their control.

The question of ending one's reign is particularly relevant since The Tempest is considered to be Shakespeare's last play.

In many ways, Prospero's actions mirror those of himself, a great entertainer who crafts elaborate plots, manipulates the people around him, and enchant characters and audiences alike.

But by the end of an epic performance of power and control, Prospero's final lines find him humbled by his audience and the power they have over his work.

"With the help of your tender hand/Your gentle breath fills my sails/Without it my project fails/It was a pleasure."

This is a reminder of Shakespeare's own role as the great entertainer who finally surrenders to our applause.

In 1956, architect Frank Lloyd Wright proposed a one-mile-tall skyscraper.

It was to be the tallest building in the world, five times taller than the Eiffel Tower.

However, many critics mocked the architect, arguing that people would have to wait for hours for an elevator, or worse, that the tower would collapse under its own weight.

Even though most engineers agreed and the proposal was advertised, the giant tower was never built.

But today, more and more buildings are being built around the world.

Companies are even planning skyscrapers over a kilometer high, like Saudi Arabia's Jeddah Tower, which is three times the size of the Eiffel Tower.

Soon, Wright's mile-high miracle may become a reality.

So what was it that stopped us from building these megastructures 70 years ago? How can you build a mile-tall structure today?

In any construction project, each floor of the structure must be able to support the floor above it.

The taller the building, the higher the gravitational pressure from the floor above to the floor below.

This principle has long determined the shape of our buildings, which is why ancient architects favored pyramids with wide foundations that supported light upper levels.

However, this solution does not translate perfectly to city skylines. The pyramid will be about 1.5 miles wide and difficult to squeeze into the center of the city.

Luckily, you can avoid this impractical shape by using a tough material like concrete.

Modern concrete mixes are also reinforced with steel fibers for strength and formulated with water-reducing polymers to prevent cracking.

The concrete of Dubai's Burj Khalifa, the world's tallest tower, can withstand approximately 8,000 tons of pressure per square meter. This is equivalent to the weight of over 1,200 African elephants.

Of course, even if the building is self-supporting, it still needs support from the ground.

Without a foundation, a building this heavy would sink, topple, or lean.

192 concrete and steel pillars, called piles, were buried more than 50 meters deep to prevent subsidence of the approximately 500,000-ton tower.

The friction between the piles and the ground keeps this huge structure standing.

A skyscraper must not only overcome the force of gravity that pushes the building down, but also the wind that pushes it from the side.

On an average day, wind can exert up to 17 pounds per square meter on a skyscraper, weighing as much as a bowling ball in a gust of wind.

Aerodynamically designed structures, like China's sophisticated Shanghai Tower, can reduce their forces by up to a quarter.

Also, like the Lotte Tower in Seoul, wind-resistant frames inside and outside the building can absorb the remaining wind force.

But even with all these precautions, a hurricane can cause the top floor to sway back and forth over a meter.

To prevent the top of the tower from swaying in the wind, many skyscrapers employ counterweights weighing hundreds of tons called "tuned mass dampers." For example, Taipei 101 suspended a giant metal sphere above the 87th floor.

When the wind moves the building, this sphere sways and moves, absorbing the building's kinetic energy.

As that motion tracks the movement of the tower, hydraulic cylinders between the ball and the building convert that kinetic energy into heat, stabilizing the swinging structure.

Proper deployment of all these technologies allows our megastructures to remain upright and stable.

However, moving quickly through such a large building is difficult in itself.

In Wright's time, the fastest elevators traveled at just 22 kilometers per hour.

Thankfully, today's elevators are much faster, traveling at over 70 km/h. Future cabins will use frictionless magnetic rails and may be even faster.

Traffic management algorithms also group passengers by destination to ensure passengers and empty cabins where needed.

Skyscrapers have come a long way since Wright proposed a mile-tall tower.

An idea that was once considered impossible became an architectural opportunity.

Today, it may only be a matter of time before one building makes another leap forward.

It was Thursday, June 23, 1994.

(sighs) "Pack your bags. Feel free to go.

If you are taken outside, head to the car immediately.

Don't talk to reporters. ”

My head is spinning, my heart is pounding, and I can't breathe.

I just want to get out of there.

When you get to your car, just throw everything back and collapse into the driver's seat.

"I can't do that.

You can't pretend to be happy when you go home to a family you haven't seen in a week. ”

Their love and support could not help me during this special time.

We had just sentenced a man to death.

So?

Do you just go home and wash the dishes?

In Mississippi, the death penalty is kind of part of the unspoken culture.

The basic logic is that if you kill someone, you get the death penalty.

So when the jury selection process took place, the jurors asked me: "If the evidence presented justifies the death penalty, can you reasonably and unreservedly hand down the death penalty?"

My answer was a resounding yes, and I was selected second on the jury.

The trial has started.

From the evidence presented and the pictures of the victims, my first reaction was, "Yes, this man is a monster and deserves the death penalty."

For days I sat and stared at his hand, his knife hand, and his pasty white skin, his eyes...

Yes, he spent so many days in a cell without sunlight that his eyes were as black as his hair and mustache.

He was very intimidating and his guilt was beyond any doubt.

But regardless of his guilt, as the days went by, I came to see this monster as a human being.

Something was changing in me, but I couldn't understand it.

I was starting to ask myself if I wanted to give this man the death penalty.

Jury deliberations began, and the judge gave us instructions to the jury, which were to be used as tools on how to reach a verdict.

Well, I only got one decision from using this tool and it was the death penalty.

I felt cornered.

My mind and heart were at war with each other, and the thought of the death penalty made me sick.

However, following the judge's instructions, I gave up as a law-abiding person.

I gave up and voted with 11 other jurors.

And that's where our broken justice system worked.

So now I'm thinking in the car: How will my life ever be the same as before?

My life was just a normal, ordinary life: kids, work, church, ball games.

Everything felt like a trifle now.

I was down this rabbit hole.

Anger, anxiety, guilt, depression...

It just stuck to me.

I decided I had to start my life again, so I sought counseling.

A counselor diagnosed me with PTSD and said the best way to overcome PTSD was to talk about the trauma.

But when I talked or tried to talk about trauma outside of her office, she was shut down.

Nobody wanted to hear about it.

he was just a killer. get over it.

That's when I decided to become a silent survivor.

Twelve years later, in 2006, Bobby Wiltcher dropped all appeals and learned that his execution date was approaching.

It was like being punched in the stomach.

All the buried emotions came back.

In an attempt to find peace, I called Bobby's lawyer and said, "Can I see Bobby before he is executed?"

On the day of the execution, as I drove to prison, I knew in my mind that Bobby was going to go into a manic state.

But surprisingly he was very calm.

And for two hours he and I sat there talking about life, and I could ask him to help him die.

His words to me were: "No need to apologize.

you didn't put me here

I did this myself.

But if it makes you feel better, I'll forgive you. ”

On the way home, I stopped at a restaurant and bought a margarita.

(Laughter) I don't think you can get one big enough -- (Laughter) I'll try to stay calm.

The phone rang.

It was Bobby's lawyer.

Within two minutes of his execution they gave him a reprieve.

This stay gave me time to contact Bobby.

And as crazy as it sounds, we became friends.

Three months later he was executed by the state of Mississippi.

I came here to tell my story because a friend encouraged me just 22 years later when I was even feeling open enough to talk about this.

"Hey, maybe we need to talk to the other jurors.

You've had the same experience, haven't you? ”

I had no idea what I was looking for so I had to speak to them.

So I started searching and actually found most of them.

The first jury I met thought Bobby had a right.

Another juror was a little disappointed that the verdict took too long.

Then one of the jurors, who doesn't know what the problem was, remembers nothing of the trial.

(Laughter) Well, I'm thinking in my mind.

Well, thank God for Allen.

Allen had a kind heart.

And when I spoke to him, he was genuinely upset with our decision.

And he told me of the day the devastation hit him in earnest.

He was listening to the radio, which had a list of names of men to be executed at Parchman Prison.

He heard Bobby's name and really understood what he had done.

And he said, "I was responsible for that man's death."

Twenty-odd years later, Allen is still grappling with that problem.

And he never told anyone about it, not even his wife.

He also said Mississippi needs to offer jurors counseling if it wants to keep the death penalty.

The next juror I met was Jane.

Jane is now totally against the death penalty, and so was Bill.

Bill said he was severely depressed for several weeks, and when he returned to work, a colleague said something like, "Hey, did you stir-fry that guy?"

To them it was just a joke.

Then there was John.

John said his decisions weighed heavily on him and weighed him down every day.

The last juror I spoke to was Ken.

Ken was the jury president.

As we sat and talked, it was evident that he was deeply saddened by what was required of us.

He said he literally broke down in tears remembering the day he left the courthouse, drove home, stuck the key in the door and went to unlock it.

He said he knew Bobby was guilty but didn't know if the decision he had made was the right one.

And he played it over and over again in his head.

did we do the right thing?

did we do the right thing?

did we do the right thing?

(sighs) After all these years, I finally realized that I wasn't the only disillusioned juror.

And we talked about sharing our experiences with potential jurors to give them insight into what to expect and tell them not to be complacent. know what you believe. You have to know where you stand and be prepared. Because I don't want to be on the jury one morning and leave feeling like a murderer at the end of the trial.

Well, through this storm in my life, I have found some inspiration and it came in the form of my granddaughter.

My 14-year-old granddaughter Maddy was writing an essay on the death penalty at school and was asking me questions.

Yes, I realized that this child was raised in the same eye-for-an-eye culture that I was, or was once.

So I explained my experience to her like this. Sentencing someone to death while serving on a jury.

And I asked her, "Is that what made me a murderer?"

she couldn't answer.

At that time, I felt that this topic was open for discussion.

And what do you think happened?

Just recently, I was invited to speak in the abolitionist community.

I got a T-shirt while I was there.

It reads, "Abort the execution."

Well, when I got home, I had my granddaughter, Anna, who is 16, and I said, "Can I have that shirt?"

Well I looked at her father and her father was my son. And it turns out he's still working on this death penalty issue.

So I turned and looked at her and said, "Would you like to wear this?"

So she turned and looked at her father and said, "Dad, I understand how you feel, but I don't believe in the death penalty."

My son looked at me, shook his head, and said, "Thank you, Mom."

And I knew it wasn't a nice "thank you, mom."

(Laughter.) So I knew that life had taught me some lessons.

I learned that if I hadn't been on that jury, I would still be thinking the same way.

It also gave me confidence to see through the eyes of my granddaughters that this young generation is capable and willing to tackle these difficult social issues.

And because of my experience, my granddaughters are developing the ability to be independent and think for themselves, rather than relying on cultural beliefs.

So coming from a conservative, Christian family in a very conservative state in the United States, I am here to tell you that the death penalty has new opponents.

thank you.

(applause)

Or am I the only one here who is a little disappointed in democracy?

(Applause.) So let's look at some numbers.

Globally, the median voter turnout in presidential elections over the last 30 years has been just 67%.

Now, if you go to Europe and look at the people who participated in the EU parliamentary elections, the median voter turnout in those elections is only 42 percent.

Well, let's go to New York and see how many people voted in the last mayoral election.

You can see that only 24 percent of people turned up to vote.

What this means is that if Friends were still running, Joey and perhaps Phoebe would have turned up on the ballot as well.

(Laughter.) And people are sick of politicians, so you can't blame them.

And people are fed up with the data they generate being used by others to communicate with friends and family, or be the target of political propaganda.

But the thing is, this is nothing new.

These days, some people use "Like" as a propaganda target before using zip code, gender or age. Because the idea of ​​propaganda for political purposes is as old as politics.

And the reason we have such an idea is because democracy is fundamentally vulnerable.

This is the representative's thoughts.

In principle, democracy is the ability of people to exercise power.

In practice, however, we must delegate that power to representatives who can exercise it on our behalf.

Its representative is the bottleneck, that is, the weak point.

If you want to attack democracy, that's where you want to target. Because democracy can be captured either by capturing its representatives or by capturing the way people choose democracy.

So the big question is, is this the end of history?

Is this the best we can do, or are there really alternatives?

Some are thinking of alternatives, one of which is direct democracy.

This is the idea of ​​bypassing politicians entirely and having people vote directly on issues and directly on bills.

But this idea is sweet because there are too many things to choose from.

If you look at the 114th Congress, you'll see that the House of Representatives considered over 6,000 bills, the Senate considered over 3,000 bills, and passed over 300 laws.

These are probably the many decisions each person has to make in a week on a topic they know very little about.

So, trying to think of direct democracy as a viable alternative raises a huge cognitive bandwidth problem.

So some people think about the idea of ​​liquid democracy, or fluid democracy. This is the idea that you can endorse your political power to someone, who can endorse it to someone else, and eventually build a large network of supporters, and finally there will be a few people who make decisions on behalf of your supporters and all of their supporters.

But this idea also doesn't solve the cognitive bandwidth problem, and to be honest, it's very similar to the idea of ​​having a delegate.

So what I'm going to do today is to be a little provocative and ask you guys a question. What if instead of trying to avoid politicians, try to automate them?

The idea of ​​automation is not new.

It started more than 300 years ago when French weavers decided to automate their looms.

The winner of that industrial war was Joseph-Marie Jacquard.

He was a French weaver and merchant who combined a loom with a steam engine to develop an autonomous loom.

And in those autonomous looms he gained control.

He was able to create more intricate and sophisticated fabrics than he could have made by hand.

But also by winning the industrial war, he laid out what became the blueprint for automation.

For the last 300 years, the way we automate things has always been the same. First identify a need, then build a tool (in this case, a loom, for example) to meet that need. Then research how people use that tool to automate that user.

So we went from mechanical looms to autonomous looms, and it took 1,000 years.

Today, it will take only 100 years to automate a car using the same script.

But the point is, this time automation is much more real.

Here is a video of a factory that manufactures solid state drives that a colleague at Toshiba shared with me.

The entire factory is a robot.

There are no humans in the factory.

And robots will soon leave the factory and become part of our world and part of our workforce.

So what I do in my day job is create tools that really consolidate data across nations so that we can eventually build the foundation we need for the future where we also need to manage those machines.

But I'm not here today to talk about these tools that integrate data from different countries.

But I'm here to share another idea that might help us think about how we might use artificial intelligence in democracy.

Because the tools I build are designed for executive decision making.

These are decisions that can be affixed to a certain term of objectivity: public investment decisions.

But there are legislative decisions, and legislative decisions require communication between people with different points of view, they require participation, they require discussion, they require deliberation.

And we've long thought that what we need to improve democracy is actually more communication.

So every technology we've advanced in the context of democracy, whether it's newspapers or social media, has tried to give us more communication.

But we've fallen down the rabbit hole and know that's not going to solve the problem.

Because this is a cognitive bandwidth issue, not a communication issue.

So if the problem is one of cognitive bandwidth, communicating more with people is not going to solve the problem.

What is needed instead is the introduction of other technologies to help deal with some of the overloaded communications.

Think of things like little avatars, software agents, and digital Jiminy Cricket (laughs). They can basically answer things for you.

And with that technology, we could offload some of the communication, perhaps supporting better decision-making and decision-making at scale.

And the problem is that the idea of ​​software agents is not new either.

We already use them all the time.

We use software agents to choose how to drive to a particular location, choose what music to listen to, and get suggestions for what books to read next.

So in the 21st century there are ideas as obvious as the idea of ​​combining a steam engine and a loom in the age of Jacquard.

And the idea is to combine direct democracy with software agents.

Just imagine. Imagine a world where, instead of having a representative representing you and millions of other people, you have a representative representing only you, your nuanced political views—a strange mix of libertarian and liberal, and maybe a little conservative on some issues and very progressive on others.

Politicians these days are packages and full of compromises.

However, if you intend to abandon the idea that the representative is human, there may be someone who can represent only you.

If that representative is a software agent, then there will be a Senate with as many senators as there are citizens.

And those senators will be able to read every bill and vote on each bill.

So perhaps there are obvious ideas that we would like to explore.

However, I understand that in this day and age, this thought may be very frightening.

In fact, the idea of ​​robots coming from the future to help us run our governments seems terrifying.

But we have been there before.

(Laughter) And actually he was a very nice guy.

So what would the Jacquard loom version of this idea look like?

It will be a very simple system.

Imagine a system where you log in, create an avatar, and then start training your avatar.

So you can provide your avatar with your reading habits, connect to social media, or connect to other data such as psychological tests.

And the nice thing about this is that there is no deception.

We provide the data to communicate with friends and family and it is not used by the political system.

You are providing data to systems designed to be used to make political decisions on your behalf.

Then get that data and choose a training algorithm. This is because it is an open marketplace where different people can submit different algorithms to predict how they will vote based on the data you provide.

And since the system is open, no one controls the algorithms. Some algorithms become more popular, while others become less popular.

Finally, you will be able to audit your system.

You can see how your avatar is working.

If you like it, you can leave it on autopilot.

If you want a little more control, you can actually choose to ask them every time they make a decision, or you can be anywhere in between.

One of the reasons we don't use democracy much may be that democracy's user interface is so bad.

And improving democracy's user interface might make it even more useful.

Of course, you will have many questions.

So how do you train these avatars?

How do you keep your data safe?

How can the system be distributed and auditable?

What about your 80 year old grandmother who doesn't know how to use the internet?

Believe me, I hear them all.

So you have to beware of pessimists when considering ideas like this. Because pessimists are known to have problems with any solution.

(Laughter) So I want you to think about the bigger idea.

The question I just indicated is a question about how this doesn't work, so just an idea.

The big idea is the idea, "If this works, what else can I do with it?"

And one of those ideas is who writes the laws.

At first, we could use the avatars we already had to vote for laws written by senators and politicians we already had.

But if this works, we can create an algorithm that tries to create laws that get a certain percentage of approvals, and we can reverse the process.

Now, the idea is silly and you might think it shouldn't be done, but there's no denying that it's only possible in a world where direct democracy and software agents are viable forms of participation.

So how can we start a revolution?

We will not start this revolution with picket fences, protests, or demanding that current politicians be turned into robots.

It doesn't work.

It's much simpler, much slower, and much more humble.

We start this revolution by building simple systems like this in graduate schools, libraries, and nonprofits.

And I try to solve all the little questions and little problems that have to be solved to make this idea viable, to make this idea credible.

And as we build a system in which 100, 1,000, 100,000 vote in a non-politically binding way, we will develop faith in this idea, the world will change, and people as small as my daughter today will grow up.

And by the time my daughter is the same age as me, maybe this idea that I know is so crazy today might not be crazy to my daughter or her friends.

And at that point, we will have the end of history, but they will have the beginning of history.

thank you.

(applause)

In our culture, we tend to think that sex is more important to men than it is to women.

But it's not.

The fact is that women are often more embarrassed to talk about it.

More than half of women silently suffer from some form of sexual dysfunction.

I'm hearing more and more about the orgasm gap.

It's like the pay gap, but it's a lot more nasty...

(Laughter) Heterosexual women tend to climax less than 60 percent during sex.

Men climax in 90 percent of sex.

To combat these problems, women have been marketed faulty drugs and testosterone creams...

Even untested genital injections.

The problem is that female sexuality cannot be solved with drugs.

Because it's not broken, because it's misunderstood.

Our culture has had a distorted and medically inaccurate image of female sexuality for centuries.

If more than half of women have some sort of sexual problem, our ideas of sexuality may not apply to them.

We need a clearer understanding of how women actually work.

I am a journalist and recently wrote a book about how our understanding of female sexuality is evolving.

So sexuality itself was defined at a time when men dominated science.

Male scientists tended to see female bodies through their own distorted lenses.

I could have asked the women about their experiences.

Instead, they explored the female body as if it were an exotic landscape.

Even today, we discuss female ejaculation and the existence of the G-spot as if we were discussing aliens and UFOs.

"Are they really there?"

(Laughter.) All of this is doubly true about LGBTQI female sexuality, which has been hated and erased in certain ways.

Ignorance about the female body goes back centuries.

It dates back to the beginning of modern medicine.

Think back to the 16th century, the age of the scientific revolution in Europe.

Ideamen were challenging old dogma.

They were building a telescope to look up at the stars.

We were making progress...

sometimes.

You know, the fathers of anatomy, I call them "fathers" because to be honest they were all men, they felt between the legs of women, trying to sort out what they saw.

They had no idea what to do with the clitoris.

It doesn't seem to have anything to do with having children.

A leading anatomist of the time asserted that this was probably some kind of abnormal growth (laughs) and that the woman who had it was probably hermaphroditic.

It got so bad that parents sometimes had their daughter's clitoris removed if it was deemed too big.

That is correct.

What we think of as female genital mutilation today was practiced in the West in the late 20th century.

You have to wonder: if they're so confused about women's bodies, why didn't they ask women for a little help?

But you must be thinking, "It's all history.

It's a different world now.

Women have it all.

They have birth control pills, they have sexting, Tinder, and Buzzling. ”

(Laughter) Things should be better now.

However, medical ignorance of the female body continues.

How many people are aware of this?

It is the complete structure of the clitoris.

We think of the clitoris as a small bump the size of a pea, but it actually extends deep into the body.

Most of it is under the skin.

It contains about the same amount of erectile tissue as the penis.

beautiful.

It looks a bit like a swan.

(Laughter) This sculpture was created by an artist named Sophia Wallace as part of her 'Cliteracy' project.

(Laughter) She believes we need more "literacy." And that's true, given that this structure was just fully 3D mapped by researchers in 2009.

It was after mapping the entire human genome.

(Laughter) This ignorance affects real life.

In a 2005 medical journal, urologist Dr. Helen O'Connell warned her colleagues that this structure had not yet appeared anywhere in basic medical journals, textbooks like "Grey's Anatomy."

This can have serious implications for surgery.

Please take this in.

Gentlemen: Imagine if you were in danger of losing your penis because your doctor didn't fully understand its location and shape.

Not surprisingly, many women are also less clear about their genital anatomy.

I can't blame them.

Many sexual drawings also often lack the clitoris.

Women feel that their culture views their bodies with confusion at best and outright disdain and disgust at worst.

Many women still consider their genitals dirty or inadequate.

They increasingly compare their vulva to the neat little vulva they see in porn.

This is one reason why labiaplasty is booming among women and teenage girls.

Some people feel that all these things are trivial matters.

When I was writing my book, I was at a dinner party, and someone said, "Isn't sexuality a first world issue?"

Aren't women around the world working on more important issues? ”

Of course it is.

But I think the urge to dwarf sex is part of our problem.

We live in a culture that seems obsessed with sex.

Use it to sell anything.

We tell women that looking sexy is one of the most important things.

But what we really do is disrespect sex.

We reduce it to a sad shadow of what it really is.

Sex is more than just an act.

We spoke with Dr. Lori Blott, a psychologist who treats women's sexual problems, including trauma survivors.

She says the hundreds of women she meets all tend to repeat the same thing.

They say, "I don't feel well."

They feel disconnected from their partner and themselves.

So what is sex?

We have traditionally defined the act of sex as a linear, goal-oriented process.

It begins with lust, continues with intense caresses, and ends with a happy ending.

However, many women do not experience it this way.

For them it is less linear and more circular.

This is a new model of female arousal and desire developed by Dr. Rosemary Basson.

Much has been written, including that women may initiate dating for various reasons other than lust, such as curiosity.

It can end with one or more climaxes, or be satisfied with no climax at all.

All options are fine.

Some are beginning to defend a richer definition of sexuality.

Whether you are male, female, or identify as neither gender, sex is about our relationship with our senses.

It's about slowing down, listening to your body, and being present in the moment.

It concerns our overall health and well-being.

In other words, real sex is not blasphemous, it is sacred.

That's one reason women are redefining their sexuality today.

They ask: what is sex to me?

So they're experimenting with practices that focus on feeling more complete rather than happy endings.

As such, they've experimented with spiritual sex classes, masturbation workshops, and even their own porn shoots that celebrate physical diversity in real life.

For those of you who still feel this is a trivial matter, consider the following. Understanding your own body is crucial to the big issues of sex education and consent.

By knowing deeply and intimately what touch is appropriate, what pressure, what velocity, and in what situations, you will be better able to know what touch feels wrong and be able to say so with confidence.

This doesn't mean that women ultimately have more and better sex.

It does not guarantee that women will have as many orgasms as men.

It's about embracing yourself and your own unique experiences.

You are the expert on your body.

It's about defining joy and contentment in your own words.

And if that means you're happiest not having sex at all, that's perfect too.

If we define sex as part of our overall health and well-being, enabling women and girls to fully own sex is an important next step towards equality.

And I think that would make the world a better place for everyone, not just women.

thank you.

(applause)

Jumbo, Bonjour, Zdravstvuitie, Dayo: These are some of the languages ​​I have spoken bit by bit over the last six weeks. On this crazy tour I'm on, I've probably visited 17 countries to see different aspects of the projects we're doing.

And I'll tell you a little later.

And I have visited two wonderful places: Mongolia, Cambodia, New Guinea, South Africa and Tanzania. i was here a month ago.

And the opportunity to do such a dizzying tour of the world is totally awesome for many reasons.

You will see something incredible.

And you can do these spot comparisons between people all over the world.

And what we really get out of it, the superficial thing, which I will tell you about, is not that we are all one, but rather how different we are.

There is so much diversity in the world.

6,000 different languages ​​spoken by 6.5 billion people, all different colors, shapes and sizes.

Walking the streets or traveling in any big city, you will be amazed at the diversity of humankind.

How would you describe that diversity?

Well, that's what I'm going to talk about today. It's about how we use the tools of genetics, especially population genetics, to figure out how this diversity was generated and how long it took.

Now, the question of human diversity, like all big scientific questions, how do you explain such things? can be divided into subquestions.

And you can hunt down those little subquestions.

The first is precisely the question of origin.

In fact, do we all have a common origin?

And if we do, I think that's an assumption everyone in this room has, when was that?

When were we born as a species?

How long have we been apart from each other?

The second question is related, but slightly different.

If we originated from a common source, how did we inhabit every corner of the earth and in the process give rise to global diversity, different ways of life, different appearances, different languages?

Well, the question of origin, like many other questions in biology, seems to have been answered by Darwin over a century ago.

In The Origins of Man, he writes, "In each great part of the world, modern mammals are closely related to extinct species in the same area.

Therefore, it is likely that Africa was once home to extinct apes, closely related to gorillas and chimpanzees, and since these two species are now our closest allies, it is somewhat more likely that our early ancestors lived on the continent than elsewhere. ”

That's all. Let's go home. The original question is over.

Well, not quite. Because Darwin was talking about our distant ancestors, common ancestry with apes.

And it is clear that the apes originated on the African continent.

About 23 million years ago they appear in the fossil record.

In fact, Africa was cut off from the rest of the continent at the time by the vagaries of plate tectonics floating around the Indian Ocean.

It collided with Eurasia about 16 million years ago, after which the first African Exodus, as we call it, occurred.

The apes that left at that time ended up in Southeast Asia and became gibbons and orangutans.

And what remained of Africa evolved into gorillas, chimpanzees, and us.

Yes, if we are talking about a common ancestor between us and apes, it is very clear that we started here when looking at the fossil record.

But that's not what I'm really asking.

I'm asking about human ancestry, what they would recognize as us if they were sitting in this room.

If they were looking over your shoulder, you wouldn't jump back like that. What happened to our human ancestors?

Because if we go back far enough, we share a common ancestor with all living things on Earth.

Our DNA connects us all, so if we go back over a billion years, we share a common ancestor with barracuda, bacteria and mushrooms.

But what we are asking is the ancestor of the human race.

How do we study it?

Historically, it has been studied using the science of paleoanthropology.

I dug things out of the ground and based mostly on morphology, the shape of things, often the shape of a skull, I thought, "This is a little bit more like us than that, so this must be my ancestor.

This person must be my direct descendant. ”

I would argue that the field of paleoanthropology gives us many interesting possibilities about our ancestry, but not the probabilities we really want as scientists.

What does that mean?

I see a great example here.

These are three extinct species of hominids that are possible ancestors of humans.

All of these were excavated by the Leakey family in the Olduvai Gorge just west of here.

And they all date back to about the same time.

From left to right: Homo erectus, Homo habilis, and Australopithecus (now called Paranthropus boisei, a stout Australopithecus). Three extinct species, same place, same time.

So it's not possible that all three are my direct ancestors.

Who am I actually related to?

There is a possibility regarding our ancestry, but it is not the probability that we are really looking for.

Well, another approach was to look at human morphology using the only data humans actually had until very recently, again mainly skull geometry.

The first to do this systematically was the Swedish botanist Carl von Linnaeus Linnaeus, who in the 18th century set himself up to classify all life on earth.

Think you're doing the hard work?

And he did a pretty good job.

He classified about 12,000 species in "Systema Naturae".

In fact, he coined the term Homo sapiens. It means wise man in Latin.

But looking around the world and looking at human diversity, he said, "Well, we seem to fall into subtle subspecies and categories."

And he spoke of Africans, Americans, Asians, Europeans, and the blatantly racist categories he called "monsters." This includes basically all people he dislikes, including imaginary people like elves.

It's easy to dismiss this as the, perhaps well-intentioned, but ultimately dreamlike speculation of an 18th-century scientist working in the pre-Darwinian era.

However, if you had studied physical anthropology 20 or 30 years ago, in many cases you would have studied basically the same human taxonomy.

According to physical anthropologists 30 or 40 years ago, Carlton Kuhn being the best example, humans diverged from each other for more than a million years - this was the post-Darwin era - since the time of Homo erectus.

But what data is it based on?

Very few. Very few. Morphology and a lot of speculation.

Well, what I'm going to talk about today is a new approach to this problem.

Rather than go out and speculate about our ancestry, dig up possible ancestry out of the ground, and say it based on morphology (which we still don't fully understand, nor do we know the underlying genetic causes of this morphological variation), what we have to do is turn the problem upside down.

Because what we really want is a genealogical problem, or a genealogical problem.

What we're trying to do is build a family tree for everyone alive today.

And any genealogist will tell you - does anyone have a family member or perhaps you've tried to go back in time and build a family tree?

You start in the present with a relationship that you are sure of.

You and your siblings have common parents.

You and your cousin have something in common: grandparents.

Gradually you go back in time and add more and more distant relationships.

But no matter how good you are at digging up church records and such, eventually you'll hit what genealogists call a brick wall.

Beyond that point, nothing else can be known about your ancestors, and you must enter this dark and mysterious realm called history and grope your way, guided by whispers.

Who are the people who came before?

No written record. In fact, we do.

Our DNA, or genetic code, contains historical documents dating back to the earliest days of humankind. And that is what we study.

Well, here's a quick primer on DNA.

I suspect that not everyone in the audience is a geneticist.

This is a very long linear molecule that encodes how to create another copy of you. It's your blueprint.

It consists of four subunits: called A, C, G and T.

And it's the array of those subunits that defines that blueprint.

how long is it? Well, these subunits are billions in length.

The haploid genome - we actually have two copies of every chromosome - the haploid genome is about 3.2 billion nucleotides in length.

And all together, they are over 6 billion nucleotides long.

If you took all the DNA from one cell in your body and stretched it end to end, it would be about 2 meters long.

If you took all the DNA from every cell in your body and stretched it from end to end, you would make thousands of round trips from here to the moon. That's a lot of information.

Therefore, when trying to copy and pass on this DNA molecule, it becomes a rather difficult task.

Imagine the longest book you can think of, War and Peace.

Now multiply it by 100.

And imagine copying it by hand.

And you work late into the night, you're very observant, you're paying attention over your coffee, but every now and then, as you're copying this by hand, you end up making small typos and spelling mistakes. That means replacing E with I, or T with C, and so on.

The same thing happens in our DNA and is passed down from generation to generation.

That doesn't happen often. It has a built-in calibration mechanism.

But when it does happen, and these changes are passed down through generations, they become landmarks for offspring.

When you share a marker with someone, it means that you share an ancestor at some point in the past, the person who first made that change in your DNA.

And by looking at the patterns of genetic mutations in people around the world and the patterns of these markers, and assessing the relative ages at which they occurred throughout our history, we were able to build a family tree for everyone alive today.

These are two pieces of DNA that we use very extensively in our work.

Mitochondrial DNA tracing purely maternal lineages.

You receive mtDNA from your mother, and your mother's mother, all the way to the first female.

The Y chromosome, the part of the DNA that makes a man male, traces a purely paternal lineage.

Everyone in this room, everyone in the world, fits into some lineage of this tree.

Now, these are simplified versions of real trees, but they're still somewhat complicated, so let's simplify them.

Lay them on their side and combine them to look like a tree with roots at the bottom and branches rising up.

What's your takeaway message?

The first thing that strikes us is that the deepest ancestry in our family tree is found within Africa, among Africans.

It means that Africans have accumulated this mutational diversity over a long period of time.

What that means is that we are of African origin. It's in our DNA.

All the DNA we observe is more diverse within Africa than outside it.

And at some point in the past, some groups of Africans left the African continent and migrated and settled in other parts of the world.

Now, how recently did we come to share this ancestry?

Seeing this incredible change around the world, was it millions of years ago?

No, DNA tells a very clear story.

In the last 200,000 years, we all share a single person living in Africa: Mitochondrial Eve. Mitochondrial Eve is the African woman who created all the mitochondrial diversity in the world today.

But what's even more amazing is that if you look at the Y chromosome side, the male side of the story, Y-chromosome Adam lived just about 60,000 years ago.

That's only about 2,000 generations of humans, and from an evolutionary point of view, it's just the blink of an eye.

It speaks to us all still living in Africa at the time.

This African man created all the Y-chromosome diversity in the world.

It is only within the last 60,000 years that we have begun to produce this amazing diversity that we see around the world.

It's such a great story.

We are all virtually part of one big African family.

Well, it seems so recent. Why didn't you start leaving earlier?

Why didn't Homo erectus evolve into another species, or rather subspecies, around the world?

Why do we look like we just came out of Africa?

Well, that's a big question. These "why" questions have always been big questions, especially in genetics and historical research in general, and difficult to answer.

So when all else goes wrong, talk about the weather.

What happened to the world's weather about 60,000 years ago?

Well, we were entering the worst of the last Ice Age.

The last ice age began about 120,000 years ago.

Repeatedly rising and falling, it began to accelerate in earnest about 70,000 years ago.

A lot of evidence comes from sediment cores, pollen types, oxygen isotopes, etc.

We reached the last glacial maximum about 16,000 years ago, but basically from 70,000 onwards, things got really bad and very cold. A huge ice sheet was growing in the northern hemisphere.

New York City, Chicago, Seattle, all under the ice.

Most of Britain and all of Scandinavia are covered by ice several kilometers thick.

Africa is now the most tropical continent on earth, with about 85% of it lying between the constellations Cancer and Capricorn, and except for the high mountains here in East Africa, there are not many glaciers here.

So what was going on here? No ice covered in Africa.

Africa was rather dry at that time.

Here is a paleoclimate map of Africa 60,000 to 70,000 years ago, reconstructed from all the evidence mentioned earlier.

The reason is that ice actually absorbs moisture from the atmosphere.

If you think about Antarctica, it's technically a desert, with very little precipitation.

So the whole world was drying up.

Sea level was falling. And Africa was turning into a desert.

The Sahara Desert in those days was much larger than it is today.

And human habitats have shrunk to just a few tiny pockets compared to what they are today.

Evidence from genetic data suggests that the human population plummeted to less than 2,000 at this time, about 70,000 years ago.

We are almost extinct. We were clinging with our nails.

Then something happened. A great illustration for that.

See some stone tools.

The one on the left is from Africa about 1 million years ago.

The one on the right was made by Neanderthals, our distant relatives rather than our direct ancestors living in Europe, and is about 50,000 or 60,000 years old.

Now, at the risk of angering paleoanthropologists and physical anthropologists in the audience, basically there is not much change between these two stone tool groups.

The one on the left is very similar to the one on the right.

We are in a long period of cultural stagnation from 1 million years ago to about 60,000 to 70,000 years ago.

The style of the tools doesn't change much.

The proof is that human life hasn't changed that much even in this era.

But 50,000, 60,000, 70,000 years ago, somewhere in that region, all hell broke loose. Art appears.

Stone tools are made more elaborately.

The evidence is that humans begin to specialize in certain prey species at certain times of the year.

The population size began to grow.

Perhaps, according to many linguists, it was around that time that a fully modern language, a syntactic language of subjects, verbs and objects, emerged that we use to communicate complex ideas as we do today.

We are more social. The social network has expanded.

This change in behavior has allowed us to weather the deteriorating situation in Africa and begin to expand our operations around the world.

We have been talking about African success stories at this conference.

Well, do you want the ultimate African success story?

look in the mirror It's you You are alive today because of changes in our brains that happened in Africa. Probably somewhere in the region where we are sitting now, about 60,000, 70,000 years ago. This has allowed us to not only survive in Africa, but also expand outside of Africa.

Early coastal migration along the southern coast of Asia left Africa about 60,000 years ago and very rapidly reached Australia by 50,000 years ago.

I emigrated to the Middle East a little later.

They would have been savannah hunters.

So those who take the post-conference tour will get an idea of ​​what the real Savannah is like.

And it's basically a meat locker.

About 45,000 years ago, during the rare wet season in the Sahara Desert, people who would have hunted animals in the meat-locker savannas, followed the grasslands into the Middle East, and specialized in killing animals.

They migrate east along the steppes because they are adapted to live.

And when they reached Central Asia, they practically reached the steppe super-highway, the steppe super-highway.

At that time, the grasslands of the Last Ice Age basically stretched from Germany to Korea, and the entire continent was open to grasslands.

Entering Europe about 35,000 years ago, and finally through Siberia, inside the Arctic Circle of the last ice age, in the worst weather imaginable, in temperatures of -70, -80, and sometimes -100, a small group migrated to the Americas, eventually reaching the final frontier.

Amazing story, but it first happened in Africa.

The changes that made it possible have allowed us to create new cultures, to develop the diversity we see on whirlwind journeys like the one I just took, with the evolution of this adaptive brain that we all carry with us.

Well, that story I just told you is literally a dizzying tour of how we populated the world: the great Paleolithic wanderings of our species.

That's the story I told a few years ago in my book, The Journey of Man, and the movie we made with the same title.

And when I was finishing the movie that I co-produced with National Geographic, I started talking to people at NG about it.

And they were so excited about it. They liked the movie, but they said, “You know, we really think of this as something like the next wave in the study of human origins, where we all came from, using the tools of DNA to map migration around the world.

As you know, the study of human origins is like our DNA and we want to take it to the next level.

What do you want next? ”

This is a great question for National Geographic to ask.

And I said, 'Well, that's exactly what I drew here.

This is a very rough sketch of how we moved on Earth.

And it's based on thousands of people sampled from a few populations around the world.

After studying several genetic markers, we found many gaps in this map.

It's just connecting the dots. What we need to do is increase the sample size by more than an order of magnitude, hundreds of thousands of DNA samples taken from people around the world. ”

That was the beginning of the Genographic Project.

This project started in April 2005.

It has three core components. Obviously, science is a big part of that.

The field research we do with indigenous peoples around the world.

People who live in the same place for long periods of time retain a connection to their place that many others have lost.

So my ancestors came from all over the Nordic countries.

When I'm not traveling, I live on the East Coast of North America.

Where am I from? really nowhere. My genes are all jumbled up.

However, there are people who retain ancestral ties that allow us to contextualize DNA results.

This is the focus of our field research and the centers we have established around the world, 10 of which are top population geneticists.

But in addition, we wanted to make this research available to anyone in the world.

How often do you get the chance to participate in large scientific projects?

The Human Genome Project, or a Mars rover mission.

In this case it is actually possible.

Visit our website Nationalgeographic.com/genographic.

You can order a kit. You can test your own DNA.

And you can actually send those results to a database, tell them a little bit about your genealogical background, and have them analyze the data as part of a scientific effort.

Now, since this is all a non-profit company, the funds we raise will be poured back into the project after covering the cost of conducting tests and building the components of the kit.

Most of it goes to what are called legacy funds.

It's a charity, basically a grant giving back fund for educational and cultural projects initiated by indigenous groups around the world.

They apply to this fund to do various projects. Here are some examples.

So how's the project going? We're collecting about 25,000 samples from indigenous peoples around the world.

The most surprising thing is the public interest. Since launching the service two years ago, 210,000 people have ordered these participation kits, raising nearly $5 million. Most of it, at least half, will be donated to the Legacy Fund.

We have just awarded our first Legacy Grants totaling approximately $500,000.

Projects around the world - recording oral poetry in Sierra Leone, preserving traditional weaving patterns in Gaza, revitalizing languages ​​in Tajikistan, etc.

The project is progressing very well. Please check the website to see this space.

thank you very much.

(applause)

Even after decades of research and billions of dollars spent in clinical trials, cancer drug administration remains problematic.

We still give our patients chemotherapy, but it's so non-specific that even if it kills the cancer cells, it's like killing the rest of the body.

Indeed, we have developed more selective drugs, but they are still difficult to deliver to the tumor and eventually either accumulate in other organs or pass through the urine and are completely wasted.

And fields like mine have emerged that try to encapsulate these drugs in order to protect them as they move through the body.

But these changes cause problems, so I'll make some more changes to fix them.

So what I really want to say is we need better drug delivery systems.

So instead of using only human design, why not use nature's design?

Immune cells are versatile vehicles that travel throughout our bodies, patrolling for signs of disease and arriving at wounds just minutes after injury.

So I ask you all. If immune cells have already migrated to the site of injury or disease in our bodies, why not add another passenger?

Why not use immune cells to deliver medicine to treat some of the biggest problems in disease?

I am a biomedical engineer and I would like to talk about how immune cells can be used for one of the biggest cancer problems.

Did you know that more than 90% of cancer deaths are due to cancer metastasis?

Therefore, if we can stop these cancer cells from migrating away from the primary tumor, we can stop the cancer in progress and give people back more lives.

To accomplish this special mission, we decided to provide nanoparticles made of lipids, the same substances that make up cell membranes.

And added two special molecules.

One, called e-selectin, acts as a glue that binds the nanoparticles to immune cells.

And the second one is called Trail.

Trahl kills cancer cells, but not normal cells.

Combine both and you have a dastardly killing machine on wheels.

To test this, we performed experiments on mice.

So what we did was we injected the nanoparticles and they bound almost immediately to the immune cells in the bloodstream.

They then injected cancer cells to mimic the process by which cancer cells spread throughout the body.

And I found something very interesting.

In our treatment group, we found that more than 75 percent of the cancer cells that were initially injected died or died, compared to only about 25 percent.

Please try to imagine. These smaller amounts of cells can actually spread to other parts of the body.

And this is after just 2 hours of treatment.

Our results were excellent and we had some very interesting press.

Actually my favorite title was "sticky balls may stop the spread of cancer".

(Laughter) I can't tell you how smug my male colleagues were when they learned that their sticky balls might one day cure cancer.

(Laughter) But I can say that they made a very cute, exciting, and pretty bold t-shirt.

Also, this was my first experience talking to a patient about how soon our treatment will be available.

And I always carry these stories with me as a reminder of the importance of science, scientists and patients.

Now, while our fast-acting results were very intriguing, we still had one question: Can our sticky balls, or particles actually attached to immune cells, actually stop the spread of cancer?

So when we looked at animal models, we found three key parts.

Treated animals had smaller primary tumors, fewer circulating cells, and little or no tumor burden in distant organs.

Now, this wasn't just a win for us and the sticky balls.

This is also a victory for me in drug delivery, which represents a paradigm shift, a revolution. From simply taking a drug, injecting it, and hoping it gets to the right place in the body, using immune cells as special delivery drivers in the body.

In this example, we used two molecules, e-selectin and TRAIL, but in reality, the possibilities of possible drugs are endless.

We talked about cancer, but if the disease progresses, so do immune cells.

Therefore, it can be used for any disease.

Imagine using immune cells to deliver vital wound healing agents after a spinal cord injury, or using immune cells to deliver drugs across the blood-brain barrier to treat Parkinson's or Alzheimer's disease.

These are the ideas that excite me the most when it comes to science.

And from my point of view, I see many possibilities and opportunities.

thank you.

(applause)

I can't think of anyone who has only one interest in life and wants to do it for the rest of their lives.

[How we work] About 15 percent of American workers are not in traditional full-time jobs.

They are half-time, part-time, contract, or temporary workers.

The term "side hustle" seems fitting for this ethos of people combining several different things to make a living.

The roots of the term "side hustle" are in a popular African-American newspaper.

In the 1920s, these newspapers used the term "hustle" to describe a type of fraud.

By the 1950s, the term "side hustle" was also used to refer to legal work.

A side job is a little different than a side job.

A side business is essential.

A side hustle certainly brings in extra income, but it's a little more ambitious.

Side hustle represents a kind of finicky entrepreneurial spirit.

I've interviewed over 100 women of color who have successfully started side hustle with Side Hustle Pro.

Naira Ellis Brown started drinking Ellis Island tea from the trunk.

Arsha Jones started Capital City Co Mambo Sauce, famous for one product and PayPal link.

These women all have side jobs.

What exactly does this tell us?

First, people are seeing opportunities within the community.

The goal here isn't necessarily to be the next Coca-Cola or Google.

Scale is great, but there is also beauty in a successful business built for a specific audience.

Second, people are more and more interested in being the boss themselves.

Being your own boss requires discipline.

Self-made millionaires tend to have one big thing in common. It's about making decisions, taking responsibility, and pushing through in the face of challenges.

A side hustle is a great way to try being your own boss and see if you have the skills to do so before going completely on your own.

Third, people have multifaceted passions.

I want to stress that not all side hustles start because someone hates their job.

Many are started simply because people are interested in different things.

Lisa Price, who founded Carol's Daughter, a barber and beauty company, was working in television production when she started her side business.

She says she really loved her job.

The fact that she came home feeling good every day was what inspired her to experiment with creating fragrances and hair oils in the kitchen.

We've always been taught that we need to know what we want to do when we grow up.

However, if you have a lot of passion, you will want to immerse yourself in various things and try your hand at it.

That doesn't mean you're not passionate about your work, it's just that you have another outlet that brings you joy.

And the last thing The Sideline Revolution has shown us is that people want to bet on themselves.

The appeal of a side business is that it is easy to seize the opportunity when some kind of income comes in.

Even if your side hustle doesn't take off, it's still an investment in yourself.

41% of millennials with side jobs say they have shared this information with their employers.

They don't worry about managers reacting negatively.

They recognize all the learning and growth that comes with running a side business.

Everyone wants fulfillment.

38 percent of baby boomers have some regrets about their careers.

nobody wants that.

The truth is that there are many different ways to find happiness through our actions.

A side hustle is embracing the hope of being in control of how you spend your working life.

Let's start with some great photos.

This is an Afghan refugee photographed by National Geographic icon Steve McCurry.

But it's horrifying to think that Harvard Lampoon is about to run a National Geographic parody and what they're going to do with this photo.

Ah, the wrath of Photoshop.

This is a jet plane landing in San Francisco as drawn by Bruce Dale.

He attached a camera to the tail.

A poetic image of Tolstoy's story by Sam Abel.

Pygmies of the Democratic Republic of the Congo by Randy Olson.

i love this photo Because it reminds me of Degas' bronze sculpture of a little dancer.

Polar bear swimming in the Arctic, by Paul Nicklen.

Polar bears are not very good swimmers, so they need ice to move back and forth, but we know what happens to ice.

These are camels moving through the Great Rift Valley in Africa, photographed by Chris Johns.

I shot it from directly below, so it's a camel's shadow.

This is a Texas rancher painted by the great portraitist William Albert Allard.

and Jane Goodall making her own special connection, photographed by Nick Nichols.

This is a Spanish soap disco filmed by David Allan Harvey.

And David said there were a lot of weird things going on on the dance floor.

But hey, at least it's hygienic.

(Laughter) These are Australian sea lions doing their own dance. By David Deville.

This is a comet captured by Dr. Ewan Mason.

And finally, the bow of the Titanic without the movie stars photographed by Emory Christophe.

Photography has the power to withstand the unrelenting vortex of today's saturated media world. Because photography mimics the way our minds freeze important moments.

Here is an example.

Four years ago, I was at the beach with my son learning to swim in this relatively calm wave in Delaware.

But when I turned my back for a moment, he was caught in a torrent and began to be dragged towards the pier.

As I stand here now, following him into the water, I can see the moment slowing down and solidifying into this arrangement.

I can see a rock here.

The waves are crashing on him.

I can see him holding out his hand, and I can see him looking at me with a look of terror and saying, "Dad, help me."

I got him Waves crashed over us.

We returned to shore. he was fine

We were a little rattled.

But this Flashbulb memory is, as the name suggests, of when all the pieces came together to define not just the event, but my emotional connection to it.

And this is what photography is used to when it creates a powerful connection with the viewer on its own.

I have to say here, I was talking to Kyle about this last week and thought I'd bring this up.

And he said, "Oh yeah, I remember that too!"

I remember your image of me was screaming at me on the shore. ”

(laughs) I thought of myself as a hero.

(Laughter) So this is a cross-sample of some of the most remarkable images taken by some of the world's greatest photojournalists, working at the pinnacle of their craft, but one.

This photo was taken last year by Dr. Ewan Mason from New Zealand and was posted and published in National Geographic.

Last year we added a section to our website called 'Your Shot' where anyone can submit photos for publication.

And it tapped into the community of photography enthusiasts to great success.

The quality of these amateur photos can be astonishing in some cases.

As you can see, we all have at least one or two great photos.

But to be a good photojournalist, you need to have more than one or two great photos inside of you.

You have to be able to make it anytime.

But more importantly, you need to know how to create visual narratives.

You have to know how to tell a story.

So here are some coverage that I feel demonstrate the storytelling power of photography.

Photographer Nick Nichols went to document a very small and relatively unknown wildlife sanctuary in Chad called Zakouma.

The original purpose was to travel there and bring back classic stories of diverse species in exotic locations.

And that's what Nick did up to a point.

This is a serval cat.

He actually takes pictures of himself, and they are filmed with something called a camera trap.

There was an infrared beam, and he stepped into the beam and took a picture.

These are the baboons at the water fountain.

Nick -- I've taken thousands of photos with cameras, also automated cameras.

And Nick ended up taking lots of pictures of the baboons' butts.

(Laughter) A lion having a midnight snack -- I just noticed a broken tooth.

The crocodile then walks along the riverbank towards the burrow.

I love this little water coming out of the back of my tail.

But the centerpiece of Zakouma is the elephant.

It is one of the largest pristine herds in this part of Africa.

This is a photo taken under the moonlight. Digital photography has made a big difference.

The elephant is central to this story.

Nick, along with researcher Dr. Michael Faye, collared the herd's matriarch.

They named her Annie and began tracking her movements.

The herd was safe within the confines of the park, thanks to this dedicated group of park rangers.

However, when the rains start to fall, like every year, the flocks start moving to feeding grounds outside the park.

And then they ran into a problem.

Because outside the safe parks there are poachers who hunt them down solely for the value of their ivory.

The patriarch they were radio-tracking stopped outside the park after being in and out of the park for weeks.

Annie was killed along with 20 members of the herd.

And they came for only ivory.

Actually, this person is also one of the rangers.

They were able to get rid of one of the poachers and recover this ivory. This was because the precious ivory could not be left alone.

But what Nick has done is bring back a story that goes beyond the old-fashioned way of simply saying, "This is a wonderful world, isn't it?"

Instead, they created stories that resonated deeply with their audience.

He created not only knowledge about the park, but an understanding and empathy for the many issues surrounding elephants, rangers, and human-wildlife conflicts.

Now let's go to India.

In some cases, you can tell a broad story in a focused way.

We were looking at the same issues that Richard Wurman touches upon in his new world population project.

For the first time in history, more people live in urban rather than rural settings.

And most of that growth isn't happening in cities, but in the slums around them.

Jonas Bendiksen, a very energetic photographer, came to me and said, "This should be documented. Here is my suggestion.

Go around the world and photograph all the slums of the world. ”

And I said, "Well, that might be a little ambitious for our budget."

So what we did instead, instead of going out and doing some sort of investigation, going in and seeing a little bit of everything, we decided to take Jonas to Dharavi, part of Mumbai, India, and let him stay there and really get into the heart and soul of this really major part of the city.

What Jonas did was not merely a superficial observation of the terrible conditions that existed in such places.

He recognized that this was a living breath and an important part of how the entire urban area works.

Jonas brought out the underlying soul and enduring human spirit of this community by keeping it firmly in one place.

And he did it in a beautiful way.

But sometimes the only way to tell a story is with overarching images.

We teamed up with underwater photographer Brian Skerry and photojournalist Randy Olson to document the decline of global fisheries.

We weren't the only ones to tackle this subject, but the images Brian and Randy created are among the best at capturing both the human and natural destruction of overfishing.

In Brian's photo, a seemingly crucified shark is caught in a gill net off the coast of Baja.

I've seen OK pictures of bycatch, but accidentally scooping up animals while fishing for certain species.

But here, Brian captured a unique view by placing himself under the boat as it threw the waste overboard.

And Brian took an even bigger risk to capture never-before-seen photos of trawl nets scraping the ocean floor.

Back on land, Randy Olson photographed a makeshift fish market in Africa. The remains of the filleted fish were sold to the local population, and the main parts had already been sent to Europe.

And here in China, Randy photographed a jellyfish market.

As the primary food source is depleted, crops reach deeper into the ocean, providing more sources of protein.

This is called food chain fishing.

But there is a silver lining, and whenever we have a big, big story on this issue, I don't think we want to go and just look at all the issues.

We would also like to find a solution.

Brian photographed a New Zealand marine reserve where commercial fishing was prohibited. As a result, overfished species can recover and provide a sustainable fisheries solution.

Photography can also force us to face potentially distressing and potentially controversial issues.

Last year's TED honoree, James Nachtwey, looked at the broader picture of the medical system being used to care for wounded Americans coming out of Iraq.

It's like a tube that a wounded soldier enters at one end and exits at the other end back home.

Jim left the battlefield.

Here, a medical technician treats a wounded soldier in a helicopter returning to a field hospital.

This is a field hospital.

The soldier on the right has his daughter's name tattooed on his chest as a reminder of his hometown.

From here, the seriously injured are transported to Germany, where they are reunited with their families for the first time.

Then you go back to the US and recuperate at a veterans hospital like here at Walter Reed.

And finally, often with high-tech prosthetics, they try to escape the medical system and reclaim their pre-war lives.

Jim gave a story that could be a straight-up medical story a human side that deeply moved the reader.

Well, these stories are great examples of how photography can be used to address some of our most important topics.

But sometimes photographers come across things that are just plain fun after all.

Photographer Paul Nicklin traveled to Antarctica to capture a story about leopard seals.

They are rarely photographed as they are considered one of the most dangerous predators in the ocean.

In fact, a year earlier, a researcher had been grabbed and dragged deep into the depths to his death.

So you can imagine that Paul was a little hesitant to get in the water.

Now, the main activity of leopard seals is to eat penguins.

Do you know "Penguin March"?

This is like penguin snacks.

(Laughter) Here the penguins go to the edge to see if the beach is clean.

Then everyone starts running and goes outside.

But Paul ended up in the water.

And he said he never really feared this.

Now this one woman came to him.

She's probably 12 feet long, although you probably can't see it in the picture.

Therefore, her size is quite large.

And Paul said she was never really scared because she was more interested in him than being threatened.

This mouth movement on the right was exactly how she was saying to him, "Hey, look how big I am!"

Or you might think, "What big teeth you have!"

(Laughter.) And Paul thinks she just took pity on him.

To her, here is this big, goofy creature in the water that for some reason didn't seem interested in chasing penguins.

So she brought the penguin alive to him and began to put it in front of him.

She let them down and they swam away.

She looked at him like, "What are you doing?"

Go back and get them, bring them back and put them in front of him.

And she repeated this over several days until she got so annoyed with him that she started putting them directly on his head.

(Laughs) It turned out to be a great photo.

(Laughter.) But at the end of the day, I think Paul thought she would never survive.

Here she is just puffing up and snorting in disgust.

(Laughter.) Then I lost interest in him and went back to what she did best.

Paul set out to photograph relatively mysterious and obscure creatures and came back with more than just a book of photographs, but an amazing experience and a great story.

It's these kinds of stories—beyond the direct and superficial—that demonstrate the power of photojournalism.

I believe photography can create genuine connections with people and can be used as a positive means of understanding the challenges and opportunities facing our world today.

thank you.

(applause)

I would like to dedicate the next song to Carmelo, who was put to sleep a few days ago due to his advanced age.

However, it seems that he was a very kind dog, and he always let the cat sleep on the dog bed.

♫ (Dog moans) Heh, heh, heh, heh, heh, heh, heh, heh, heh, heh. ♫ ♫ I'm just walking the dog, singing and taking walks. ♫ ♫ Yes, just me and my dog ​​are sunbathing. You can't go wrong. ♫ ♫ My life was lonely and blue. ♫ ♫ Yes, I was sad as a sailor, ♫ ♫ I was angry too. ♫ ♫ And there you were - appeared when I was young and frightened, ♫ ♫ Nerves jingling, vermouth and beer messing me up. ♫ ♫ But I saw your eyes ♫ ♫ And I was no longer a failure. ♫ ♫ You looked so quirky and clever. ♫ ♫ And I said, "Lord, I'm happy because I'm just walking the dog. ♫ ♫ I'm in the sun. We're right." ♫ ♫ Because I don't care about your hatred or your suspicions, ♫ ♫ And I don't care what politicians spew. ♫ ♫ If you need a companion, just go to the pound, ♫ ♫ be a hound yourself and make that dog proud, ♫ ♫ because that's what it's all about. ♫ ♫ (Dog moans) Heh, heh, heh, heh, heh, heh, heh, heh, heh, heh. ♫ ♫ My life was tragic and sad. ♫ ♫ I was the prototypical loser. ♫ ♫ I was a failed pageant. ♫ ♫ And you were right on time, wagging your tail ♫ ♫ In a cute prison mime. ♫ ♫ I said, "Oh, be mine!" And you cried, ♫ ♫ I was no longer alone. ♫ ♫ And I was no longer a drinker. ♫ ♫ We build the happiest homes. ♫ ♫ And I said, "Lord, I'm happy because I'm just walking my dog. ♫ ♫ I'm just walking singing my song." ♫ ♫ Yes, only me and my dog ​​are sunbathing. Don't get us wrong, ♫ ♫ Because I don't care about your hatred or suspicion, ♫ ♫ And I don't care what politicians spew. ♫ ♫ If you need a companion, just go out to the pound, ♫ ♫ And make yourself a hound and be proud of it, ♫ ♫ 'Cause that's all, ♫ ♫ That's all, ♫ ♫ That's all, BOW-WOW-WOW-WOW ♫ ♫ That's all. ♫ ♫ (Dog moaning) Heh, heh, heh, heh, heh. ♫ What a nice dog!

thank you.

I was about eight years old when I first heard about something called climate change or global warming.

It seems that it was created by the way humans lived.

We were told to turn off the lights to save energy and recycle paper to save resources.

I remember thinking it was very strange that humans, as an animal species in particular, could change the Earth's climate.

Because if we did, and if it really happened, we wouldn't be talking about anything else.

As soon as you turn on the TV, everything is about it.

You never read or hear headlines, radio, newspapers, as if there was a world war going on.

But no one talked about it.

If burning fossil fuels is so bad that it threatens our very existence, how can we continue as before?

Why were there no limits?

Why was it not made illegal?

For me it was unconvincing.

It was too surreal.

So when I was 11 years old, I got sick.

I became depressed, stopped talking and stopped eating.

I lost 10 kg in 2 months.

Later I was diagnosed with Asperger Syndrome, OCD and Selective Mutism.

It basically means that I speak only when I think it is necessary. Now is one of those moments.

(Applause.) Almost everything is black or white for those of us on the spectrum.

We're not very good at lying, so we usually don't like participating in this social game that other people seem to like very much.

(Laughter) In many ways, I think we are normal with autism and the rest of us are pretty weird.

I don't understand it. Because if you have to stop the emission, you have to stop the emission.

For me it's white or black.

There are no gray areas when it comes to survival.

Either we survive as a civilization or we don't.

we have to change.

A rich country like Sweden should start reducing emissions by at least 15% each year.

And that's to keep the global warming target below 2 degrees.

However, as the IPCC recently demonstrated, aiming for 1.5 degrees Celsius instead would have significantly less impact on the climate.

But we can only imagine what that means for emissions reductions.

You would think the media and our leaders wouldn't talk about anything else, but they never mention it.

Nor does anyone mention the greenhouse gases already trapped within the system.

And since air pollution doesn't mask warming, it means that if we stopped burning fossil fuels, we'd already have an additional level of warming, probably around 0.5 to 1.1 degrees Celsius.

Furthermore, few people talk about the fact that we are in the middle of the 6th mass extinction, with up to 200 species dying out every day, and that the extinction rate today is 1,000 to 10,000 times higher than what is thought to be normal.

And few talk about the fairness and climate justice aspects that are spelled out throughout the Paris Agreement, which are absolutely necessary for it to work globally.

This means that rich countries will need to reach zero emissions within 6-12 years at current rates of emissions.

By building some of the infrastructure we have already built – roads, schools, hospitals, clean drinking water and electricity – so that people in poor countries have the opportunity to improve their living standards.

Because how can we expect countries like India and Nigeria to care about the climate crisis when we, who already have it all, don't care for a second about the climate crisis or the actual commitments to the Paris Agreement?

So why don't we cut our emissions?

In fact, why are they still increasing?

Are we deliberately causing mass extinctions?

are we evil?

No, of course not.

People stay in their current jobs because the vast majority of people have no idea of ​​the real impact of their daily lives, nor of the need for rapid change.

We all think we know, we all think we know, but we really don't.

I mean, how can you do that?

If there really is a crisis, and if this crisis is caused by our emissions, we will see at least some indications.

It's not just flooded cities, tens of thousands of dead, and entire nations turned into piles of demolished buildings.

You will see some limitations.

But it's not.

and no one talks about it.

No emergency meetings, no headlines, no breaking news.

No one is acting as if we are in crisis.

Even most climatologists and eco-friendly politicians fly around the world eating meat and dairy.

If I live to be 100 years old, I will be living in 2103.

When we think about the future now, we can't think of anything beyond 2050.

By then, I won't be living half my life at best.

what happens next?

In 2078, I will celebrate my 75th birthday.

If I had children or grandchildren, perhaps they would spend the day with me.

Maybe they ask me about you and the people around you in 2018.

Perhaps they will ask why you didn't do anything when you still had time to act.

What we do or don't do now will affect my entire life and the lives of my children and grandchildren.

What we do or don't do now can't be undone in the future by me or my generation.

So when school started in August of this year, I decided that this was enough.

I prostrated myself on the ground outside the Swedish parliament.

I went on strike at school for climate change.

Some say you should go to school instead.

Some say you should study to be a climate scientist in order to "solve the climate crisis."

But the climate crisis is already resolved.

We already know all the facts and solutions.

All we have to do is wake up and change.

And if no one is doing anything to save that future, why should we study for our impending future?

And what is the point of learning facts in the school system when the most important facts given by the best science of the same school system obviously mean nothing to politicians and society?

Some people say that Sweden is just a small country and it doesn't matter what we do, but imagine what all of us could do if a few kids didn't come to school for a few weeks and it made headlines around the world.

(Applause) Well, I'm almost at the end of my talk. Here people usually start talking about hope, solar panels, wind power, circular economy, etc, but I'm not going to do that.

For 30 years, we've encouraged and sold forward-thinking ideas.

And sorry, it doesn't work.

Because if we could do that, emissions would have decreased by now.

they are not.

And yes, we need hope, of course we need it.

But what we need more than hope is action.

Hope is everywhere if we start to act.

So don't look for hope, look for action.

Then, and only then, hope comes.

Today we use 100 million barrels of oil every day.

No politics can change that.

There is no rule to keep the oil in the ground.

Therefore, we cannot save the world just by following the rules. Because the rules have to change.

everything needs to change. And it must start today.

thank you.

(applause)

People often ask me why I do art, what I want to say with my art photography, and what it can do for me.

Like medicine and technology, we can see and calculate results, so sometimes we worry about how we can actually measure the impact from art.

Then I will finally be able to explain my art to my mother in real numbers.

But my art is far from scale, and my photography broadly exposes the theme of escapism.

My theory is that we all struggle to escape from time to time in order to analyze, perceive, and change our reality.

I'm not dealing with everyday life as it is, nor am I a conventional documentary photographer.

But I am a documentary photographer in a different way.

Record your dreams

I handle everyday life as it is, as I envisioned it.

I'm a daydreamer, but at the same time I love things that are real and that deal with the deepest human nature that never wants to escape.

I admire complex personalities and draw inspiration from real life to create images.

Real life encourages us to escape, and sometimes that escape is sorely needed.

I believe that heroes are not born lightly. And I chose to work with people who are survivors, who are faced with a not always colorful life, who are on their way to a better life while struggling with their living circumstances.

Why would you choose such a person as a model?

Because I myself was in that position when I had to learn how to survive in the real world.

I was a student studying in London.

I was working as a waitress in two places at the same time.

Of course, it wasn't my dream job, but I decided to play the game of imagining being in a role in a movie. In the movie I am a waitress and I have to act great.

I dyed my hair and eyebrows gingerlet, changed my hair to a curly perm, lost weight, and made myself believe that I was just the character I was playing in the movie.

It's not forever, it's all temporary.

It was very helpful.

It changed my life and motivated me to work hard as a game.

Now, as an artist, I create different lives for my models in order to give them the experience of being a different person in real life.

Through the photographic process, all my models become like actors in silent films.

They are caught in a moment where they believe they are completely different people.

To holistically create a new reality, I physically create everything in my work, sometimes from the costumes to the stage.

I work analogue and don't do any digital processing to my photos, so everything has to be done in real life, even though almost everything can be done digitally today.

I don't like this road

I find beauty in authenticity, even when it reaches perfection, but without imperfections it is impossible.

Digitally processed photos are not real to me.

It captures nothing of reality.

No experience, no motivation.

It's like looking at someone else's travel photos instead of going on a trip.

What I find very exciting is the ability to make people's dreams of being others a reality.

It's like a drug that encourages you to keep working without indicators.

One of my models has always dreamed of being seen as a warrior, but was unable to play sports due to health problems.

Six months ago, she died of heart disease at the young age of 22.

But two days before she died, Vogue magazine published a photo of her as the warrior she dreamed of, which we had worked on for months, at a major exhibition in Milan.

Her life was all about getting over it.

Before she died, she knew that thousands of people had seen her from the land of escapism and believed in her as a brave and fearless warrior.

In my job, I encourage people to play games pretending to be someone else when we were kids, and the process made us really happy.

I think it's important for adults.

To do this in the name of art requires such a transformation.

It gives us a very real sense of being important and powerful to influence our reality.

I know this from my own personal experience.

Through my self-portraits, I have become many different characters, so I have brought many versions of myself.

Being a stranger in escapism doesn't give you an exact measurable number, but it's a kind of lost magic that exists but can't be measured.

Art has the unique power to transform and push our limits.

Art creates what I call 'a life evoked' that helps us exist, express ourselves without measure or calculation, encourages us to stay, motivates and inspires us.

thank you.

(applause)

As a particle physicist, I study elementary particles and how they interact at their most basic level.

Most of my research career has been working with accelerators, such as the electron accelerator at Stanford University in front of me, to do things on the smallest scale.

But these days, I'm turning my attention to the universe at its largest scale.

Because, as we'll see, the smallest and largest questions are actually very related.

So I'm going to talk about the 21st century view of the universe, what the universe is made of, and what are the big questions in the physical sciences, at least some of the big questions.

So, recently we realized that ordinary matter in the universe, or ordinary matter, refers to you, me, planets, stars, and galaxies, but ordinary matter occupies only a few percent of the content of the universe.

Almost a quarter of the matter in the universe, or about a quarter, is invisible matter.

Invisible means not absorbing the electromagnetic spectrum.

It does not emit in the electromagnetic spectrum. It's not reflected.

It does not interact with the electromagnetic spectrum we use to detect objects.

No interaction at all. So how do we know it's there?

We know it's there due to the effects of gravity.

In fact, this dark matter largely dominates the gravitational influence of the universe, and we'll talk about the evidence for that.

What about the rest of the pie?

The rest of Pie is a very mysterious substance called dark energy.

More on that later.

So for now, let's turn to the evidence for dark matter.

In these galaxies, especially spiral galaxies like this one, most of the stellar mass is concentrated in the center of the galaxy.

The enormous mass of all these stars keeps them in circular orbits within the galaxy.

So these stars are going around in circles like this.

As you can imagine, this should be intuitive even if you know physics. Stars closer to the central mass would be spinning faster than stars outside.

It is therefore expected that measuring the orbital velocity of the star should be slower at the edges than at the inside.

In other words, if we measure velocity as a function of distance, and only this time show a graph, we would expect velocity to decrease as distance from the galactic center increases.

Once these measurements are taken, we find that velocity is essentially constant as a function of distance.

If it's constant, it means the stars here are feeling the gravitational influence of matter we can't see.

In fact, this galaxy and all others appear to be embedded within this invisible cloud of dark matter.

And this cloud of matter is much more spherical than the galaxy itself and extends much wider than the galaxy itself.

So while we look at a galaxy and focus on it, it is actually clouds of dark matter that govern the structure and dynamics of this galaxy.

Galaxies themselves are not randomly scattered in space. They tend to cluster.

This is an example of the coma cluster, which is actually a very famous cluster.

And there are thousands of galaxies in this galaxy cluster.

It's the white, blurry oval thing right here.

These galaxy clusters will look the same whether you take a snapshot now or ten years from now.

But these galaxies are actually moving very fast.

They roam the gravitational potential wells of this star cluster.

So all these galaxies are in motion.

We can measure the velocities and orbital velocities of these galaxies to get an idea of ​​how much mass there is in this cluster.

And again, what we have discovered is that there is much more mass out there than we can explain in the galaxies we see.

Alternatively, if you look elsewhere in the electromagnetic spectrum, you'll find that this cluster has similarly large amounts of gas.

But that doesn't explain mass.

In fact, this invisible or dark matter form appears to have about 10 times the mass of normal matter.

I wish we could see this dark matter a little more directly.

I put this big blue blob there to remind you that it's there.

Can we see more visually? Yes, I can.

Now let's discuss how to achieve this.

There is an observer here. it could be the eyes. It may be a telescope.

And suppose there are galaxies in this universe.

How do we see that galaxy?

A ray of light leaves a galaxy and travels through space, perhaps billions of years, before reaching a telescope or the human eye.

So how do we guess where the galaxy is?

Well, you guessed it by the direction the light travels when it hits your eye, right?

We say the ray came this way. The galaxy should be there, okay.

Now, suppose we put a cluster of galaxies in the middle. Also don't forget about dark matter.

Now, when considering another ray emitted in this way, we must consider what Einstein predicted when he developed his general theory of relativity.

And that is that the gravitational field not only deflects the trajectory of particles by mass, but also the light itself.

Therefore, this ray of light may not travel in a straight line, but rather bend into our eyes.

Where in the galaxy will this observer see?

You can handle it. Up right?

Extrapolating backwards, we can say that the galaxy is here.

Are there other rays from that galaxy that could enter an observer's eye?

Yes, great. I see people falling like this.

Therefore, the ray can bend downwards and enter the observer's eye, where the observer sees the ray.

Now, consider the fact that we live in a three-dimensional universe, a three-dimensional space.

Are there any other rays that might catch your eye?

yes! The rays, which I would like to see, are, yes, on the cone.

That is, there is a whole ray, a cone of rays, all of which are bent by that cluster and enter the observer's eye.

What would I see if a cone of light entered my eye?

circle, ring. It's called the Einstein ring. Einstein predicted it, yes.

Now, in this case, we have a perfect ring only if the light source, deflector, and eyeball are all in a perfect straight line.

Slightly distorted will give you a different image.

Well, let's do an experiment at the reception tonight to see what that image looks like.

Because it turns out that there are lenses that can be manipulated with the right shape to produce this kind of effect.

This is called gravitational lensing.

So this is your instrument, OK.

(laughter).

But ignore the part above.

What I want you to focus on is the base, yes.

So, in fact, every time I break a wine glass at home, I save the bottom and take it to the machine shop.

Shaving it off created a tiny gravitational lens.

It is therefore well shaped to create a lens effect.

So the next thing you need to do in your experiment is get a napkin. I grabbed the graph paper. i am a physicist. (Laughs) Then napkins. Draw a model of a small galaxy in the middle.

And if you put your lens over the galaxy, you'll see that you can see rings, Einstein rings.

Then move the base sideways and the ring will split into arcs.

And you can put it on any image.

If you look at the graph paper, you can see how all the lines on the graph paper are distorted.

Again, this is a kind of accurate model of what happens with gravitational lensing.

Now the question is, does this look empty?

For example, if you look at a cluster of galaxies, do you see arcs in the sky?

The answer is yes.

So here's an image from the Hubble Space Telescope.

Many of the images you see were taken earlier from the Hubble Space Telescope.

First of all, regarding the gold galaxies, these are the galaxies within the cluster.

They are embedded in a sea of ​​dark matter, causing the bending of light to actually create the illusion of a background galaxy, a mirage.

So the fringes you're seeing, all these fringes, are actually distorted images of galaxies that are far, far away.

So what we can do is calculate how much mass should be in this cluster based on how much distortion we see in those images.

And that's a huge amount.

You can also see that these arcs are not centered on individual galaxies.

They are centered around a more extended structure, which is the dark matter in which the clusters are embedded.

So this is at least the closest we can get to seeing dark matter effects with the naked eye.

So do a quick review and make sure you're following along.

So the evidence that a quarter of the universe is dark matter (gravitationally attracted matter) is that galaxies and stars are orbiting galaxies too fast. It must be embedded in dark matter.

The speed at which the galaxies in the galaxy cluster orbit is far too fast. It must be embedded in dark matter.

And we see these gravitational lensing effects, these distortions, again indicating that the clusters are embedded in dark matter.

OK. Now let's turn to dark energy.

Therefore, to understand the dark energy evidence, we need to discuss what Dr. Stephen Hawking mentioned in the previous session.

And that is the fact that space itself is expanding.

So let's imagine a slice of the infinite universe--so we've put four spiral galaxies, okay--and imagine we've put a tape measure. So every line here corresponds to a horizontal or vertical tape measure to measure where things are.

If we could do this, we would find that with each passing day, each year, each billion years, the distance between galaxies increases.

It's not because galaxies are moving away from each other through space.

They aren't necessarily traveling through space.

Space itself is getting bigger, so they are moving further away from each other.

That means the expansion of the universe or space.

So they move further away.

Now, as Dr. Stephen Hawking also mentioned, the universe expanded very rapidly after the Big Bang.

However, due to the gravitationally attracted matter embedded in this space, the expansion of space tends to slow down.

Therefore, expansion slows down over time.

So, in the last century, people debated whether this expansion of the universe would last forever. If it slows down, you know, it slows down, but it lasts forever. It slows down to a stop and asymptotically stops. Or slow down, stop, then reverse and start contracting again.

So just over a decade ago, two groups of physicists and astronomers set out to measure the rate at which the expansion of the universe slowed down.

How much less expansion is there today than, say, billions of years ago?

From these experiments, the surprising answer to this question was that the universe today is expanding at a faster rate than billions of years ago.

So the expansion of the universe is actually accelerating.

This was an absolutely astonishing result.

There is no compelling theoretical argument as to why this happens.

No one predicted in advance that this would be discovered.

It was the opposite of what I expected.

So we need something that can explain it.

Now, in mathematics we can describe this as the term energy, but it turns out that this is a completely different kind of energy than we have seen before.

We call it dark energy and it has the effect of expanding space.

But I don't have enough motivation to introduce it at the moment.

So it's completely inexplicable why you need to put it there.

Now, at this point, what I really want to stress is, first of all, dark matter and dark energy are completely different things.

There are actually two mysteries about what makes up most of the universe, and they have very different effects.

Because dark matter is gravitationally attracted, it tends to encourage structure growth.

Therefore, because of all this gravity, galaxy clusters tend to form.

On the other hand, dark energy expands the space between galaxies more and more, reduces the gravitational attraction between galaxies, and hinders the growth of structures.

Thus, looking at things like clusters of galaxies and their number density and number as a function of time, we can learn how dark matter and dark energy compete in structure formation.

Regarding dark matter, I said I don't have a really convincing argument for dark energy.

Is there something about dark matter? The answer is yes.

We have a motivated candidate on dark matter.

So what does it mean to be highly motivated?

That is, there are actually mathematically coherent theories put in place to explain completely different phenomena, OK, we haven't talked yet, but each predicts the existence of new particles with very weak interactions.

So this is exactly what you want in physics. In other words, predictions come from mathematically coherent theories that are actually developed for something.

But we don't know if any of them are actually dark matter candidates.

Either or both, no one knows. Or it could be something completely different.

Well, we look for these dark matter particles. Because, after all, they're here in the room and OK, they didn't come in through the door.

they just go through anything.

They can invade through buildings and earth, but they don't interact at all.

Therefore, one way to look for them is to build detectors that are highly sensitive to passing and colliding dark matter particles.

A crystal that rings.

So one of my colleagues and his collaborators developed such a detector.

And they installed it deep underground in an iron mine in Minnesota, Oklahoma, and in fact released their most confidential results yet in the last few days.

Of course they don't see anything, but there are limits placed on the mass and interaction strength of these dark matter particles.

Later this year, a satellite telescope will be launched to look toward the center of the galaxy to see if it can observe dark matter particles annihilating and producing gamma rays, which could be detected.

The Large Hadron Collider, the Particle Physics Accelerator, which is due to come online later this year.

Dark matter particles may be produced in the Large Hadron Collider.

Now, they're so non-interactive that they'll actually escape the detector, so their signature lacks energy.

Unfortunately, there's a lot of new physics that could be missing energy, so it's hard to tell the difference.

And finally, as a future effort, there are telescopes specifically designed to address the problem of dark matter and dark energy — ground-based telescopes, and three space-based telescopes currently in the race to be launched to study dark matter and dark energy.

So as to the big question, what is dark matter? What is dark energy?

A big question facing physics.

I'm sure you have a lot of questions and I'm really looking forward to answering them over the next 72 hours while I'm here. thank you.

(applause)

Whether it's portraying an arguing family, quiet declarations of love, or joyful gossip, Jane Austen's writings often feel as if they were written just for you.

Her dry wit and cheeky playfulness inform the heroines, and her conversational tone welcomes readers with an intriguing wink.

Some readers are said to have exchanged letters with their pleasantly mean friend Jane, feeling like the author's secret confidant.

But this uniquely tongue-in-cheek humor is just one of many feats found in her sly satire on society, civility, and epic romance.

Written in the early 19th century, Austen's novel deciphers the sheltered life of the upper classes in rural England.

From resentment embedded in small talk to arguments about hidden charm, her work explores the dizzying clash of emotions and etiquette.

But while romance was a common element in her work, Austin rejected the sentimental style that was so popular at the time.

Instead of a lofty love story, her characters act naturally and often awkwardly.

They exchange practical advice, friendly jokes, and not-so-friendly rants about their arrogant peers.

Austen's characters manage to find humor in all of their hypocrisy, courtesy, and small talk as they wrestle with society's endless rules.

Bennett jokes to his favorite daughter, "What are we living for? What are we living for but playing sports for our neighbors and laughing at them in our turn?" And while her heroines may scoff at meaningless social conventions, Austen fully understood the practical importance of maintaining appearances.

At the time she was writing, wealthy marriage was a financial necessity for most young women, and she often explored the tension between the mythical quest for love and the financial gains of dating.

Bright socialite Mary Crawford sums it up in "Mansfield Park." "If they can get married properly, I want everyone to get married. I don't like to make people abandon themselves." Not surprisingly, these themes also existed in Austen's personal life.

Born in 1775, she lived in the social circles of the novel.

Jane's parents supported her education and provided a space where she could write and publish anonymously.

But writing was hardly a lucrative business.

And even though she had a spark of chemistry, she never got married.

Elements of her situation are found in many of her characters. They are often intelligent women with witty, down-to-earth personalities and rich inner lives.

These stalwart heroines provide an entertaining anchor for an eventful and romantic tale.

Like the irreverent Elizabeth Bennett in Pride and Prejudice, her devotion to her sister's love makes her blind to clumsy suitors.

Or the iron-willed Anne Elliott of Persuasion, who chose to remain unmarried after her first love disappeared.

And in Sense and Sensibility, Eleanor Dashwood sacrifices her own desires to protect her family.

These women all face difficult choices in love, filial piety, and financial security, but they resolve them without sacrificing their values ​​or sense of humor.

Of course, these characters are far from perfect.

They often think they have all the answers.

And by telling the story from their point of view, Austen tricks the viewer into thinking the heroine knows best, only to pull the rug out from under the hero and the reader.

In "Emma," the title character feels surrounded by dull neighbors and friends who cannot be expected to match her wit.

As guests go on and on about nothing, readers begin to agree. Emma is the only exciting character in this quiet neighborhood.

However, despite Emma's inflated ego, she may not be as in control of her life and relationships as she thinks.

And Austen's intimate use of perspective makes these reveals doubly amazing, blinding both Emma and the viewer.

But these flaws do not demean her numerous heroines, but only confirm "the contradictions of all human characters." Its complexity has made Austin a prominent presence on stage and screen, and has allowed her work to be easily adapted for contemporary sensibilities.

So I hope new readers continue to find Ms. Austin's friends for years to come.

"Can you taste the words?"

That was the question that surprised me.

This summer, when I was giving a talk at a literary festival and signing a book afterwards, a teenage girl came up with a friend and asked me:

I told her that some people experienced overlapping sensations, like hearing colors and seeing sounds, and that many writers, myself included, were fascinated by this subject.

But she got a little annoyed and cut me off, saying, "Yeah, I know all that.

It's called synesthesia. We learned it in school.

But my mom is reading your book and she says there's a lot of food and ingredients in it and a long dinner scene.

She gets hungry every time she reads the page.

So I thought about why I'm not hungry when I write.

And maybe you can taste the words, I thought.

Does it make sense? ”

And, in fact, it made sense. Because since my childhood, each letter in the alphabet has a different color, and colors have brought me a taste.

For example, the color purple is quite a stimulating, almost perfume-like color, and all the words I associate with purple, such as 'sunset', taste the same. This is a very spicy word.

But I was worried that telling all of this to a teen might sound too abstract or too weird. And since people were waiting in line and I was running out of time anyway, it suddenly felt like what I was trying to convey was more complicated and detailed than the situation would allow.

And I did what I always do in similar situations: I stuttered, shut my mouth, stopped talking.

Deep down, I knew I should never be silent for fear of complexity, but the truth was complicated, so I stopped speaking.

So today, I would like to start with the answer that I couldn't say that day.

Yes, I can taste words—sometimes, that is, not always, and happy words have a different flavor than sad words.

i like to explore What does the word 'creativity' or the words 'equality', 'love', 'revolution' taste like?

What about "homeland"?

This last word in particular has been haunting me lately.

Sweet flavors of cinnamon, a touch of rosewater and golden apples linger on the tongue.

Beneath it, however, are sharp notes of nettle and dandelion.

The taste of my homeland, Turkey, is a mixture of sweet and bitter.

I say this because I think there are more and more people around the world today who have similar mixed feelings about where they come from.

We love our motherland, don't we?

How can you not?

We feel attached to people, cultures, land and food.

But at the same time, we feel more and more dissatisfied with the politics and politicians, sometimes despair, hurt and even angry.

I want to talk about the need to increase emotional and emotional intelligence.

I think it's a shame that mainstream political theory pays so little attention to emotion.

Analysts and experts are often too busy processing data and metrics to forget everyday things that are difficult to measure and perhaps impossible to cluster based on statistical models.

But I think this is wrong. There are two main reasons for this.

First of all, because we are emotional creatures.

As humans, I think we all do.

But second, and this is new, we are entering a new phase in world history where collective sentiment guides and misguides politics more than ever before.

And through social media and social networking, these emotions are amplified, polarized, and spread around the world at breakneck speed.

Our time is a time of anxiety, anger, mistrust, resentment, and perhaps many fears.

The problem, however, is that while there is a lot of research on economic factors, there are relatively few on emotional factors.

Why do we underestimate emotions and perceptions?

I think this will be one of our greatest intellectual challenges, as our political system is rife with emotion.

Country by country, we have seen illiberal politicians exploit these sentiments.

But in academia and among intellectuals, we still don't take our emotions seriously.

I think you should.

And just as we should focus on economic inequalities around the world, we need to pay more attention to the emotional and cognitive gaps around the world and how to bridge those gaps. because they are important.

Many years ago, when I was still living in Istanbul, an American scholar who studied women writers in the Middle East came to see me.

And at one point in our exchange, she said, "I understand why you are a feminist, because you live in Turkey."

And I said to her, "I don't understand why you're not a feminist, because you live in America."

(Laughter) (Applause) And she laughed.

She took it as a joke and the moment passed.

(Laughter) But the way she divided the world into two imaginary camps, two opposing camps, stuck with me and stuck with me.

According to this imaginary map, some parts of the world were liquid nations.

They were like unsettled, rippling water.

The rest of the world, the West, was solid, safe and stable.

In short, feminism, activism and human rights are in need of a land in flux, and those of us who unfortunately come from such places have had to continue to fight for these most essential values.

But there was hope.

As history has moved on, even the most volatile lands will eventually catch up.

And meanwhile, the people of a strong land could rest in the progress of history and the triumph of the liberal order.

They could support the struggles of others elsewhere, but they themselves no longer had to struggle to get the basics of democracy. Because they were beyond that stage.

In 2016, I think this hierarchical geography shattered into pieces.

Our world no longer follows this dualistic pattern in the minds of scholars, if at all.

Now, we know history doesn't always move forward.

Sometimes it takes circles, sometimes it takes a step back, and you could make the same mistakes that generations of great-grandfathers made.

And now we know that there is no such thing as a solid country and a fluid country.

In fact, as the late Sigmund Baumann said, we all live in fluid times.

And Baumann had a different definition of our time.

He used to say that we would all be walking on moving sand.

If so, I think women should be more worried than us men. Because when society reverts to authoritarianism, nationalism and religious fanaticism, women have much more to lose.

That is why I believe this has to be an important moment not only for global activism, but also for global sisterhood.

(Applause.) But before we go any further, I want to make a few confessions.

Until recently, whenever I attended an international conference or festival, I was one of the more melancholy speakers.

(Laughter) After years of watching how our dreams of democracy and coexistence were being shattered in Turkey, slowly and at an alarming rate, I've been feeling pretty depressed.

And there were several other brooding writers at these festivals, coming from Egypt, Nigeria, Pakistan, Bangladesh, the Philippines, China, Venezuela, Russia, and more.

And we smiled with pity, this doomed friendship.

(Laughter.) And you could call us WADWIC: Worried and Depressed Writers International Club.

(Laughter) But then things started to change and suddenly our club became more popular and we started getting new members.

I remember -- (laughter) I remember the first Greek writers and poets coming in and participating.

Then writers from Hungary and Poland, and, interestingly, writers from Austria, Holland, France, and England, where I live and call home, and American writers.

Suddenly, more and more people are feeling anxious about the fate of our country and the future of the world.

And perhaps there were more of us who now feel like strangers in our homeland.

And then this strange thing happened.

People who were very depressed for a long time started feeling less depressed, but newcomers are now more depressed because they are not used to feeling this way.

(Laughter.) You can see writers from Bangladesh, Turkey and Egypt trying to comfort their colleagues in the US after Brexit and the election.

(Laughter) But all jokes aside, I think our world is full of unprecedented challenges. This is accompanied by an emotional backlash. Because in the face of rapid change, many want to slow down, and when there is too much unfamiliarity, people crave the familiar.

And when things get too complicated, many people look for simplicity.

This is a very dangerous crossroads, as this is exactly where demagogues intervene.

The demagogue understands how the collective feeling works and how he (usually he) can benefit from it.

He says we all belong to our own tribes and we are safer when we are surrounded by the same things.

Demagogues come in all sizes and shapes.

It could be the eccentric leader of a frontier party somewhere in Europe, an Islamic extremist imam preaching doctrine and hatred, or an orator elsewhere praising the Nazis for their white supremacy.

All these numbers seem disconnected at first glance.

But I think they feed each other and need each other.

And when I look at how demagogues speak and inspire movements around the world, I think they have something in common. That is, they dislike pluralism very strongly.

Cannot handle multiplicity.

Adorno often said, "Intolerance of ambiguity is a sign of an authoritarian character."

But I ask myself. What if the same signs, the same intolerance of ambiguity, were the vestiges of our times, the times we live in?

Because everywhere you look, the nuances have dried up.

In a TV show, one speaker against something is placed against the one in favor of it.

yes? That's a good evaluation.

Yelling at each other is even better.

Even in the academic world on which our intellect should be cultivated, we find atheist scholars competing with staunchly theist scholars, but it is not a real intellectual exchange because it is a clash of two beliefs.

I think dichotomy is everywhere.

Very slowly and systematically we are denied the right to be complex.

Istanbul, Berlin, Nice, Paris, Brussels, Dhaka, Baghdad, Barcelona, ​​we have witnessed one terrible terrorist attack after another.

And expressing grief or protesting against that cruelty gets all sorts of reactions and messages on social media.

But one of them is very worrying, simply because it is so prevalent.

They say, "Why do you feel sorry for them?

Why do you feel sorry for them?

Why don't you feel sorry for Yemeni civilians and Syrian civilians? ”

And I don't think those who write such messages understand that the Middle East, Europe, Asia, America, everywhere, equally and at the same time, can sympathize and stand in solidarity with the victims of terrorism and violence.

They don't seem to understand that we don't have to choose one pain or one place over all others.

But I think this is what tribalism brings us.

It certainly shrinks our hearts, but it also shrinks our hearts so much that we are oblivious to the suffering of others.

And the sad truth is, we weren't always like this.

I published a children's book in Turkey and had a lot of events when the book was published.

I went to many primary schools and had the opportunity to observe young Turkish children.

And it was always amazing to see how much empathy, imagination, and silliness they had.

These children are much more likely to become global citizens than nationalists of that age.

And if you ask them, so many of them want to be poets and writers, and it's great that girls are just as confident, if not more, than boys.

But then I went to high school and everything changed.

Now no one wants to be a writer, no one wants to be a novelist, and girls have become cowardly, cautious, cautious, and hesitant to speak out in public. That's because we've taught them in families, schools, and societies to erase their individuality.

Whether in the East or the West, I think we are losing diversity within our societies and within ourselves.

Being from Turkey, I know the loss of diversity is a great loss.

Today, my homeland has become the world's largest prison for journalists, surpassing even China's sad record.

And I believe what happened in Turkey can happen anywhere.

It can happen here too.

So, just as a strong nation was an illusion, so is a single identity, because we all have multiple voices in our hearts.

Hafiz, an Iranian Persian poet, said, 'You have in your soul all the elements necessary to transform your existence into joy.

All you have to do is mix these ingredients together. ”

I think you can also mix.

I'm Istanbulite, but I also have an attachment to the Balkans, the Aegean, the Mediterranean, the Middle East and the Levant.

I am European by birth, born by choice and by the values ​​I stand for.

I have become a Londoner over the years.

I like to think of myself as a global soul, a global citizen, a nomad and a traveling storyteller.

Like all of us, I have multiple obsessions.

Also, multiple attachments mean multiple stories.

As writers, of course, we are always chasing stories, but I think we are also interested in silence, what not to say, political taboos, cultural taboos.

We are also interested in our own silence.

I have always been very vocal and have written extensively on minority rights, women's rights and LGBT rights.

But as I was thinking about this TED talk, I realized something. I never had the courage to publicly say I was bisexual. Because I was so afraid of the slander, prejudice, ridicule and hatred that would inevitably follow.

But of course, we should not remain silent for fear of complexity.

(Applause.) And I'm used to anxiety, but I'm talking about the power of emotions here, I know the power of emotions, but over time I've realized that emotions aren't limitless.

Look? they have their limits.

There comes a moment when you get tired of feeling scared or tired of feeling anxious – it's like a tipping point or a threshold.

And I think that not only individuals but also nations probably have their own turning points.

So even stronger than my feelings is my perception that not only gender, not just identity, but life itself is in flux.

They try to divide us into tribes, but we are connected across borders.

They preach certainty, but we know there is a lot of magic in life and a lot of ambiguity.

They like to fan duality, but we are much more subtle than that.

So what can we do?

I think we need to go back to basics and get back to the colors of the alphabet.

The Lebanese poet Khalil Gibran used to say, "I learned silence from the talkative, tolerance from the intolerant, kindness from the unkind."

I think it's a great slogan for the times.

So we learn the imperatives of democracy from populist agitators.

And from the isolationists we will learn the need for global unity.

And from tribalists we learn the beauty of internationalism and the beauty of diversity.

Finally, I would like to say one word, or even just one word, of my impressions.

"Yurt" means "motherland" in Turkish.

It means "motherland".

Interestingly, however, the word also means "tent used by nomads."

i like this combination. Because it makes me think that the Motherland doesn't have to be rooted in one place.

Portable.

You can take it with you anywhere.

And I think for writers, for storytellers, at the end of the day, there's one primary home, and it's called "Storyland."

And the taste of the word is the taste of freedom.

thank you.

(applause)

My favorite topic is shortcuts.

Master of shortcuts, it's natural of course.

But I'll show you different ways to get to the point, to remove the difficulty and probably find the answer much quicker than Arthur. So, first of all, we break common sense, logic. Everyone, if you hold hands like this, it's 90 degrees - everyone. not you

Everyone is like that, right? Turn your palms up.

If you do this, the general logic is that you should rotate your wrist.

do you agree?

good.

But I'll teach you how to do it without moving your wrist first, and a shortcut.

You can do it right away, right?

Hold your hands like this with your palms up.

Keep your wrist still. Wrists—I don't talk much about them, but they do their best to be who they are.

What do you think is the correct shape for iron?

Actually it was a joke, and I—Okay.

Hold it with your palm facing up. Keep your wrist still.

Do not move your wrist over your heart.

Do not move your wrist forward.

Keep your wrist still. Do not move your wrist over your heart.

and forward. yes.

Now -- (laughter) -- logically, you'd get to this position from here without moving your wrist.

(Laughs) Well, it's a shortcut.

(Laughter) But it was six moves. Now you are done with one hand.

I'll start here, palms down, you follow.

then look at me

yes! (laughter) One move. OK.

So it was a warm-up.

I need an assistant now.

I spoke to a lovely girl, Zoe, a while ago.

she left no! big hands.

(Applause) Good. good. And you can sit there.

One of the items here was water.

And I salute water.

I think just water is enough for me. Others can talk about it - cheers.

(Laughter) Beer contains a lot of water.

(Laughs) So, from now on, I will explain how to memorize and how to control cards.

I'm thinking of removing this.

I work with a special method to do it quickly.

I'm doing exactly the job -- oh sorry -- control and very powerful...

It's a memory system, right?

(laughter) So if I studied poker. i like gambling

I don't officially gamble, but...

So if there are 5 of us, I'm going to play a 5-hand poker game.

We are going to have a conversation. The same person can't answer because it's a different person each time.

So there is agreement.

Which one has a better poker hand?

which number? 1, 2, 3, 4 or 5? (audience: 3) Lennart Green: 3 -- Good.

And here we have a mat to do a little thing. This is the key moment. sorry.

If the card shark collects cards, collect them immediately before dealing them. Well, thirdly, we have arranged for a full house.

(laughter) With the Queen, that's fine, but with the Queen and dozens.

It's a challenge. i like this.

I will explain later. 1, 2, 3, 4, 5.

We start with the three queens.

Here you can see the contrast when the cards are processed.

and 20.

yes. thank you.

(Applause) But if other people have good hands, the other hand will be good too.

So these guys actually have stronger hands: 3 Aces and 2 Kings.

This man beats them with four of a kind, or deuce, or deuce.

No response? That too -- OK, and this.

These appear to be in order, but perhaps - hopefully - they are. 3, 4, 5, 6, 7, and...

But, of course, it's me who holds the winning hand.

Ten, Jack, Queen, King, Ace.

yes. very good.

(Laughter) So the hand that looked really good from the start, the last number 3, was actually the lowest hand.

Life like that. right?

So mix it up.

If you're interested, here are some underground techniques.

yes?

I'm doing some kind of extrapolation, shuffle tracking -- oh, nice.

Impressive. thank you.

(Laughter) So the first term is the estimate.

Here you can accurately estimate how many cards are in play during the royal flush.

Of course you can count the cards, but it's much faster.

right? you agree

So actually I know exactly where the card is.

Here I can place bets and actually this is one of the points where I get my money.

10, Jack, Queen, King, Ace.

OK。

(Applause) Next is terminology. I do it quickly. I call this theft.

Now you know where your card is.

I will spread out the cards, so if I point to them, you will say "no". Point, please tell me to stop.

Zoe: Stop it.

LG: Here -- can you see what's missing?

That was card stealing, I did it.

(laughter) Okay.

Well, another term for it is shuffle tracking.

Shuffle tracking means I track cards even if others shuffle them.

This is a little dangerous.

So -- because if you look, you still see it.

do you agree But if it's square, it's square, shuffle, and cut.

So here I have to watch the shuffle from the beginning to follow my cards - oh we're starting out together. okay, okay

Come on -- no, no, no, no.

Just kidding, right?

Any Style -- Yes, that's fine.

I have to do the math here, but I really don't like doing it.

I work directly with my right brain.

If you pass the left brain, you must take care of logic and common sense.

Direct to the right brain, it's much better. So -- (laughter) -- Arthur Benjamin did a little bit of the same thing.

And if you work in the right atmosphere and with humor, it is the password to the bank of cosmic knowledge where you can find the solution to any problem.

OK. Well, I drop the card, but you say quit anyway, right?

Not the last card.

Zoe: Stop it. LG: Right.

I'll do it sooner when I'm sober, but I'll check.

(laughter) Oh, it was out of order, it was a mistake.

No, just kidding.

(Applause.) No, I put in some mistakes to emphasize how difficult it is.

right?

Yes, I forgot last night. It was a mistake.

But now I'm glad I remembered.

So I bought this deck here. sorry.

I put a little padding to make it a little softer.

This deck was purchased in the USA.

It's called a "bicycle". And although this deck is very flexible, not many people know about it. You can see how thin and flexible this deck is by checking in the right places, right?

I can carry this in my wallet...

Are you not responding because you can't see it?

(Laughter.) So, but here, and isn't the camera overdoing it? no.

(laughs) Is that so? (Audience: Too much talking.) LG: Excuse me? But when we get it back, you do this.

But not much.

After that, you need to press down again.

please. When you push these heaps, everyone notices, but when you push them together they are actually interlaced. yep, OK.

completely.

Just push through. thank you.

Then I'll demonstrate what I stole from the Russian satellite, stolen, stolen, probably copied from America, but that's what we'll see.

Here -- shortcut. Talk about shortcuts.

Now I'm going through the deck quickly and trying to find some patterns.

The new chaos theory is already old, right?

But you know, I think you know a lot about fractals, the Mandelbrot spiral, etc.

And it's much easier to memorize the cards in a pattern that requires less concentration. If you concentrate and calculate, you will be left brain. But if you just look and speak in another language...

Yeah great.

I think I have

So this time, various people, older people tap.

Whoever you are, please name the card.

(Audience: Jack of Spades.) LG: Jack of Spades.

Jack of spades.

I think the Jack of Spades is 12th from the top.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. Yes, it is.

So -- oh, Jack of Spades.

Did you say spade? (Audience: Yes.) LG: Oh.

it's my fault. Please don't clap, this was a club.

So Jack of Spades.

In my opinion ...

23 -- 24, sorry, 24.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 -- oh, 25, yes.

It is the end.

Now we do it faster and better.

OK. another person. Oh, I forgot, I don't think it should be shuffled, but I think -- (laughter) -- actually my technique is to always peek.

When I lift the mountain, I will take a peek.

Right, perfect.

3, 4, 5, 6. Then I calculate - yes, good.

(Laughter) Another person, another card. (Audience: Seven of Diamonds.) LG: Seven of Diamonds. Perfect, my favorite, yes, 7.

So I'm going to do it quickly, very quickly, but in slow motion, so follow along.

(laughs) Seven? (Audience: Diamond.) LG: Diamond, nice. Start here.

good, thank you

(Applause) What I did -- I peeked.

I know where the card is, so I picked it. So another person, another card.

(laughs) Another person.

(Audience: Diamond Ten.) LG: Excuse me?

(Audience: Diamond Ten.) LG: Diamond Ten, yes.

I think I am doing the same. I like to do that, so I know where it is.

10 diamonds.

But now you're doing it at normal speed, right?

10 diamonds.

good.

Maybe you can cut it? lift.

wonderful.

Thank you very much. Another person, another card.

(Audience: 5 members of the club) LG: Excuse me? (Audience: 5 people in the club.) LG: 5 people in the club. Even if it's the same place, it's not the same person.

I'll take it there later. Now drop the cards.

And everywhere, they will say stop. Did you take it?

Five of clubs.

Not the last. Yes, cards are hard to find here.

(laughter) I'll do it again.

Five people in the club are the ones telling you to stop when the cards are in the air, right?

(Audience: Please stop.) LG: Very good.

OK。

(Applause.) OK, I had to push a little harder.

I think I saved five clubs.

And now a card with five club contrasts.

(Audience: Queen of Hearts.) LG: Queen of Hearts, yes.

wonderful. i love that card

Now let's do the hardest thing.

For example, you are sitting in Las Vegas betting and you accidentally let other people peek at your card. Feel it, it's just a regular card.

And now when I lift this card, it will be your card. what was your card

(Audience: Queen of Hearts) LG: Queen? Queen of hearts.

That's a tough challenge, right?

So here I get -- do you know this? Five of the clubs...

and the Queen of Hearts. yes!

This is a difficult question. Because here I have to take advantage of it - I switch it with 5 clubs.

So now it's an incorrect count.

Which card should I use? Queen or 5?

Zoe: Queen. LG: Mistress, yes.

So I use Queen and I have 5 clubs here.

Wrong counting and numbers 1, 2, 3, 4, 5, 6, 7, 8 always refer to the same card.

8、9、10。

This is a kind of optical deal, right?

When you put a card on the table, it's not a single card. It's—you see, a bunch of cards that give this impression.

yes.

Now for some difficult things.

Yes, I think I'll keep the Queen here.

Now let's talk about satellites.

This is -- sorry, don't look at the beam. it's my fault.

(Laughter) It's a high frequency laser, enough to completely destroy the retina in a matter of seconds.

Yeah sorry i should have said that.

But it takes about 30 minutes to take effect, so relax. Enough time to watch my entire performance.

(Laughter) Okay, let's put the laser here. And when you deal the cards with a laser, you know where the cards are. But is it?

did the camera catch it?

no?

didn't you?

what happened?

(Audience: gone.) LG: Okay, I'll take another group.

Does the camera recognize the card?

no? (Audience: No, they're all gone.) LG: But you can see the hands.

Oh good, good, good But now.

Well, that's why, right?

can you see the card? yes.

(Laughs) Yes, that's good.

Now -- (laughter) -- one guy laughed. Well, to find the queen, do the following. Take back the other, take back the queen.

(Laughter) Well, it's interesting, but it's a little dangerous.

(laughs) I like it. Now, it gets a little more difficult.

Name -- Anyone, any name.

(Audience: Spades.) LG: Spades, spades, good.

So here we have a lot of cards to peek at.

I'm sure there are a lot of spades in the deck -- I don't know how many -- but at least 10-15 spades, right?

(Laughs) That's why every time you lift a mountain, you take a peek.

Then arrange for immediate availability.

perfect, wonderful.

So let's start with an ace -- yes, an ace. Oh yeah -- spades?

Same mistake as before, right?

So line up the spades and clubs.

I am trying to do this here. First, take a spade.

As you know, I don't do my job for honor, so I make mistakes all the time.

It doesn't matter to me.

And sometimes you get extra sympathy points, right?

1, 2, 3, 4 -- yes, got the camera? 5, 6, 7, 8 -- oh -- 9, 10, Jack, Jack of Spades, Queen -- I like that laugh, yeah! Good. Queen.

(Laughter) Wait, wait, wait -- take the card.

Grab any. Fast, fast, good.

And switch this to King.

ace of diamonds.

And now, look, the Ace of Diamonds leads the way.

So I find...

King of spades.

There was the place. And this is the King of Spades, right?

yes? OK.

(Applause) Now, it's a little more difficult.

Maybe you think I have the cards in order already, so please help me shuffle them again.

I'd like another suit, please.

(Audience: Armani) LG: Excuse me? (Audience: Armani) (laughs) LG: After the blindfold.

I like this guy, yes

OK. That should be the final result, but OK.

Armani -- Who said Armani? You?

I drop the card and you -- what size?

what size? That's a piece of cake. I like challenges

what size?

(Audience: Oversized.) LG: Oversized, OK.

Tell me to stop (Audience: No.) (laughs) LG: Yes, Armani. OK.

(Applause.) Oh, this is hard.

Yes, it's a suit. I used to have clubs and spades.

another suit. (Audience: Diamond.) LG: Diamond, perfect.

So in this case try to find diamonds. Look at the card, OK.

i will try. yes. help me.

This way, when you drop a card face up, you flip it. Zoe: Okay.

LG: Okay, then.

Do it quickly with both hands. yes, that's fine, that's fine

(Laughter) I think I've done it now. yeah, good, good

Here are diamonds, hearts, no, diamonds. Good, good.

stop. Can you see the pattern?

no? now?

Yes yes, I understand.

I work with patterns.

Oh sorry, I lost one.

Maybe it's important -- yes -- the 9 of Diamonds, okay.

So now I always ask, why put yourself in this position?

You have to find a lot of outs when you miss a few cards, but I love it. So now I do it. Try to find diamonds, but do it the hard way.

It's too easy to do right away, right?

I'll try it...

Blindfold.

At this distance, the effect is immediate.

ah!

(laughs) Duct tape.

I will shake the cards, so I won't.

please. yep, OK. I like empathy.

sympathy.

But it was—did you hear that?

It was a female voice. Listen to the man -- yes, more, more, more.

(Laughs) Yes, that's good. yes.

You can take a picture of your nostrils too, because some guys think I can peek through them -- (laughs) -- do more. go, go

right? good.

satisfaction?

It's cool, like Batman. Wow!

(Laughs) No, it has dignity and elegance.

But I like her, yes. I said, be a little tougher.

and it was ok. one more?

at last.

OK。

have understood.

Now, you should agree that I have to rely on my other senses, too, right?

I work with vibration.

So what was that card?

diamond. Oh, I remember my heart

So now I have to improvise again.

maybe you can stand up. half.

Diamonds -- Start with the Ace of Diamonds.

Just kidding, I'm warming up -- the King of Hearts.

(Laughter) So I'll give you the diamonds, so you've laid them out here neatly. And do you understand? good.

Ace of diamonds, right? Zoe: Yes.

LG: Good. good. Two -- (applause) -- thank you.

I never missed two. This is funny.

I always found two, but they were different colors. Spade, I'm sorry.

And since this deck is a gift for you later, let the skeptics here take a look. please remember. It's a gift.

Two -- that was the two of spades, right?

Sorry, two diamonds. I'll try it right away.

3 -- 3 of diamonds. yes!

4 -- I like challenges, yes.

yep, OK.

Chris Anderson: You're looking.

LG: Excuse me?

CA: You're peeping. Now this is a request from the lady behind me.

(Laughter) Okay.

Give it a try.

LG: Right. Please also listen to

okay now

This can be a little tough.

we'll try

yes? good?

(laughter) Okay. So how many cards? Five? Zoe: Four.

LG: Four. Is the next card a 5?

Zoe: Five of diamonds, yes.

LG: You're not here? Zoe: It's not there.

LG: Oh.

Here all the cards are face down. Do you agree? (Audience: Yes.) LG: Yes? can you see it on the screen?

And this is ostensibly, not down here.

So the next card was—I think it was five?

Zoe: Five. LG: Yes -- here it is flipped face up.

yes? Zoe: Yes.

LG: 6 -- 6 on the thumb.

Seven.

yes i will do this. I know the location because I've peeked before, but then I do this.

right?

eight.

If -- then it's 9, right?

yes.

Yesterday, the day before yesterday, I was in Las Vegas and used this for real.

Nine? yes? correct?

no? yes! Oh good, good

10 -- Again, I love this move by Johnny Wayne.

yes. Jack -- Jack and [unintelligible]?

Are you Jack of Diamonds? (Audience: No) LG: Yes?

And Mistress! Queen, you took the wrong direction.

misdirection. (Applause.) Right?

And, sir, just five seconds later.

yes. Five. 5 seconds.

1, 2, 3, 4 -- Hmmm!

please confirm.

yes?

CA: King of Diamonds. LG: Oh!

good. oh.

Touch, feel – oh, oh, you know!

CA: Hi everyone, Lennart Green! LG: Okay, thanks.

I am interested in dogs.

They are interested in sniffing each other and chasing squirrels.

And if you don't reward it with training, it's a distraction.

I always think that when I see a dog in the park, the owner calls the dog, and the owner says, "Puppy, come over here, come over here," and the dog says, "Hmm, that's interesting.

I'm sniffing other dog's butts because the owner is calling. ”

It's a difficult choice.

Rear, owner. The rear end wins.

So you lose.

You can't compete with your environment with an adolescent dog's brain.

That's why I always try to consider the dog's point of view when training.

Well, I'm here mainly because there's kind of a crack in dog training right now. On the other hand, some people think that training a dog is primarily about making rules, human rules.

We are not considering the dog's point of view.

So humans say, "You're going to act like this, damn it.

We intend to force you to act against your will and yield to our will. ”

Second, keep these rules secret from your dog.

And third, you can now punish dogs for breaking rules you didn't even know existed.

So you get a little puppy, he comes. His only sin is that he grew up.

When he was a little puppy, he would put his paw on your leg. Don't you think that's a good thing?

And you think, "Oh, there's a good boy."

You bend over, pet him, and reward him for jumping up.

His only mistake is that he is a Tibetan Mastiff. A few months later I weigh 80 pounds, you know.

Every time he jumps up, he gets all kinds of abuse.

I mean, dog abuse is really, really scary.

So this whole dominance problem, first of all, what dog training gives us is a Mickey Mouse interpretation of a very complex social system.

And they take this seriously.

Male dogs place a lot of emphasis on hierarchy to avoid physical conflict.

Of course, on the other hand, bitches that are bitches have some bitch modifications to the male hierarchy rules.

The first is "I have it, you don't."

And it turns out that a very, very low-ranking bitch will easily bone away from a high-ranking male.

So we bring this concept of superiority, or alpha dogs, into dog training. I'm sure you've heard of it.

Dogs are so abused.

Dogs, horses and humans, these three species are very abused in their lives.

And the reason is built into their actions, to always come back and apologize.

Like, "Oh, I'm sorry you had to hit me. I'm so sorry, yes, it's my fault."

They are very easily defeated, and that is why they are defeated.

Poor puppy jumps up and opens a dog book and what does it say?

"Grab the front leg, hold the front leg, stamp the back leg, spray lemon juice in the face, hit the head with a rolled up newspaper, hold the knee on the chest, and flip it over backwards."

because he grew up?

And is it because he's performing the behaviors you trained him to do?

This is insanity.

I ask the owner, "Then what kind of greeting would you like your dog to give?"

And people say, "Well, I don't know, maybe I should sit down."

I said, "Let's teach him how to sit."

And give him a reason to sit.

Because the first step is basically teaching the dog ESL.

I could talk to you and say, "Lai Tai Chai, Paige, Paige."

Come on, something should happen.

why don't you respond? Oh, you don't speak Swahili, do you?

Well, I have an announcement.

The dog can't speak English, American, Spanish, or French.

Therefore, the first stage of training is teaching your dog ESL, or English as a Second Language.

That's how we use bait lures on our hands, and we use bait because we're dealing with owners.

my wife doesn't need food. She is a great trainer and much better than I am.

It doesn't need food, but a typical owner would say, "Puppy, sit down."

Or say "sit, sit, sit."

They are doing hand signals in front of the dog's rectum for some reason. It's insane, as if the dog had a third eye there.

"Sit down, sit down."

No, I say ``Puppy, sit down'' and it works in 6-10 attempts.

Then, when the food is phased out, the dog will understand that "sit" means to sit, and you will be able to actually tell him in perfectly constructed English sentences.

"Phoenix, come here, take this and go to Jamie."

And I gave her "Phoenix," "Come here," "Take this," "Go," and my son's name, "Jamie."

Dogs can take notes and I have my own little search and rescue dog.

He finds Jamie everywhere, kids crushing stones in a river or something, and gives him a little message: "Hey, dinner is ready. Come over for dinner."

So at this point the dog knows what we want.

Can it be done?

Not necessarily.

Like I said earlier, if he's in the park and there's an ass he wants to smell, why would he come to his owner?

A dog lives with you, a dog always picks you up.

Dogs can smell your butt whenever you want.

Now he is in the park and you are competing with smells and other dogs and squirrels.

So the second step in training is to teach the dog to do what we want him to do, and this is very easy.

Uses the premack principle.

Basically, we track low-frequency behaviors (behaviors that dogs don't want to do) by high-frequency behaviors, commonly known as problem behaviors, or dog hobbies (things dogs like to do).

It becomes a reward for lower frequency behavior.

So we try to "sit" on the sofa. "Sit", rub the tummy. "Sit" look, I throw a tennis ball. "Sit" and greet the other dog.

Yes, I queued up "Smell Your Ass".

"Sit" and smell your butt.

Therefore, all of these distractions that used to negatively impact your training become effective rewards for your training.

What we are doing is essentially teaching the dog. We are making our dogs think they are training us.

And I can imagine this dog saying to, say, an Akita over the fence. "Wow, sir, they are incredibly easy to train.

They are like golden retrievers.

All I have to do is sit down and they do everything.

They open your door, drive your car, give you a massage, throw you a tennis ball, cook and serve you food.

It's like if I just sit down, that's my order.

And I have my own doorman, driver, masseuse, chef and waiter. ”

And now the dog is really happy.

And for me, this is always training.

Therefore, we motivate the dog to want to do it so that the need for punishment rarely arises.

Now, we move on to Phase 3. Sometimes daddy knows best.

There's a little sticker on the fridge that says, "Because I'm Daddy."

Sorry, no further explanation. "I'm Daddy, but you're not. Sit down."

And if, for example, your son's friend left the door open, the dog may need to know that you shouldn't cross this line.

This is a matter of life or death.

If you leave this sacred home, you could be run over in the street.

So there are some things you have to let your dog know "Don't do this".

So we have to force, but we don't have force.

People here are very confused about what the punishment is.

They think punishment is terrible.

I'm sure a lot of people do, right?

I think it's painful, scary, and disgusting.

It doesn't have to be.

There are several definitions of what punishment is, but one of the most common is that "punishment is a stimulus that reduces an immediate behavior and makes it less likely to occur in the future."

It doesn't have to be nasty, scary or painful.

And if you don't have to, then maybe you shouldn't, I say.

About a year ago I worked with a very dangerous dog.

The dog then sent its owner, brother-in-law, and child to the hospital.

And I only agreed to handle it if they promised to keep it inside the house and never take it outside.

That dog is actually euthanized now, but this was a dog I worked with for a while.

A lot of the aggression happened around the kitchen so while I was there this was my 4th visit but I stayed down for 4 1/2 hours with my dog ​​on the mat.

And he was kept there at the calm insistence of his owner.

When the dog tried to leave the mat, she said, "Rover, on the mat, on the mat, on the mat."

The dog broke downstay 22 times in 4 1/2 hours while she was cooking dinner because we had a lot of food related aggression.

Breaks became less and less.

Well, the punishment worked.

Problem behavior disappeared.

She never raised her voice.

Had she done so, she would have been bitten.

Yelling is not a good dog.

And many of my friends train grizzly bears, which are really pretty animals. If you've seen a grizzly bear on TV or in the movies, it's my friend who trained it, a killer whale. I love it because it does the wiring for me.

How are you going to scold a grizzly bear?

"Bad bear, bad bear!" Boom!

Your head is now 100 yards away and sailing through the air, okay?

I'm crazy

So where do we go from here?

I want a better way.

Dogs have better rights.

But for me, the reason actually has to do with dogs.

It has to do with watching people train puppies and recognizing that puppies have formidable social and relationship skills.

Not just with puppies, but with other family members in the class.

So my all-time classic is another "come here."

I see someone in the park. I don't want to wake you up, so I cover the mic when I say this. The park has owners, the dogs are here, and they say, "Rover, come here."

Rover, come over here. Rover, come here, you motherfucker. ”

"I don't think so," said the dog.

(Laughter) I mean, who in their right mind would think that a dog would want to come closer when it was screaming like that?

Instead the dog says, "I know that tone. I know that tone."

In the past, if you approached it, you were punished there. ”

I boarded the plane. For me, this was a pivotal moment in my career. And it really solidified the concept of what I wanted to do with this whole puppy training: how to teach a puppy in a dog-friendly way to want to do what we want, without having to force it.

As you know, I am puppy training my kid.

And the defining moment was that I was on a plane in Dallas and in the second row there was a father and a boy, probably about five years old, kicking the back of my chair.

"Johnny, don't do that."

kick, kick, kick.

"Johnny, don't do that." Kick, kick, kick.

I'm standing here with my bag.

The father bent down and grabbed him like this, making an ugly face.

And the ugly face is this. Face a puppy or child and say, "What are you doing! Stop, stop, stop!"

And I thought, "Oh my God, should I do something?"

She lost everything—one of the two trustworthy people in the world completely pulled out the rug from under her feet.

And I thought, "Should I tell this bastard to quit?"

“Ian, get out of there, get out of there, keep walking,” I thought.

I walked to the back of the plane, sat down, and a thought came to my mind.

If it was a dog, I would have put him by my side.

(laughter) If he had kicked the dog, I would have hit him.

He kicked the child and grabbed the child like this and I let it go.

That's all.

These relationship skills are pretty easy.

It's the shallowness of us humans choosing life partners based on the 3 C's: color, body shape, and cuteness.

Well, it's like a little robot.

That's how we started dating, and it was boring for a year.

And then some behavioral problems occur.

It's no different than a dog barking.

Husband doesn't put his clothes away, wife is always late for meetings, whatever it is, okay?

And so it starts and we get into this thing and our personal feedback -- there are two things about it.

Even when we see people interacting with animals and other people, we get very little feedback and too infrequently.

And when that happens, it's bad, it's nasty.

We see it especially in family members, especially spouses, especially children, especially parents.

We see it especially in the workplace, especially between bosses and employees.

It's as if there's some kind of schadenfreude out there, and we actually rejoice when people get things wrong, so we can moan, moan, and complain about them.

And I think this is the greatest weakness of humans.

It really is.

We take the good for granted and groan at the bad.

And I think the whole concept of these skills should be taught.

As you know, calculus is great.

As a child, I was a master of calculus.

I don't know anything about it now, but I did when I was a kid.

Geometric patterns are wonderful. As you know, quantum mechanics is a wonderful thing.

However, they do not maintain their marriages and do not raise children.

And my vision for the future is that what I want to do with this dog is teach people I know that your husband is easy to train as well.

Probably easier - if you have a Rottie - much easier to train.

Training your child is easy.

All you have to do is observe them, time-sample their behavior, and ask the question, "Is that a good thing or a bad thing?" every five minutes.

If it was good, say "It was very good, thank you."

It's a very powerful training technique.

This should be taught in schools.

Relationships -- How do you negotiate?

How do you negotiate with a friend who wants your toy?

How should I prepare for my first love?

How are you raising your children?

We think how we do it. You get pregnant in bed one night and then you're raising the most important thing in your life: your child.

No, this is what should be taught. A good life, a good habit that is as hard to break as a bad one.

That is my wish for the future.

Oh damn, I wanted to finish on time, but it was 8, 7, 6, 5, 4, 3, 2. thank you very much. That's my story, thank you.

(applause)

Ninety-nine percent of us have listener dreams.

You're a listener, not a musician, right?

And we always crave one thing, even though we don't know it.

We crave being in the room with the musicians the day it was recorded, the day it was played.

And we can go to live concerts and get as much of it as we can.

But then you listen to the remaining 99 percent of the recording.

And the further back in history I go, the more I realize it sounds a little rough.

So we said we have a solution for this.

Let's separate the performance of the object from the recording of how it was made.

You know, that there was a mic in the room, and all that day.

But the performance itself was how the musicians moved their fingers and what instruments they used.

And it is the data hidden inside the recording.

Achieving this requires a lot of hardware and software working at very high resolutions.

And Yamaha makes great things out there like the Disklavier Pro, a great grand piano.

And maybe you never thought it would do all these things, but it's full of solenoids, fiber optics, computers and all this stuff. Highest resolution in Japan.

And this didn't work until we crossed the line of high resolution.

And we were able to cross this line called the uncanny valley in artificial intelligence parlance.

We have a process that puts it into a computer, digitizes it, and then does a lot of analysis.

Then we look at all the notes and all the attributes of those notes: how hard they were pressed, how they were pressed, and how the fingers moved.

So we had to develop a whole new science of how we move our fingers.

And that's what piano teachers teach, but we didn't have the science to back this sort of thing.

Let's start with Glenn Gould.

It will be 25 years since I passed away this year, and 75 years since I was born.

He was a beloved pianist and perhaps the greatest cult pianist of the 20th century.

He had grown tired of standing in front of an audience, and actually felt that performing monkeys were his word.

So he stepped back and focused solely on creating his own work.

And Gould's specialty was playing Bach.

Perhaps his most famous recording is the one called "Goldberg Variations".

Bach wrote the theme and variations only once.

In his early years he wrote some works, but in his later years, in his maturity, he said, "This is the theme - 30 variations."

In fact, the theme isn't even the melody, it's the bassline.

And Gould, as you may know, recorded this song on two major recordings. One is mono and the other is stereo.

By the way, the monaural one he used pedals, and as he grew up he said, "No, no, wait a minute.

I'm going to be very scientific about this and not use pedals. ”

What I would like you to listen to live is the 1955 version, and I will play the first few songs.

Glenn Gould, 1955.

(music) How is it?

(Applause.) So let me tell you a little bit about how this is done.

First, let me walk you through the last step.

It's been a fairly involved process involving software and musicians and more, but when it's all done, you know your ears are the final arbiter.

You can play the original in one ear and the new recording in the other.

So now do what you just heard.

Then the right speaker will have the original recording, and the left speaker will have a new recording of an instrument that is actually exactly like that one, playing together at the same time.

(music) That's the original. [Unintelligible] It's two people together.

(music) Before "Jurassic Park," there was no science about how skin hangs from muscles, right?

In other words, in the world of video, we were able to invent natural movements while we were alive.

This is kind of another example of putting science behind natural behavior.

Then I listened to the original.

After all, I started with an experience.

And the experience is, "I want to be in the room and hear the musicians play."

Many people can afford to buy one of these.

But even if you don't, you now have high-definition surround sound.

And if you've never heard high-definition surround, go to an audio dealer -- an audiophile dealer.

Compared to normal stereo, it is very complicated.

But if you don't have that, you might be able to listen with headphones.

There are 5 recordings on the same disc and 5 recordings on Sony.

You can also listen to what is called a binaural recording through headphones.

A dummy head is placed in front of the instrument, and a microphone is attached to the ear position.

Put on your headphones and listen to this and you're in Glenn Gould's body.

And it's laughable until piano-playing musicians hear it and say, "I can't believe it! This is exactly what playing the piano is like."

However, now you are in Glenn Gould's body playing the piano, and it feels like your fingers are making the decisions and driving the whole process.

It's a game changer.

Here are some of the great quality information we know.

The whole process is very sensitive to temperature and humidity.

What I heard today wasn't perfect.

It is a combination of wood, cast iron, felt, steel strings, etc. and is amazingly sensitive to temperature and humidity.

So when you enter a recording session, you can stop song by song and rebuild the piano if you want.

The whole action is there, sitting on the side, with a dummy head and a recording engineer standing while we rebuild the piano.

As with anything that has happened in the last 35 or 40 years, music is digitized step by step without adding dates to these things.

Audio came very late in this game. I'm not talking about digitization, bits and remastering.

What I'm talking about is turning it into the original data, how that was done.

And the reason audio came so late is because it's so hard to fool our ears. The ears are high resolution and directly tied to our emotions, which cannot be easily fooled.

Your eyes are pretty happy with the color and movement.

Well, we have an episode of "Star Trek."

(Laughter) Okay. Everything was prepared for me there yesterday.

For me, the Star Trek episode is the one with James Daly as Methuselah – remember this one?

And at one point, he's dancing with his stuff — and I'm not going to spoil the 1967 episode for you.

So do you know where I'm going?

And sorry Nimoy, Spock sat down at the piano and started playing this Brahms waltz, and we all danced to it.

And Spock turned around and said, "James, I know all the Brahms waltzes, but I don't think this one falls into that category."

That's where I am.

I want to hear the waltz that Brahms didn't write.

I also want to hear the songs that Horowitz didn't play.

However, we believe we are now on the road to being able to extract styles, templates, expressions, etc. once we have the data. It's kind of like what's happening in the world of computer graphics all over again.

It is now coming to this world.

The transition will be this.

At this time it is written that we think of music as notes and the way they are played.

And I believe this is coming.

Because what you just heard is a computer playing data and there is no Glenn Gould in that room.

But still, it was human.

And we believe that we can reach the next step, the real dream of our listeners.

Today, every time I listen to the recording, every time I take out my iPod or whatever, every time I listen to it, it's the same thing - it freezes.

Wouldn't it be nice if each time you listened to something different?

This morning you want to hear your song, the same song, played sadder than yesterday.

You will want to hear performances by various musicians.

I want to listen in another room.

We've seen all these "Star Trek"s, and they're all Holodeck episodes as well.

I get goosebumps every time I hear it.

Very nice, very excited.

Every time I hear that recording, I think, 'Oh my God, I can't believe we're in the same room.

It's a much better experience than anything I've heard before in any way.

The end ends with one minute of Art Tatum.

So, this time I really went over my budget.

A new recording of his performance at the Shrine Auditorium in September.

It was a concert he recorded at the Shrine Auditorium in 1949.

And, let me tell you, we have a lab in Raleigh, NC where we manufacture and measure everything, and from there we flew to Los Angeles.

And as the president of the company, I was really not happy with the situation we were in.

When all the gear comes out and the whole Sony team and the crowd are sitting there, it's a really uncomfortable feeling.

And we put the piano in the sweet spot of the shrine stage, which has not changed since 1949 and still holds 6,000 people.

And in the sweet spot on stage, Tatum starts playing...

And every note, every beat, every slur, every accent, every pedal was perfect. Because he played it for that room that day.

And captured all that data again.

And I want you to hear it now.

And luckily it's here.

This is the encore he used to do.

It is 1 minute long.

This is Irish Jig and I want you to hear his humor.

(music) (applause) And that's exactly what the live audience did.

(Applause.) Thank you very much, Michael, thank you for the opportunity.

I am often asked what differentiates my work from the typical Pentagon long-term strategic planner.

And the answer I want to offer is what they usually do is think about the future of war in the context of war.

And in the 15 years that I've spent doing this work, it took me almost 14 years to figure it out. It's about thinking about the future of war among all other circumstances.

As such, I tend to specialize in scenes between war and peace.

The following material is just one idea in a book of many ideas.

Now it takes me around the world and interacts quite a bit with foreign militaries.

This material was produced during my two-year career as secretary of defense contemplating a new national grand strategy for the United States.

I would like to pose a problem and provide an answer.

This is my favorite painstaking concept in the 1990s Pentagon. It is the theory of anti-access, area-denial asymmetric strategies.

Why do we call it that?

Because all the A's are lined up.

This is outrageous because if the US were to fight anyone, we would be huge.

it will be smaller

And if they try to fight us in the traditional, outspoken way, we're going to kick their ass, which is why people won't do it anymore.

I actually met the last Air Force general who shot down an enemy plane in combat.

He is now a one-star general.

That's how far we are from even meeting an Air Force willing to fly against our Air Force.

So the problem arises from overpowering. The White House has called it a devastating success.

(Laughter) It's an amazing ability, so we're trying to figure it out.

The question is, what can you do with it?

OK？

Anti-access, area denial theories of asymmetric strategies - the ridiculous stuff we sell to Congress. Because just saying we can kick anyone's ass doesn't mean they'll buy us everything we want.

So we say area denial, no access asymmetric strategy, but their eyes are clouded.

(Laughter.) And they say, "Can you build it in my district?"

(Laughter) (Applause) This is my parody, but not much.

Let's talk about the battle space.

I don't know, Taiwan Strait 2025.

Let's talk about enemies embedded in that battlespace.

I don't understand, Million Man Swim.

(Laughter) The United States must have instant access to that battlespace.

They deploy anti-access, area-denial asymmetric strategies.

Paved banana peel.

(Laughter) Trojan horses on our computer networks quickly reveal our Achilles heel.

We say, "China, it's yours."

Prometheus' approach is largely geographic and focuses almost exclusively on the beginning of the conflict.

We are in charge of the first half team in a league that focuses on keeping the score until the end of the game.

That's the problem.

We scored well against everyone and could end up hurting in the second half. This is called the Fourth Generation War.

Instead, here's how I'd like to describe it.

There is no battle space that the US military cannot enter.

They said Afghanistan can't. We did it easily.

They said they couldn't do Iraq.

Inflicted 150 combat casualties in six weeks.

We did it so quickly that we weren't prepared for their downfall.

We have no one to beat.

The question is, what do you do with that power?

Therefore, there will be no problem accessing the combat space.

What is difficult for us to access is creating a transitional space that follows nature and a peaceful space that allows us to move forward.

The problem is that the Pentagon here has beaten you to the ground.

The State Department here says, "Well, I'm sure you can do it."

And that poor country would run off that ledge, do something cartoonish, and then go down.

(Laughter) It's not about overwhelming power, it's about proportional power.

This is about non-lethal technology. Because if you fire real bullets at a mob of rioting women and children, you'll quickly lose a friend.

This is not about projecting power, it's about maintaining power - legitimacy with the local population.

Who will you access in this transition space?

You need to create an internal partner. You need access to integration partners.

We asked the Indians for 17,000 peacekeepers.

I know their senior leadership, they wanted to give it to us.

But they told us

That transition space is almost always short of cattle.

We don't think you can make it, we're not going to bait you with 17,000 peacekeepers. ”

We asked the Russians for $40,000.

they said no.

In August, when I was in China, I said, "We should have 50,000 peacekeepers in Iraq.

It's your oil, not ours. ”

that is the truth. It's their oil.

Then the Chinese said to me, "Dr. Barnett, you are absolutely right.

In a perfect world there would be 50,000 people.

But it's not a perfect world and your administration isn't getting us any closer. ”

But I'm having trouble accessing the results.

Frankly, we were lucky with our choice.

We will be playing against different opponents in these three.

And it's time to start acknowledging that you can't ask the same 19-year-old to do it all day in and day out.

It's a mess.

We have an unparalleled ability to wage war.

Everything else is not well done.

Frankly, we're doing better than everyone else, but we're still no good.

We have a good Secretary of War.

We don't have a secretary in charge of everything else.

Because if he did, the man would still testify before the Senate about Abu Ghraib.

The problem is that he doesn't exist.

There is no secretary in charge of everything else.

I believe we have an unparalleled ability to wage war.

I call it the Leviathan Army.

What we need to build is power for all else.

I call them system administrators.

I think what this really represents is the lack of world-wide rules for dealing with politically failed states.

There is one for handling economically bankrupt states.

That's the IMF sovereign bankruptcy plan, right?

We discuss it every time we use it.

Argentina went through it and broke a lot of the rules.

They came out from the other side and we said, "Okay, don't worry."

It's transparent. A certain amount of certainty gives you a sense that the result is not zero.

We don't have the tools to handle the kind of politically bankrupt state that frankly everyone wants to disappear.

Like Saddam, like Mugabe, like Kim Jong Il, people who kill hundreds of thousands, millions of people.

Like 250,000 people have died so far in Sudan.

What will the A to Z system look like?

We will distinguish between the so-called first half and second half.

And this red line, I don't know, let's call it mission accomplished.

(Laughter) (Applause) At the beginning of this system, we now have the United Nations Security Council as a grand jury.

what can they do?

They can accuse your ass.

they can discuss it. They can put it on paper.

You can put it in an envelope, mail it, and say in plain language: "Cut it out."

(Laughter.) So about four million people died in Central Africa in the 1990s.

That means 250,000 people have died in Sudan in the last 15 months.

One day everyone will have to answer their grandchildren what you did about the Holocaust in Africa, and you better have an answer.

Nothing to move.

We have, 'You want me to beat that guy? I'll beat that guy.

I will do it on Tuesday. That would cost $20 billion. ”

(Laughter.) But here's the deal.

If you can't find anyone else to vent, leave immediately.

It's called the Powell Doctrine.

Farther downstream is the International Criminal Court.

They love to be put on trial. They now have Milosevic.

What are we missing?

We don't have a functional executive to put our will into action.

Every time we lead these efforts, we must whip ourselves against this imminent threat.

We have not faced an imminent threat since the Cuban Missile Crisis of 1962.

But we use this language from a bygone era to scare ourselves into doing something because we are a democracy and that is what we need to do.

If that doesn't work, yell "He's got a gun!"

just as we burst in.

(Laughter.) And then we looked over the bodies, found an old lighter and said, 'Yes, it was dark.

(laughs) Mr. France, do you want to do it?

France said, "No, but I like to criticize you after the fact."

What you need downstream is a powerful force enabled, what I call the Sys Admin Force.

250,000 troops were to enter Iraq following Leviathan's march on Baghdad.

What does that give you?

No looting, no armies gone, no weapons gone, no ammunition gone, no Muqtada al-Sadr - I'm breaking his bones - no rebellion.

Talk to someone who has been there for the first six months.

It took us 6 months to feel Rob and get the job done, and we messed around for 6 months.

And they turned against us.

why? Because they are just fed up.

They saw what we did to Saddam.

They said, "You have that power, you can restore this country.

you are america ”

What we need is the International Recovery Fund -- Sebastian Mallaby of The Washington Post, great idea.

IMF model.

Instead of handing over hats every time, okay?

where do you find this guy? G20, it's easy.

Check out their agenda after 9/11.

All security reigned.

They will pre-determine how the money will be used, just like the IMF.

Vote according to how much money you've put into kittens.

This is my challenge to the Department of Defense.

We have to build this power. The seeds of this power must be sown.

Coalition partners should be tracked. Create a record of success.

You get this model.

You say it's too difficult.

Walk this dog through a six-part series about the Balkans.

we did it that way.

I'm talking about normalizing it and making it transparent.

Do you want Mugabe gone?

Do you want Kim Jong Il, who killed about 2 million people, gone?

Want a better system?

This is why it is important to the military.

They have been experiencing an identity crisis since the end of the Cold War.

I'm not talking about the difference between reality and desire. I can say that because it is not inside the ring road.

(Laughter) It's the 1990s.

The Berlin Wall will fall. I'm going to do a dessert storm.

A rift is beginning to form among military personnel between those who see a future they can live in and those who see a future that, like the submarine community in the United States, sees the Soviet Navy disappear overnight, it begins to dread.

ah!

(Laughter) So they start moving from reality to desire, creating their own special language to describe their journey of self-discovery and self-realization.

(Laughter) The problem is, you need a big, sexy opponent to fight.

And if it is not found, it must be made.

China, everyone will grow up and become spectators!

(Laughter) The rest of the military was dragged into the quagmire throughout the 1990s and coined the very derisive term "military operations other than war" to describe it.

I ask, does anyone enlist in the military to do anything other than war?

In fact, most do.

Jessica Lynch never intended to shoot back.

Most of them don't pick up rifles.

I argue that this is an internal Army cipher of "we don't want to do this".

They spent the 1990s working in the chaos between the globalized part of the world, what I call the core, and the gap.

The Clinton administration had no interest in doing this.

Eight years after ruining a relationship on day one, the day of his inauguration, with gay men in the military, it was clever.

(Laughter.) So we were home alone for eight years.

And what did we do alone at home?

We bought one army and operated another.

It's like someone who goes to the doctor and says, "Doctor, it hurts when I do this."

(Laughter) The doctor says, "Don't do that, you idiot."

I was explaining this gist inside the Department of Defense in the early 1990s.

I say, "If you buy one army and operate another, you end up losing money. It's wrong.

Bad Pentagon, bad! ”

(Laughter) And they said, 'Dr. Barnett, you're really right.

Would you like to come back next year and remind me again? ”

(Laughter) Some people are saying 9/11 will heal the rift -- throwing the long-running change gurus out of their 30,000 foot historical perspective and dragging them into the quagmire and saying, "You want a networked adversary?"

I have it, it's everywhere, let's go find it. ”

It takes MOOTW (pronunciation of the acronym) from silly to grand strategy. Because that's how you close the gap.

Some people combine the two and call them an empire, but I think that's a tough concept.

Empire aims to enforce the maximum rule set that must be enforced, not just the minimum rule set that cannot be enforced.

It's not our system of governance.

I tried to interact with the outside world in ways we never had before.

I prefer the term "system administration".

We enforce a minimal set of rules to stay connected with the global economy.

Certain bad things you shouldn't do.

How does this affect our thinking about the future of war?

This is a concept that smears me across the Pentagon.

It's also very popular with me.

everyone has an opinion.

Going back to our country's beginnings, defense historically meant defending our homeland.

Security means everything else.

Our Constitution is written with two different forces, two different functions.

Raise your army when you need it and keep your navy for your daily connections.

Department of War, all other departments.

Big stick, baton stick.

Great network power.

In 1947, the two were merged under the Department of Defense.

Our long-term rationale is that we are embroiled in a dangerous conflict with the Soviet Union.

Attacking America means risking blowing up the world.

We connected national security and international security with a time lag of about seven minutes.

That's not our problem now.

They may kill 3 million people in Chicago tomorrow, but we're not going to bed with nukes.

That's where it gets scary.

The question is, how do we reconnect America's national security with global security to make the world more comfortable and to embed and contextualize the use of force on our planet?

What happened after that is the fork I described.

We talked about this all the way back to the end of the Cold War.

Let's create an army ministry and other ministries.

Some people say, "9/11 was your fault."

We have home games and away games.

(Laughter) Homeland Security is a good strategic move.

That will be the USDA of the 21st century.

TSA -- Thousands of people are standing around.

(Laughter) I supported the Iraq War.

He was a bad guy with multiple previous records.

It wasn't necessary to find him alive killing people in order to arrest him.

I knew that a war with the Leviathan army would be a catastrophe.

I knew it was going to be hard after this.

But I know this organization won't change until it fails.

What do these two different powers mean?

This is the Hobbes force.

I love this momentum. I don't want to see it go away.

In addition, nuclear precludes war between great powers.

This is the army the rest of the world wants us to build.

That's why I travel the world and talk to foreign militaries.

What does this mean?

That means we have to stop pretending that the same 19-year-old can have these two very different skill sets.

Morning, afternoon, evening, morning, afternoon, and evening.

Offer aid, shoot back, offer assistance, shoot back.

Too many.

19 years old is tired of switching, right?

(laughter) That power on the left, you can train a 19-year-old to do it.

The forces on the right resemble 40-year-old cops.

Experience is required.

What does this mean operationally?

Here are the rules:

That sysadmin troop is the one that never goes home and does most of your work.

Leviathan Force only breaks out occasionally.

But this is the promise you make to the American people, your people, and the world.

Breaking through the Leviathan Force is guaranteed to immediately kick off a massive sysadmin effort that follows.

Don't plan for war unless you have a plan for winning peace.

(Applause) Other differences. Leviathan's traditional partners, they all resemble the British and their former colonies.

(Laughter.) Including us, remember.

The rest are broad partners.

International organizations, non-governmental organizations, private volunteer organizations, contractors.

You will not be able to escape from it.

The Leviathan Army, it's all about joint operations between military branches.

That's all.

All we had to do was interagency business, and frankly, Condi Rice was in charge of that.

And I was surprised no one asked her that question when she was approved.

I call the Leviathan army your father's army.

I like them, young, male, unmarried and a little angry.

(Laughter) I call the system administration army your mother's army.

That's all the men's army hates.

They are much more gender balanced, older, more educated, married and with children.

Force left, up or out.

Right power, inside and outside.

Leftists respect the CPC's restrictions on the use of force in the United States.

The forces of the Right are trying to obliterate it.

That's where the National Guard is.

Left-wing forces will never fall under the jurisdiction of the International Criminal Court.

A system administrator must do so.

Various definitions of network centrality.

One to bring the network down and one to bring the network up.

And the war must be waged here in a way that facilitates it.

Need a bigger budget?

Do you need a draft to do this?

Absolutely not.

For years, I've been told by the military revolution crowd that we can do it faster, cheaper, smaller, and just as deadly.

I said, "Okay, let's take the sysadmin budget out of your skin."

This is the big point.

First of all, we will build a system management unit within the US military.

But perhaps two-thirds will be privatized in the end.

Interagency, internationalization.

Yes, it starts inside the Pentagon, but over time it crosses rivers.

(laughs) I went to the top of the mountain. I can see the future.

I may not live long enough to take you there, but it will happen.

We will have some other division between war and peace.

last slide.

Who gets custody of the child?

This is where the Marines in the audience get nervous.

(Laughter) And this is when they're thinking of slamming the shit out of me after the talk.

(Laughter) Read Max Boone.

This is Marine Corps history - small wars and small arms.

Marines are like my West Highland Terriers.

They wake up every morning wanting to dig a hole and kill something.

(Laughter) I don't want to hand over aid to the Marines.

I want them to be Marines.

That's what keeps the sysadmin army from becoming a fucking army.

It prevents being the United Nations.

You shoot these people the Marines are coming and trying to kill you.

(Laughter) (Applause) Navy Department, the strategic submarines are over here, the surface combatants are over there, and the news is that they might actually be that small.

(Laughs) I call it Smart Dust Navy.

I told my young officers, "In your lifetime you may command 500 ships.

The bad news is they may not have anyone. ”

A career is a swinging asset, so it goes both ways.

You can see the pattern of airlifting in the same way as an aircraft carrier.

Go here for the armor.

This is the Air Force's dirty secret, you can win by bombing.

But it takes many people on earth to win peace.

Shinseki's claim was correct.

Air Force, strategic airlift is two-way.

Bombers, fighters are coming here.

Special Operations Command quells in Tampa.

Trigger pullers go here.

Civil, that bastard kid is coming over here.

go back to the army.

Points about trigger pull and special ops command.

There is no off season and they are always active.

They stop by, run errands, and disappear.

See you now. Don't talk about it later.

(laughter) I wasn't here.

(laughs) The world is my playground.

(Laughter) I want to keep the people who pull the trigger trigger happy.

I want the rules to be as loose as possible.

Because when they stop killing 3 million people in Chicago and twisting our political system beyond anyone's comprehension, they'll be the first to kill them.

So it's better to have them make some mistakes along the way than watch it.

Reserve Components -- The National Guard overwhelmingly reserves system administrators.

How are you going to make them work for this unit?

Most of the firefighters in this country work for free.

This is not about money.

This is about being candid with these men and women.

The last point is intelligence agencies -- muscle and defense agencies go in this direction.

What the CIA should be, open, analytical, open source should come here.

The information required to do this is not confidential.

It's no secret.

Read this great New Yorker article about how Echo Boomers in Iraq, ages 19-25, used Internet chat rooms to teach each other how to work as a system administrator.

They said, "Al-Qaeda may be listening."

They said, "Jesus, they already know this."

(laughs) Please hold the present in your left hand.

Sunglasses that are simple and not intimidating.

Censorship and transparency, overhead comes both ways.

thank you.

So what does image have to do with it?

And I have to say, I think Emeka is trying to send a lot of subconscious messages because I'm going to keep picking up on some of the issues that are going on right now.

But I'm going to try to do something different and close the loop with some of my personal stories and try to tackle a lot of the issues we've been talking about head-on.

As you can see, Africa is a complex continent full of contradictions.

We are not alone.

(Laughter) (Applause) And you know, that's great.

In other words, we need an entire conference whose sole purpose is to tell good stories about this continent.

Think about it, do you understand?

And this is typically what we've been talking about, the role of the media in focusing only on the negative.

So why is that a problem?

A typical disaster story: disease, corruption, poverty.

And some of you may be standing here thinking, "Okay, Ollie, you're educated at Harvard, and all the privileged are here to say, 'Forget the poor.'"

Focus on your business, your market, or whatever. "And they all say, 'There are 80 percent of Africans who really need help.'

And I want to tell you that this is my story, okay?

And that's the story of many Africans here.

We start with poverty.

I didn't grow up in a slum or a miserable environment, but I know what it's like to grow up without money and without a family to support.

Yuvin was talking about signposts.

Breakfast was the difference between our family being broke or not.

You know, when things were good, there were eggs and sausages.

When I was sick, I ate porridge.

And like many African families, my parents were also supporting siblings and cousins ​​– my parents – so the situation was always precarious with no savings.

Well, when I was born they realized their kid was pretty smart and didn't want me to go to the neighborhood school that was free.

And they have adopted a very interesting approach to education. That was to get me to a school they could barely afford.

There they took me to a private Catholic elementary school, which laid the groundwork for my career.

And what happened is that sometimes they could afford it and other times they didn't, so almost every semester they kicked me out.

When someone came in with a list of people who weren't paying their tuition and I started getting pretty strict, I had to drop out until I could pay my tuition.

And I remember wondering why these people wouldn't take me to a cheap school.

Because we all know that kids are shy, sensitive, and have no money.

But they kept doing it, and I now understand why they did such a thing.

They talk about corruption.

In Kenya, there is an entrance exam to enter high school.

And then there are national schools, like the best schools, and rural schools.

At that time, my school of choice was a national Kenyan high school.

It fell short by one point.

So I was very disappointed and thought, "Oh my God, what am I going to do?"

Then my father said, "Okay, listen to me.

Let's go and talk to the principal.

You know, it's just one point. So if there's still room for it, she might let you in. ”

So we went to school, and because we were nothing, because we had no privileges, and my father didn't have the right last name, he was treated like dirt.

And I sat down and the principal said to him, who do you think you are?

Besides, it's a joke to think you can win a slot.

And I went to school with other girls. They were the children of politicians, they were doing much worse than I was, and they had a frame there.

And there is nothing worse than seeing a parent humiliated in front of you.

And then we left, and I swore to myself, 'I never have to beg for anything in my life.

I got a call two weeks later and I was like, 'Oh, you can come now. And I told them to pack it.

(Laughter) (Applause) Last but not least, I have to hurry.

disease.

The father I have been talking to died of AIDS in 1999.

He was so scared of stigma that he never told anyone he had AIDS.

And since I was a geek, I'm pretty much the one who figured it out.

I was in America at the time and they called me. The first time he got sick, he was very sick.

And I had cryptococcal meningitis.

So I googled "cryptococcal meningitis".

Due to the privilege of doctors and patients, they were unable to tell us what was really going on.

But they kind of felt like this was a long-term thing.

And when I went on the internet and looked up infectious diseases and read about this disease, I almost understood what was going on.

The first time he got sick, he recovered.

But what happened was that he had to take a drug called Diflucan, which was used for yeast infections in the United States at the time. The price of the drug was $30 a tablet.

He had to stay on the drug for the rest of his life.

That's how I ran out of money.

He got sick again.

And by that time, he had a friend who was traveling to India and was importing the generic version.

And that kept him going.

But I'm out of money.

He got sick again. He got sick on Friday.

At that time, there was only one bank in Kenya with an ATM, and cash was not available. The family didn't get the cash to start treatment for him until Monday.

At the hospital, he was put on an IV for three days.

And finally, we decided to take him to a public hospital.

At least he will get treatment while we figure out the money situation.

He died on the way to the hospital by ambulance.

And look, come on, imagine. If that's all you knew about me, you could go on and on.

how do you see me

Unfortunately, you know. sorrow.

And this is how we look at Africa.

This is the damage it causes.

You can't see the other side of me

No bloggers, no Harvard-educated lawyers, no exuberant people in sight.

And I just wanted to personalize it.

Because we talk about it in big words, and you wonder, yeah, so what?

But it is harmful.

And I'm not special, am I?

Imagine all you know about William is the fact that he grew up in a poor village.

You didn't know about windmills, did you?

And I was just blown away.

In fact, I cried during his presentation.

He felt that I would work hard to make it.

I thought Nike should hire him. "Just do it!"

(Laughter) And this is what I mean.

When we focus only on disasters -- (laughter) (applause) -- we ignore possibilities.

So what should we do?

First of all, African people, we need to do a better job of telling our stories.

I heard about it yesterday.

I received part of it this morning.

This is just one example, but a blog is one way to do that.

Afrigator is an African blog aggregator developed in South Africa.

So we need to start improving.

If no one else tells our story, let it.

Getting back to the point I was trying to make, this is Swahili Wikipedia.

Swahili is spoken by about 50 million people in East Africa.

Only 5 contributors.

Four of them are white males and non-native speakers.

The other - Ndesanjo, stand up if you're here - is Tanzanian and the first Swahili blogger.

He is the only African who has contributed to this.

Ladies and gentlemen, please. We cannot whine and complain that the West is doing this.

what are we doing?

Where are the rest of the Swahili speakers?

Why not generate your own content?

Complaining is not enough. we need to act.

Reuters is now integrating Africa blogs into its coverage of Africa.

This is the beginning and we hear about all their other efforts.

cheetah generation.

As you know, this help approach is flawed.

And even after the Live 8 hype, we still haven't appeared anywhere else in the world.

No, it's not.

(Laughter.) But what I'm trying to say is that criticizing is not enough.

And to those of you in the diaspora wondering where you should be, should you go back, should you stay here.

You know, just jump.

The continent needs you.

I can't stress it enough.

I am retired from one of Washington DC's top companies, Covington & Burling, with a six-figure annual salary.

Two paychecks, or three paychecks, can solve many family problems.

But I moved away from it because my passion was here and I wanted to do something fulfilling.

And because I'm needed here, you see?

Because of all that I do, I'll probably win an award that makes the most of my Harvard Law School degree.

One is that I'm pretty proactive and look for opportunities.

But is there such a need?

I work mostly as a corporate lawyer for Enablis, an organization that helps entrepreneurs in South Africa.

We are now expanding into East Africa.

And we offer them not only loans and equity financing, but also business development services.

I have also launched a project in Kenya to track the performance of Kenyan parliamentarians.

My partner, tech guru M, hacked WordPress.

Hosting alone costs $20/month.

Everything else there is a labor of love.

I manually entered all the data there.

You can also get a profile of each member of parliament, as well as parliamentary questions.

There is a comment function, and you can ask questions to lawmakers.

Some legislators participate and listen again.

Basically, we started this because we got sick of complaining about politicians.

You know, I believe accountability comes from demand.

We don't just take responsibility out of good faith.

And we Africans need to start challenging our leaders.

what are they doing?

As you know, they don't change suddenly.

So we need a new policy, where is it coming from?

Another thing is that these leaders are a reflection of our society.

We talk about African governments as if they fell from Mars.

they come from us.

And what in our society produces leaders we don't like?

And how can we change that?

So Muzarend was one of the little ways we thought we could inspire people to start holding leaders accountable.

Where do you go from here?

I believe in the power of ideas.

I believe in the power of sharing knowledge.

And I'm begging you guys, when you leave here, share the ideas you got from here and keep going. Because it can make a difference.

Another thing I would like to ask you to do is to take an interest in individuals.

I have had many conversations about what I think should happen in Africa.

People are like, "Okay, if I don't help, I'm a bleeding liberal, what can I do?"

And when I talk about my idea, they say, 'But it doesn't scale.

Please let me know what I can do with Paypal. ”

It's not that easy, right?

And sometimes just taking an interest in the individual, the people you meet, the business people you meet can make a big difference, especially in Africa. Because in Africa the individual usually has many people behind it.

especially. Because when I was a freshman in law school, my mother's business went bankrupt, so I was rooting for her.

My sister was having a hard time finishing her undergraduate degree.

I was helping her pay her school fees.

My cousin ran out of tuition and she's really smart.

I paid her school fees.

My cousin died of AIDS, leaving an orphan, and we said, "What are you going to do with her?"

As you know, she is my sister now.

And because of the opportunities that have been given to me, I can cheer up all those people.

So don't underestimate it.

example. This man changed my life.

he is a professor He's at Vanderbilt now.

He is Mitchell Seligson, an undergraduate professor.

And because of him, I was able to get into Harvard Law School. because he was interested.

I used to take his class and he was like, "This guy is an overzealous student. Everyone else is cynical and jaded, which usually doesn't happen in the US."

He called me into his office and said, "What do you want to do when you grow up?"

I said, "I want to be a lawyer."

And he said, "Why? America doesn't need lawyers anymore."

And he tried to persuade me to stop, but I was like, "Okay, I don't know anything about applying to law school. I have a Ph.D. in political science."

But think about what they want you to do and what they need to do to help you. ”

I was like, "Where do you want to go?"

And college for me at the time, I went to Pitts College during my undergraduate years, it was like heaven because compared to what might be in Kenya.

So I thought, "Yeah, I'm applying to Pitt's Law School."

He said, ``Why?

And I say, ``I like Pittsburgh because it's cheap here.''

It's the dumbest reason to apply to law school I've ever heard.

And, you know, he protected me and encouraged me.

And he said, "Look, you can get into Harvard, you're so good, you know?"

And if they don't recognize you, it's them who are screwed. ”

And he built me ​​up, you know?

And this is just an example.

You can meet other people here.

I just need a boost.

All I needed was a push to take me to the next level.

Basically, I would like to end with my vision for Africa.

A gentleman yesterday spoke of the humiliation of having to leave the continent to fulfill our potential.

As you know, my vision is that my daughter, and other African children born today, can be who they want to be here without ever leaving.

And they have the potential to transcend the environment in which they were born.

That's what you Americans take for granted, isn't it?

It's not a very good environment, but you can grow and move.

Just because you were born in rural Arkansas doesn't define who you are.

For most Africans today, where they live, where they were born, and the environment in which they were born determines the rest of their lives.

I want to see that change, and change starts with us.

And as Africans, we have a responsibility to our continent.

thank you.

(applause)

That is why people vehemently argue about the definition of life.

They ask whether we need reproduction in it, metabolism or evolution.

And I don't know the answer to that, so I'm not going to tell you.

It can be said that life requires calculation.

So it's a computer program.

Launching in a cell runs a program, which can result in this person. Or, with a little change, you could become someone like this. Or another small change, this person. Or a bigger change, this dog, this tree, or this whale.

Now, if you take the genome-as-program metaphor seriously, you have to think of Chris Anderson, like Jim Watson and Craig Venter, and all of us, as a computer artifact.

And to convince yourself that this metaphor is true, there are many similarities between genetic and computer programs that will help convince you.

But what fascinates me most is the unique sensitivity to small changes—artifacts—that can lead to large shifts in biological development.

A small mutation can turn 2 flies into 4 flies.

Alternatively, you can catch a fly and put your feet where the antennae should be.

Or, for those familiar with The Princess Bride, a six-fingered man might be born.

Now, it is precisely this sensitivity to small changes that characterizes computer programs.

If your bank account is $1 and you flip one bit, you could end up with $1,000.

So I think these small changes show us that the complex computations under development underlie these amplified big changes.

Now, all of this shows that there is a molecular program underlying biology, and it shows the power of molecular programming - biology does.

And what I want to do is write molecular programs to potentially build technology.

And there are a lot of people doing this, a lot of synthetic biologists like Craig Venter.

And they focus on cell utilization.

They are cell-oriented.

So my molecular programmer friend and I are taking a kind of biomolecule-centric approach.

We are interested in building new languages ​​for building things from the bottom up, using DNA, RNA, proteins, and potentially biomolecules that have nothing to do with biology.

So these are all machines in a cell.

I have a camera.

There are solar panels in your cells, some switches that turn genes on and off, beams in your cells, and motors that move your muscles.

My small group of molecular programmers are trying to reconstruct all these pieces from DNA.

We're not DNA enthusiasts, but DNA is the cheapest, easiest to understand, and most programmable material to do this.

And as others become easier to use (probably protein, etc.), we'll work with them.

If successful, what would molecular programming look like?

You will be sitting in front of your computer.

Design something like a mobile phone and describe it in high-level language.

The compiler that receives that description then converts it into actual molecules and sends them to the synthesizer, which packs those molecules into seeds.

And what happens when you water and feed those seeds properly is that they do developmental calculations, molecular calculations, and build electronic computers.

If I haven't revealed my prejudices yet, I think my life so far has been like molecular computers built electrochemical computers, electronic computers built, electrochemical computers built new molecular computers, electronic computers built new electronic computers, and so on.

And if you buy all this and, like me, think that life is a calculation, you're looking at the big problem through the eyes of a computer scientist.

One big question is how babies know when to stop growing.

For molecular programming, the question is how the cell phone knows when to stop growing.

(Laughter) Or how does a computer program know to stop running?

More to the point, how do we know if the program will stop?

I have other questions like this.

One of them is Craig Venter's question.

I think he's actually a computer scientist after all.

He asked what the smallest genome size would give a functioning microbe.

How many genes can I use?

This is a lot like the question, "What is the smallest program you can write that behaves exactly like Microsoft Word?"

(Laughter) Just like he wrote a miniaturizing bacterium and wrote a working genome, we could write a little program that does the same thing as Microsoft Word.

But for molecular programming, our question is, how many molecules do we need to put in that seed to get a cell phone?

What is the smallest number you can escape?

Well, these are the big questions in computer science.

These are all complex questions, and according to computer science, they are very difficult questions.

Most of them are impossible.

But for some tasks, you can start answering.

So we start asking these questions about the DNA structure we're going to talk about next.

So this is normal DNA, what you think normal DNA is.

It is double stranded, double helical, and has paired As, T, C, and G to hold the strand together.

Sometimes I draw like this so as not to scare you.

Instead of thinking about double helices, let's look at the individual strands.

When synthesized, it becomes single-stranded, so you can take the blue strand in one tube and make the orange strand in the other tube. If single-stranded, they will be fluffy.

When mixed together, they form a rigid double helix.

Over the past 25 years, Ned Seaman and many of his descendants have worked very hard to build beautiful three-dimensional structures using this type of reaction in which DNA strands come together.

But many of their approaches, though sophisticated, take a long time.

It can take years and can be difficult to design.

So a few years ago I came up with a new method called DNA origami. This is something you can easily do in your own kitchen and design on your laptop.

However, this requires long single-stranded DNA, which is technically very difficult to obtain.

So you can go to natural sources.

Looking at this computer-generated artifact, he has a double-stranded genome, which is no good.

Let's take a look inside his gut. Billions of bacteria exist.

They are no good either.

It becomes double-stranded again, but inside it is infected with a virus with a long, beautiful single-stranded genome that can be folded like paper.

And here's how.

This is part of its genome.

Add large amounts of short synthetic DNA that I call staples.

The left half of each long string is bundled in one place, and the right half is bundled in another place to form a long bundle like this.

The final act of many of these on that long strand is to fold it into something like a rectangle.

While you can't actually film this process on video, Sean Douglas from Harvard created a great visualization that starts with a long strand and has some short strands within it.

And what happens is you mix these threads together.

Heat them, add a little salt, heat to almost boiling, cool. As it cools, the shorter strands join the longer strands and begin to form a structure.

And you can see a bit of a double helix forming there.

If you look at DNA origami and think it's complicated, you'll see that it's actually a bunch of parallel double helices, held together by where the short strands run along one helix and jump to another.

So you have a chain that goes like this, joining along one helix, jumping to another helix and back.

Tie a long string like this.

Well, I made this shape to show you that you can make any shape or pattern.

I wanted to fold the DNA into something that goes up over the eyes, down the nose, up the nose, around the forehead, back down, and ends up with a little loop like this.

So I thought, if this works, maybe anything will work.

So we had a computer program design short staples to accomplish this.

i ordered them. They came by FedEx.

After mixing, heating, and cooling, 50 billion tiny smiley faces emerged in a single drop of water.

And each of these is only 1/1,000th the width of a human hair.

That is, they are all floating in solution, and in order to see them you have to put them on the surface they stick to.

So when you pour them onto a surface they start sticking to that surface and you take a picture using an atomic force microscope.

It has a stylus like a record stylus that goes back and forth across the surface, bumps up and down, and feels the height of the first surface.

Feel the origami of DNA.

With the atomic force microscope in motion, you can see that the landing is a little rough.

If you zoom in, their jaws are weak, their heads are flipped, and part of their nose is punched out, but it's pretty good.

If you zoom in you can even see the extra tiny loops, this tiny nano goatee.

Now, the great thing about this is that anyone can do this.

So about a year after doing this, I unsolicited received this in the mail.

Anyone know what this is? what is that?

China, right?

What happened there was a Chinese graduate student, Lulu Qiang, who did an amazing job.

She wrote the software to design and build this DNA origami all by herself. This is a beautiful representation of China, including even Taiwan, and you can see that this is kind of on the shortest chain in the world, right?

(Laughter) So this works really well and you can create patterns as well as shapes.

And you can map the Americas and spell out DNA in DNA.

And what's really great about this is, in fact, this all looks like nano-artwork, but you'll find that nano-artwork is exactly what you need to make a nanocircuit.

Circuit components such as light bulbs and light switches can therefore be attached to the staples.

Put it together and you'll get some kind of circuit.

And you could probably wash away the DNA and leave the circuit behind.

This is what some of my colleagues at Caltech have done.

They took a piece of DNA origami, put together some carbon nanotubes, built a little switch like you see here, wired it up and tested it to show that it really is a switch.

Okay, this is just one switch, but we need $500 million in computers, so we still have a long way to go.

However, this is very promising because origami allows you to assemble parts that are only a tenth the size of a regular computer.

Therefore, it is very promising for manufacturing small computers.

Now, let's get back to talking about compilers.

DNA origami is proof that the compiler actually works.

So you start doing something inside your computer.

You get a high level explanation of computer programs, a high level explanation of origami.

Compile it into a molecule, send it to the synthesizer, and it really works.

And it turns out that a company made a great program that was far better than my code (which was kind of ugly). This will allow you to do this in a nice visual, computer-aided design way.

So why isn't DNA origami the end of the story?

With a molecular compiler, you can do whatever you want.

The fact is that the scale does not match.

The problem is that if you want to make a human out of DNA origami, you'll need a long chain of 10 trillion bases.

We're not going to do this, because that's three light-years worth of DNA.

Here we turn to another technology called algorithmic self-assembly of tiles.

It was started by Erik Winfree and features tiles that are 1/100th the size of DNA origami.

If you zoom in, there are only four DNA strands, and they have tiny single-stranded bits that can bind to other tiles if they match.

And we prefer to draw these tiles as small squares.

And when you look at those sticky ends, these little bits of DNA, you can see that they actually form a checkerboard pattern.

These tiles thus create a complex self-assembling checkerboard.

In case you missed it, the point here is that tiles are a kind of molecular program that can output patterns.

And the really amazing thing about this is that you can turn any computer program into one of these tile programs (specifically counting).

So we can come up with a set of tiles that when combined form a small binary counter rather than a checkerboard.

So you can read the binary numbers 5, 6 and 7.

And to correctly start this kind of calculation, it needs some kind of input, the seed.

You can use DNA origami for that.

If you encode the number 32 on the right side of the DNA origami, add countable tiles and it will start counting. That is, it reads 32 and stops at 32.

So what we did was find a way to tell the molecular program when to stop.

I know when to stop growing because I can count.

You can see how big it is.

Now you have the answer to the first question I was talking about.

I don't know how babies do that though.

So with this count, we can now try to do much more than DNA origami could otherwise do.

This is DNA origami. You can write 32 on both ends of the DNA origami. You can use watering cans and water in tiles and grow tiles out of it to create squares.

The counter acts as a template for filling the middle rectangle of this thing.

So what we did is we combined DNA origami and tiles and succeeded in making something much bigger than DNA origami.

And the great thing about it is that it's reprogrammable.

By simply changing a few of the DNA strands in this binary representation, we get 96 instead of 32.

If you do this, the origami will be the same size, but the resulting square will be 3 times larger.

This is a summary of what I said about development.

You have a very delicate computer program, and a small change, a single, small, small mutation, can make one big thing even bigger.

Now, this is about using counts to calculate or build this kind of thing by this kind of developmental process, which is also relevant to Craig Venter's question.

Now we can ask how many DNA strands are needed to build a square of a given size.

If you want to make squares of size 10, 100, or 1,000, using DNA origami alone, you need as many DNA strands as the size of the square squared. Therefore, you would need 100, 10,000, or 1 million DNA strands.

It's not really affordable.

But with a little math (using origami and some counted tiles) you can get around it by using 100, 200 or 300 DNA strands.

Therefore, counting numbers and using a little math can exponentially reduce the number of DNA strands used.

Computation is therefore a very powerful way to reduce the number of molecules needed to build something and reduce the size of the genome we are building.

And finally, back to the kind of crazy idea that computers build computers.

When you look at the origami square and some counters growing out of it, the pattern is exactly what you need to create memories.

So sticking a few wires and switches to these tiles (not staple strands, but to the tiles) will self-assemble the somewhat complicated circuit needed to access this memory: the demultiplexer circuit.

So you can actually create complex circuits using a little math.

It is a molecular computer that builds an electronic computer.

Now you ask me, how far have we gone on this road?

Experimentally, this is what we did last year.

This is a DNA origami rectangle with some tiles extending from it.

And you'll see how they count.

1、2、3、4、5、6、9、10、11、12、17。

So at least it's counted up, albeit with some error.

(Laughter) So it turns out that this idea was actually nine years old. That's about the same time constant as how long it takes to do this sort of thing, so I'd say there's been quite a bit of progress.

I have an idea on how to fix these errors.

And I think in the next five or ten years we'll have squares like the one I described, and maybe we'll get to some self-organizing circuits.

So what do we want you to get out of this story?

I want you to remember that life uses computation to create the very diverse and complex forms of life.

And the calculations it uses are molecular calculations, and as Feynman said, to understand and better handle this, we need to build something to understand it.

So we're going to rebuild this using molecules, using DNA in ways nature didn't intend it, using DNA origami, using DNA origami to seed this algorithmic self-assembly, and rebuilding everything bottom-up.

You know, this is all pretty cool, but what I want you to understand from this talk, and hopefully some of these big questions, is that this molecular programming is more than just creating gadgets.

It's not just building, it's building self-assembled cell phones and circuits.

What that really means is taking computer science and trying to look at the big problems in new light, ask new versions of those big questions, and try to understand how biology can produce such amazing things. thank you.

(applause)

I'll try to explain why perhaps we don't understand as much as we think.

I would like to start with four questions.

This is not a cultural thing at this time.

By the way, it's an inside joke.

But these four questions are actually very difficult questions, even for those who know a lot about science.

These are the questions I asked science television producers and science educator viewers: science teachers, and 7-year-olds, and found that 7-year-olds performed slightly better than other viewers. This is a little surprising.

As for the first question, you might want to write this down physically on paper or on a virtual piece of paper in your head. People watching at home can also try this.

Small seeds weigh very little, but trees are very heavy, right?

I think we would agree on that. Where did the wood come from for the materials that make up this chair? Where did this stuff come from?

(Knocks) And the next question is, can you light a small flashlight with a battery, a light bulb, and a single wire?

And can you draw some kind of diagram? You don't have to draw diagrams, but if you have to, can you draw diagrams? Or do you think it's really not possible?

A third question is why is summer hotter than winter?

I think we can probably agree that summers are hotter than winters, but why? And finally, could you scribble out a floor plan of the solar system showing the shape of the orbits of the planets?

Can you do it?

If possible, scribble patterns.

OK. Now, children do not get their ideas from their teachers, as teachers often think, but actually from common sense, their experience of the world around them, and everything that happens between them and their peers, caregivers, and parents. experience.

And one of the great experts in this field, fortunately, of course, was Cardinal Wolsey. It's virtually impossible to change what's in people's minds, so be very careful.

(Laughter.) Actually, I don't really know how he died.

Was he eventually decapitated or hanged?

(Laughter) Well, these questions, of course, you are right, but you are not negotiating, and so on.

And I—you know, normally I would pick people out and humiliate them, but maybe not in this case.

The little seed weighs a lot, and basically all this stuff, 99 percent of this stuff, came out of the air.

Now, about 85 percent of you, or maybe less at TED, will answer that it comes out of the ground. And some people will argue with me later, but I would say that it's actually something that comes out of the ground.

If that were true, there would be trucks all over the country filling people's gardens with dirt. It would be great business.

But we don't actually do that.

This lump comes out of the air.

Well, I passed all the biology exams I took in England.

I passed very well, but I still walked out of school thinking it came out of the ground.

Second: Can you light a small flashlight with a light bulb and one wire?

Yes, I can. I'll show you how to do that later.

Well, I have some bad news for you. I had a video and was going to show it to you, but unfortunately there is no sound in this room. So I'm going to try to explain what's going on in the video in a very "Monty Python" way. And in the video, a group of researchers go to MIT on Commencement Day.

We chose MIT because it's obviously so far from here that you wouldn't care too much, but it works just as well in the UK as it does on the west coast of the US.

And we asked them these questions, and we asked science graduates these questions, and they couldn't answer it.

So a lot of people are saying, 'I would be very surprised if you told me this came out of nowhere.

That's a big surprise to me. ’ And they are science graduates.

And then, out of British-like arrogance, we nip it in: "We are the best scientific university in the world."

(Laughter) And when I asked a graduate engineer that question, they said it wasn't possible.

And when we gave them batteries and wires and light bulbs and asked them, "Can you do it?" right?

It's no different than Imperial College in London. By the way, this is not some kind of anti-American thing going on.

As if. Now, the reason this is important is because we pay a lot of money to teach people. We'd better get it right.

And there are some social reasons why we want people to understand what's going on in photosynthesis. For example, half of the carbon equation is how much we emit, and the other half of the carbon equation, which I am very conscious of as Kew's trustee, is how much carbon dioxide an object absorbs from the atmosphere.

That's what plants actually do for a living.

And for the Finns in the audience, this is a Finnish pun. Without that understanding, we are literally and figuratively skating on thin ice.

Now, how to make a battery and a light bulb.

It's very easy, isn't it? Of course, you all knew that.

But if you've never played with batteries or light bulbs, if you've only seen schematics, you may not be able to do that, and that's one of the problems.

So why is summer hotter than winter?

As children, we learn to get burned when we get close to something hot. This is a very powerful learning and it happens pretty early on.

Moreover, we think that summer must be hotter than winter because it is closer to the sun.

I promise most of you understand that.

Oh, everyone is shaking their heads, but only a few are shaking their heads firmly.

Others go like this. have understood.

Summers are hotter than winters because the tilt of the earth spreads the light from the sun over a wider area.

And if you think that incline is bringing us closer, no, it isn't.

The sun is 93 million miles away, but we're tilted like this, right?

It holds no promise. In fact, in the Northern Hemisphere, it moves farther from the Sun in summer, and that's no wonder. There is a difference.

Well, here's a drawing of the solar system.

If you believe, as most people probably do, that summers are hotter than winters because they are closer to the sun, you must have drawn an ellipse.

right? Does that explain?

But have you - you're nodding your head - now in your ellipse, "So what happens during the night?"

Between Australia and here, yes Australia has summer and we have winter. And does the Earth rush towards the Sun at night and then rush again?

Here is Copernicus' view of what the solar system might look like as a plan.

That's pretty much what should be on paper. right?

And this is NASA's view. surprisingly similar.

I hope you noticed the coincidence here.

What do you do when you find out that people have misconceptions about elliptical orbits because of your childhood experiences?

What diagram of the solar system would you show to show that this is not the case?

Are you going to show them something like this?

This is a plan looking down from above.

But no, look what you find in textbooks.

That's what you show people, right? These are from textbooks, websites, educational websites, and pretty much anything you pick up is like that.

The reason for this is that lots of concentric circles are quite boring, but it's much more interesting to see something at that angle, isn't it? right? And if you do it at that angle, the 2D representation of something in 3D will be an ellipse if you have such a misconception in your head.

I mean, it's really shitty, right? You are right.

So these mental models -- we look for evidence that reinforces them.

Of course, we do this with race, politics, and everything else, and so does science. So we just look and scientists are doing it all the time. We are looking for evidence to support our model. And some are competent and willing to provide evidence to support the model.

So, since I'm in America, I'll try to find out about Europeans.

These are examples of bad practices in science education centers. These photos are from the Welcome Wing of the Science Museum in La Villette, France and London.

And when you look at the way these things are built, there's a lot of glass mediation, very blue, kind of professional. I mean, that scene in "Annie Hall" where Woody Allen came out from under the sheets and said, "Oh my god, so professional." And you're not -- there's no passion there, and it's not practical, yes, and you know, it's meant to be a joke. A good interpretation is the nearby San Francisco Exploratorium. Here everything is made from everyday objects that children can understand, including demonstrations, and is very hands-on, allowing children to participate and experiment.

And I know that graduates from MIT and Imperial College in London had batteries and wires and a bit of stuff, and if they could, they would have learned how it actually worked, instead of following the schematics and thinking they couldn't.

I mean, a good interpretation is about stuffed stuff and my world, right?

And one that all looks great, with no extra barriers of glass shards or machined titanium.

And Exploratorium does it really well.

And although I'm an amateur, I'm an amateur in a good sense, that is, the origin of the word is love and passion.

So children are not empty vessels?

So, as "Monty Python" puts it, it's like the Lord of the Secrets saying, but this is that children are not empty vessels.

They have their own ideas, their own theories, and if you don't work on them, you can't change them, right? And I probably haven't changed your thinking about how the world and universe work.

But this is equally true when trying to sell new technology.

For example, the UK is trying to switch its entire population to digital technology (for television).

And one of the hard things is when people have preconceptions about how everything works, it's very hard to change.

We are not empty vessels. The mental models we have as children persist into adulthood.

Poor teaching actually does more harm than good.

In this country and England, magnetism is better understood before school than before.

It's the same with gravity, it's a very humbling thing because there are two concepts, and you know, when you're a teacher, when you look at the before and after, it's very worrying. Poor test scores after teaching.

And we collude. We design our tests so that people can pass them, at least in the UK. right?

And the government is doing very well. They pat themselves on the back.

OK? We are colluding, and indeed, if you had designed a test for me when I was taking an exam in biology to really understand if someone understood more than mixing starch with iodine to make it green, and really understood that plants take mass out of the air, then I might have done better in science.

So the most important thing is to get people to explain the model clearly.

Your homework is how an airplane wing creates lift.

Obvious question. I have the answer in my head right away.

The second question is, have we always explained how an airplane can fly upside down?

Oh yeah. The second question is why is the sea blue? have understood?

And you all have an idea of ​​the answer in your head.

So why are cloudy days blue? Oh look.

(Laughter) I've always wanted to say that in this country.

(Laughter) Finally, my request to you is to allow yourself, your children, and people you know to mess with things. Because, as you know, tinkering with something can complement other learning. It's not a replacement, it's the learning part that counts.

thank you very much.

Now -- oh yeah, go ahead.

(applause)

Stephanie White: Have her introduce herself to everyone.

Can you tell everyone your name?

Einstein: Einstein.

SW: Einstein. Can you say hello to everyone?

E: Hello.

SW: That sounds good. Can you be polite?

E: Hello sweetheart.

SW: Much better.

Einstein is very honored to be at TED 2006 with all of you Einsteins of today.

E: Hmm.

(Laughter) Since we arrived, there's been a lot of talk about all the exciting speakers at this conference.

There have been many whispers this morning about Tom O'Reilly's roundup on Saturday.

Einstein, did you hear a whisper?

E: [Squawk] SW: Yeah.

(Laughter) Einstein is particularly interested in Penelope's story.

A lot of her research is just in case and can get pretty dusty.

E: Look!

SW: It might make her sneeze.

But more importantly, her research could help Einstein find a cure for her constantly scratching throat.

Einstein: [coughing] SW: Oh.

(Laughter) Well, Bob Russell was talking to us about studying nanotubes in microscopic studies.

Well, that would be really cool, but what Einstein really wanted was maybe he could genetically engineer five pounds of peanuts.

E: Whoa! my god! my god!

SW: Right. she will be really excited.

(Laughter) It's one big peanut.

Einstein is a bird, so he is very interested in things that fly.

She finds Burt Rutan very impressive.

E: Oh.

SW: Right. She especially likes his latest work, SpaceShipOne.

Einstein, would you like to board Bart's spaceship?

E: [Spacecraft noise] SW: Without lasers?

E: [laser noise] (laughter) SW: Yeah, yeah. It was a lot of fun, Einstein.

Now, Einstein also thought that working in caves and traveling in space were all very dangerous jobs.

It is very dangerous if you fall.

E: Wow! [Splat] SW: Right.

(Laughter) There was a little splat at the end. Einstein, did it hurt?

E: Oh, oh, oh.

SW: Right. All of them are hard work.

E: [Squawk] SW: Yeah. It can irritate birds like Einstein.

E: [Squawk] SW: Yes, it certainly is possible.

But Einstein loved to enjoy art when he needed to relax from the work of educating the masses.

If Ugandan children need another dance partner, Einstein, who loves to dance, would fit the bill.

Can you get off?

E: [shakes head] (laughter) SW: Let's get down for everyone. Come on, come on.

She will make me do it too. oh oh

Einstein: Oh, oh, oh, oh.

SW: Go ahead and do your best.

E: Oh, oh, oh, oh, oh

(laughter) SW: Or maybe Sirena Huang wants to learn some arias on the violin and Einstein can sing along to the opera?

E: [Screaming like an opera] SW: Very good.

(laughs) Or does Stu just need another backing singer?

Einstein, can you sing too?

I know, I need to remove the seed first. can you sing

E: There, there.

SW: Yes, please.

And of course, when all else fails, you can just run away and enjoy the merry festivities.

E: [barking] SW: Okay.

Well, Einstein was pretty embarrassed to admit this before, but she said she had a problem with me behind the scenes.

E: What's wrong?

SW: No, no problem. you have a problem, remember?

Did I say I'm really embarrassed because I'm in love with a pirate?

E: Son.

SW: Let's go. And what do pirates like to drink?

E: Beer.

SW: Yes, that's right.

you like to drink water

E: [Sound of water] SW: Very good. Now, actually, she's pretty nervous.

Because her favorite person is here from home and she's very nervous to meet him.

She thinks Al Gore is a really handsome man.

What do you say to a handsome man?

E: Hi baby.

(Laughter) SW: So do all the people from my hometown in Tennessee.

E: Hi.

(laughs) SW: She's such a big fan that she knows his birthday is coming up at the end of March.

I didn't think he was in town at the time, so Einstein wanted to do something special for him.

So let's see if Einstein sings "Happy Birthday" to Al Gore.

Can you sing "Happy Birthday" to him?

E: Happy birthday!

SW: Again.

E: Happy birthday!

SW: Again.

E: Happy birthday!

SW: Great finish.

E: Happy birthday!

SW: Good job!

(Applause.) Now, before wrapping up, she wants to send a shout out to all her animal friends at the Knoxville Zoo.

Einstein, would you like to say hello to all the owls?

E: Woo, woo, woo.

SW: What about other birds?

E: Tweet, tweet, tweet.

SW: Penguin?

E: Quack, quack, quack.

SW: Let's go.

(Laughter) Let's get it out of there. What about chimpanzees?

E: Oh, oh, oh. Oh, oh, oh

SW: Very good.

(Laughter) What about wolves?

E: Wow.

SW: And what about pigs?

E: Oink, Oink, Oink.

SW: What about roosters?

E: Cocco a doodle doo!

SW: So what about those cats?

E: Meow.

(Laughter) SW: We have big cats in the zoo that come from the jungle.

E: Hmm, hmm.

(laughter) SW: What about skunks?

E: It stinks.

(laughs) SW: She's a comedian. Think you're famous? Are you famous?

E: Superstar.

SW: Right. you are a superstar

(Laughter) Well, we would like to encourage all of you to do your part to protect the animals of Einstein's friends, and to do your part to protect the homes they live in.

Well, Einstein says best when we ask her.

Why do we want to protect your home?

E: I'm special.

SW: You are a very special person.

E: I love you.

SW: That sounds good. can you kiss them?

E: [Kissing sound] SW: So what do you say when it's time to leave?

E: Goodbye.

SW: Good. Thank you everyone.

(applause)

My life mission since childhood has been and still is to take the rest of us into space.

It is in our lifetime that we take the earth, we take the people of the earth, and we transition forever. It's very exciting.

In fact, I consider it a moral imperative to explore the frontiers of space.

As you know, this is the first time we have a chance to get planetary redundancy, a chance to back up the biosphere so to speak.

And if you think about the universe, there is an infinite amount of everything that we have value on earth, such as metals and minerals, real estate and energy.

In fact, the earth is like supermarket crumbs packed with resources.

My analogy is Alaska. As you know, we bought Alaska.

We Americans purchased Alaska in the 1850s. It's called Seward's stupidity.

We rated it as the number of seal pelts we could kill.

And then we discovered gold, oil, fisheries, timber, you know, a trillion dollar economy and now we go on our honeymoon there. The same thing will happen in space.

We are now on the brink of the greatest expedition in human history.

We explore three reasons, the weakest of which is curiosity.

As you know, NASA's budget has been provided so far.

Some images of Mars in 1997.

In fact, within the next ten years, no doubt, we will discover life on Mars and find it literally ubiquitous in Martian soil and elsewhere.

The stronger motive, the stronger motive, is fear.

It drove us to the moon. We literally raced to the moon with the USSR in terror. And we have these giant rocks, you know, there are hundreds of thousands, millions of killer-sized rocks. The odds are so small, but the literally calculated impact of one of these rocks hitting Earth is so great that it wouldn't be unreasonable to spend a fraction of it researching, searching, and preparing defenses.

And, of course, a third motivation that is close and dear to my heart as an entrepreneur is wealth.

In fact, maximum wealth. Think about these other asteroids, there's the nickel-iron class, and if you can get your hands on these stones, the platinum group metals market alone is worth about $20 trillion.

My plan is to actually buy a put in the precious metals market and claim to actually go for the put.

And that will fund the actual mission to get it.

But fear, curiosity and greed drive us.

And for me, this is - I'm the short kid on the right.

This was actually my motivation at the time of Apollo.

And Apollo was one of the greatest motivators ever.

Consider what happened on May 25th in the early 1960s, JFK said, "We're going to the moon."

And people quit their jobs and went to secluded places to participate in this great mission.

And we knew nothing about going to space.

It literally took us eight years from suborbital Alan Shepard to go to the moon, but the average age of those who got there was 26.

They didn't know what they couldn't do.

They had to make up the whole thing.

And that's great motivation.

This is my good friend Gene Cernan. "If we go to the moon" - this is the last human being to reach the moon at this time - "nothing is impossible."

But my point here is that the government is not going to take us there.

Governments cannot take the risks necessary to explore this precious frontier.

Launching the shuttle will cost $1 billion.

It's a pathetic number. It's absurd.

We should not be content to endorse it.

One of the things we did with the Ansari X PRIZE was to challenge ourselves to be willing to take risks.

When we go out and try new ground, we should be allowed to take risks.

In fact, anyone who says we shouldn't, you know, should be set aside. Because as we move forward, in fact, the greatest discovery we will ever know is ahead of us.

Space business entrepreneurs are furry mammals, and the military-industrial complex, which includes Boeing, Lockheed, and NASA, is decidedly a dinosaur.

Being able to access these resources and gain terrestrial redundancy allows us to collect all the information, the genetic code, you know, everything that is stored in databases, and backup them off-planet in case those dire situations happen.

The hard part is getting there, and obviously the cost to get going is key.

Once in orbit, it's energetically two-thirds as far as it could go to the Moon, Mars, or anywhere else. And right now, there are only three vehicles that can go there: the US Shuttle, the Russian Soyuz, and the Chinese.

Supposedly, the space shuttle costs about $100 million per passenger.

Space Adventures, one of the companies I started, will sell tickets.

I've done two so far. It plans to announce two more people on board the Soyuz, which will go to the space station for $20 million.

But it's expensive, and to understand what the potential is -- (laughter) -- it's expensive. But people are willing to pay for it!

As you know, we are in a very unique time today.

For the first time in history, we have enough wealth concentrated in the hands of a few individuals to have access to technology that can actually drive space exploration.

But how much cheaper? I would like to give you an ending point.

We know - at $20 million right now, you can go buy a ticket, but how cheap will it be?

Now let's go back to high school physics.

Recall that calculating the amount of potential energy (mgh) to move you and your spacesuit hundreds of miles and then accelerate to 17,500 miles per hour is MV squared squared.

That's about 5.7 gigajoules of energy.

Consuming this over an hour equates to about 1.6 megawatts.

Let's say you go to one of Vijay's micro power supplies and they sell it for 7 cents per kilowatt hour. Anyone here quick with math?

How much does it cost to get you and your spacesuit into orbit?

$100. That is the price improvement curve. It takes a breakthrough in physics in the process, which I'll admit.

(Laughter) But folks, if history has taught us anything, it's that if you can imagine it, you can get there in the end.

I have no doubt that the physics and engineering are just around the corner to get us all into orbital spaceflight.

The difficulty is that you need a real market to drive investment.

Boeing and Lockheed currently do not spend a single dollar of their own money on research and development.

It's all government research funding, and a tiny fraction of that.

And really, big companies and governments can't take risks.

So we need what I call exothermic economic reactions in space.

Today's global commercial market, global commercial launch market?

It is launched 12 to 15 times a year.

How many commercial companies are there? About 12-15.

One per company. That's not it. There is only one marketplace and I call them self-loading carbon payloads.

They come with their own money. Easy to make.

it's people. The Ansari X Prize was my solution after reading an article about Lindbergh creating a vehicle to get us there.

We provided $10 million in cash for the first reusable vessel, which would carry three people up to 100 kilometers, descend and sail again within two weeks.

Twenty-six teams from seven countries participated, spending between $1 million and $25 million each.

And, of course, we have the beautiful SpaceShipOne, which successfully flew those two and won the competition.

And I want to watch a little video and take you to the place that morning.

(Video) Pilot: Please release the fire.

Richard Serfoss: Good luck.

(Applause) RS: The altitude is 368,000 feet.

(Applause) RS: So, in my official position as head of the Ansari X PRIZE contest jury, I declare that Mojave Aerospace Ventures did indeed win the Ansari X PRIZE.

(Applause.) Peter Diamandis: Probably the hardest thing I had to do was raise money for this. It was literally impossible.

We visited 100, 200 CEOs and CMOs.

No one believed it was done. Everyone was like, "Oh, what does NASA think?"

Well, a person will die one day, so how can you bring it to the fore? ”

I found a visionary family, the Ansari family, and Champ Car, and raised some of the money, but not the full 10 million.

And what I ended up doing was going into the insurance industry and buying hole-in-one insurance.

You see, an insurance company visited Boeing and Lockheed and said, "Are you going to compete?" no.

"Are you going to compete?" No, "No one will win at this."

So they made a bet that no one would win by January of 2005, and I bet someone would win.

(Applause.) So, and the best part, they were rewarded and the check wasn't bounced.

(Laughter) We did a lot and we were very successful.

One of the things I'm most excited about is that SpaceShipOne will be on display at the Air and Space Museum next to the Spirit of St. Louis and Wright Flyer.

Isn't that great? (Applause.) So let's talk a little bit about the future, stepping into space, and what's available to you.

Today you can experience weightless flight.

By 2008, the cost of suborbital flight, as you know, will be around $200,000 for Virgin.

I think there are three or four other serious initiatives that will bring the price of suborbital flight down to about $25,000 very quickly.

Orbital Flight -- We take you to the space station.

And I truly believe that once a group is in orbit around the Earth—even if they don't, I know—we'll stockpile fuel, make the closest approach to the Moon, and get real estate.

(Laughter) Just a moment for the designers in the audience.

We spent 11 years getting approval from the FAA for zero-gravity flight.

Here are some fun images. Here is Burt Rutan and my best friend Greg Melonek in zero gravity. People think it's a zero gravity room, but there's a switch there to turn it off. But really, it's a parabolic flight of an airplane.

And it turns out that 7-Up just produced a small commercial that will air this month.

What if you raised your voice?

(Video) Narrator: Look for specially marked Diet 7-Up packages for your chance to win your first free ticket to space.

If you want a taste that is not heavy, you have to go up.

PD: It was filmed on our plane and now we can do this.

We are based in Florida.

Let's talk about another thing I'm excited about.

The future of prizes. As you know, prizes are a very old idea.

It was an honor to borrow from the Longitude and Ortaig Awards that pushed Lindbergh.

And we at the X PRIZE Foundation have decided to actually push that concept into other areas of technology, with a new mission statement: "bringing fundamental breakthroughs in space and other technologies for the benefit of mankind."

And this is what we are very excited about.

I showed this slide to Larry Page, who had just joined the board.

Donating to a non-profit organization can be 50 cents on every dollar.

If there are matching grants, it is usually 2 to 3 to 1.

You literally get 50:1 leverage in dollars when you list prizes.

That's a big deal. And he turned around and said: “If you support an award-giving agency that runs 10 awards, you get 500 to 1.”

I said, "Well, that's great."

So, we are really looking to transform X PRIZE into a world-class awards provider.

This is what happens when you list a prize, announce it, and when teams start trials.

Publicity increases, and winning a championship can boost publicity, but that's part of the benefit for the sponsor if it's managed properly.

And after the prize is actually won and it is put into motion, there are social benefits such as new technology and new abilities.

And the profit for the sponsor is the sum of the long-term publicity effect and the social benefit.

That's our value proposition in prizes.

Any attempt to develop SpaceShipOne or any other new technology must be funded from the beginning and maintained with that funding with uncertain outcomes.

It may or may not happen. But when you list prizes, the great thing is that it's a very small upkeep fee that you pay if you're successful.

Orteig didn't pay the nine teams that tried to cross the Atlantic a penny, and we didn't pay a penny until someone won the Ansari X Prize.

So the prize is very effective.

Every innovator and entrepreneur in the world knows that the first thing you have to do when moving towards your goals is to believe that you can do it too.

Then, you know, you have to face the potential public ridicule of "that's a crazy idea, it's never going to work."

And then you have to convince other people to actually help you with the fundraising. And we also have to deal with the fact that there are government bureaucracies and agencies that don't want these things going, and we have to deal with failures. What the prize does, what we experience with what the prize does, literally helps short-circuit or support all of these things. Because the prize is proof of the idea that this is a good idea.

Well, it must be a good idea.

Someone is offering $10 million to do this thing.

And each of these areas turned out to be Ansari X PRIZE to help them shorten and innovate.

So, as an organization, we're looking at coming up with prizes, putting together a prize discovery process on how to create rules, and actually creating prizes in different categories.

We focus on attacks on energy, the environment and nanotechnology. We'll talk more about these later.

And the way we do it is creating prize teams within X PRIZE. We have a space award team.

We are aiming for an orbital prize.

We are considering many energy awards.

Craig Venter has just joined our board and we are working with him to organize the Rapid Genome Sequencing Awards. It will be announced later this fall. Imagine revolutionizing medicine by being able to sequence anyone's DNA for less than $1,000.

And we're looking at clean water, education, healthcare, and even social entrepreneurship.

My final slide is the most important tool for solving humanity's grandest challenges. It's not technology or money. It's just one. It is a devoted and passionate human heart.

(applause)

Now, Hegel, he very famously said that Africa is a place with no history, no past, no stories.

But I would argue that no other continent has so much nurtured, fought and celebrated its history.

The struggle to keep African stories alive has been and continues to be one of the most consistent and hard-working efforts of African peoples.

The struggles endured in the face of enslavement, colonialism, racism, war, and the sacrifices made to sustain the narrative have underpinned the narrative of our history.

And our stories have not only survived the attacks that history has thrown at them.

We have left behind a series of material culture, artistic authority and intellectual achievements.

We have mapped, charted, and recorded history in the same way we do elsewhere on Earth.

Long before the arrival of any Europeans of any significance, indeed, when Europe was still in its Dark Ages, Africans were using pioneering techniques in the cultivation of records and history to create revolutionary ways to keep their stories alive.

And a living history, a dynamic heritage, it remains important to us.

We see it manifest in many ways.

I recall that just last year, the first members of the al-Qaeda-affiliated Ansar Dine were indicted for war crimes and sent to The Hague.

And one of the most notorious is Ahmad al-Faki, a young Malian who has been accused not of genocide or ethnic cleansing, but of one of the instigators of a campaign to destroy some of Mali's most important cultural heritage.

This was not vandalism. These were no flippant acts.

When asked to identify himself in court, one of the things al-Faqi said was that he was a graduate and a teacher.

Throughout 2012, they engaged in a coordinated campaign to destroy Mali's cultural heritage.

This was a deep thought about waging war in the most powerful way imaginable: destroying stories, destroying stories.

Attempting to destroy nine shrines, a central mosque, and perhaps as many as 4,000 manuscripts was a considered act.

They understood the power of stories to bring communities together, and they also understood that by destroying stories they wanted to destroy people.

But just as Ansar Dain and his rebellion were driven by powerful narratives, so was the defense of Timbuktu and its library by the local population.

These were communities that grew up with the story of the Mali Empire. They lived in the shadow of Timbuktu's great library.

They've been listening to this song's origins since they were kids, but they weren't going to give it up without a fight.

During the difficult months of 2012, during the Ansar Dine invasion, Malian civilians risked their lives to keep documents secret, smuggle them to safety, protect historic buildings, and do everything they could to protect ancient libraries.

And although not always successful, many of the most important manuscripts have been thankfully preserved, and each of the shrines damaged in the uprising is now being rebuilt, including the city's iconic 14th-century mosque.

Fully restored.

But even during the most dire times of the occupation, enough of Timbuktu's inhabitants did not bow to men like al-Faki.

They will not allow their history to be erased. Anyone who has visited that part of the world will understand why stories, why stories, why history is so important.

History is important.

History is really important.

And for people of African descent who have seen their stories systematically attacked over the centuries, this is very important.

This is part of a recurring echo in our history of ordinary people taking a stand for their stories and histories.

As in the 19th century, enslaved Africans in the Caribbean fought under the threat of punishment, practiced their religion, celebrated carnivals, and fought to keep history alive.

Ordinary people were ready to make great, sometimes ultimate, sacrifices for their history.

And it was through narrative control that some of the most devastating colonial campaigns materialized.

It was by one story dominating another that the worst manifestations of colonialism became apparent.

When the British attacked the Ashanti in 1874, they overran Kumasi and occupied the Assantehene.

They knew that it was not enough to rule a territory and conquer a head of state.

They recognized that the nation's emotional authority lay in its story and the symbols that represented it, such as the golden chair.

They understood that story control was absolutely critical to truly controlling people.

And the Ashanti understood it too, they never parted with their precious golden chair, never surrendered completely to the British.

Story is important.

In 1871, German geologist Karl Mauch, working in southern Africa, encountered an unusual complex of abandoned stone buildings.

And he never fully recovered from what he saw. It was Great Zimbabwe, a dry stone city of granite, stranded on an outcrop above empty savannah.

And although Mauch had no idea who was responsible for what was clearly an amazing feat of architecture, he was sure of one thing. That said, this story needs to be claimed.

He later wrote that the elaborate architecture of Great Zimbabwe was too sophisticated and too special for Africans to build.

Mauch speculated who built the city, as did dozens of Europeans who followed in his footsteps.

And one person went so far as to say, "I don't think I'm so wrong in assuming that those ruins on the hill are copies of King Solomon's temple."

And as you know, Mauf, what he stumbled across was not King Solomon's temple, but pure African buildings built by pure African civilizations from the 11th century onwards.

But like fellow German anthropologist Leo Frobenius, when he first saw Nigeria's Ife heads a few years later, he speculated that they must be relics of the long-lost kingdom of Atlantis.

Like Hegel, he felt an almost instinctive need to deprive Africa of its history.

These ideas were so irrational and so deeply ingrained that they were unable to think rationally in the face of physical archeology.

they could no longer see.

And, like much of Africa's relationship with Enlightenment Europe, it involved the appropriation, slander, and domination of the African continent.

It included an attempt to bend the narrative to suit European purposes.

And if Mauch really wanted to find an answer to his question, "Where did the Great Zimbabwe, or that great stone building, come from?"

He would have had to begin his quest a thousand miles from Great Zimbabwe, at the eastern tip of the continent where Africa and the Indian Ocean meet.

He would have had to trace gold and goods from some of the great trading empires on the Swahili coast to Great Zimbabwe, to feel the scale and influence of that mystical culture, and to get a complete picture of Great Zimbabwe as a political and cultural entity through the kingdoms and civilizations under their control.

For centuries, merchants from as far afield as India, China and the Middle East have been drawn to parts of this coast.

And the building is so beautiful that one might be tempted to interpret it as merely an elaborate symbolic jewel, a giant ceremonial stone carving.

But this place must have been a complex at the center of the vital links of the economy that have defined the area for thousands of years.

This is important.

These stories matter.

Even today, time is not the only race to tell our stories.

And it's not just against organizations like Ansar Dine.

It is also about establishing a true African voice after centuries of imposed history.

We must not only recolonize history, but find a way to reclaim the intellectual foundations that Hegel denied existed at all.

We need to rediscover African philosophy, African perspective, and African history.

The Great Zimbabwe Blooms -- It was not an extraordinary moment.

It was part of a rapidly advancing change across the continent.

Perhaps a great example of this was Sundiata Keita, founder of the Mali Empire, arguably the largest empire in West African history.

Sundiata Keita was born around 1235 and grew up in a time of great change.

He saw the transformation of the Berber dynasty in the north, the rise of the Ife dynasty in the south, and perhaps even the Solomian rule in Ethiopia in the east.

And he must have realized that he was living in a moment of rapid change and growing confidence in the continent.

He must have recognized that emerging powers growing in influence from afar, such as Great Zimbabwe and the Swahili Sultanate, were also involved, directly or indirectly, beyond the continent itself, and were also eager to invest in securing their intellectual and cultural heritage.

He probably engaged in trade with these fellow nations as part of the vast continental alliance of medieval African economies.

And like all these great empires, Sundiata Keita invested in securing his legacy through history by leveraging narrative. Invested not only in formalizing the concept of storytelling, but in building a whole convention of telling and retelling one's own story as the key to establishing the narrative of his empire.

And these stories are still sung in the form of music.

Decades after Sundiata's death, a new king named Mansa Musa, the most famous emperor, has ascended the throne.

Today, Mansa Musa holds a large amount of gold and is famous for sending messengers to courts in Europe and the Middle East.

As ambitious as his predecessor, he saw a different kind of avenue to secure his place in history.

In 1324 Mansa Musa embarked on a pilgrimage to Mecca with thousands of followers.

It is said that 100 camels each carried 100 pounds of gold.

He is recorded to have built a fully functioning mosque every Friday during his travels and to have performed so many acts of kindness that the great Berber chronicler Ibn Battuta wrote that "Cairo was teeming with kindness, spending large sums of money on the markets of North Africa and the Middle East, influencing the price of gold in the decade that followed."

After returning home, Mansa Musa built a mosque in the center of the empire to commemorate his journey.

And his legacy, Timbuktu, represents one of the vast body of written sources produced by African scholars. About 700,000 volumes of medieval documents, ranging from academic writings to letters, are often kept in private homes.

And at its height in the 15th and 16th centuries, the university was as influential as any European institution, drawing about 25,000 students.

It was a city of about 100,000 people.

This has established Timbuktu as one of the learning centers of the world.

But this was a very particular kind of study that was focused and driven by Islam.

And since my first visit to Timbuktu, I have visited many other libraries across Africa, and despite Hegel's view that Africa has no history, Africa is not only a continent embarrassed of history, but has developed an unparalleled system for collecting and disseminating history.

Thousands of small archives and textile drum stores have become more than manuscript and material culture repositories.

They have become a font of communal narrative, a symbol of continuity, and I am sure that many European philosophers who questioned African intellectual traditions must have been aware of the prejudiced contribution of African intellectuals to Western scholarship.

They must have known of the great North African philosophers of the Middle Ages who led the Mediterranean.

They probably knew and were aware of the tradition of the Magi, which is part of Christianity.

And in the Middle Ages, the Third Sage, Balthazar, was represented as King of Africa.

He became extremely popular among his peers as the third intellectual base for Old World studies alongside Europe and Asia.

These things were well known.

These communities did not grow in isolation.

Timbuktu's wealth and power grew as the city became a hub on lucrative intercontinental trade routes.

It was the center of one continent, borderless, transcontinental, ambitious, outward-focused, and self-assured.

Berber merchants carried salt, textiles and new valuables, learning across the desert to West Africa.

However, as can be seen from this map, drawn shortly after Mansa Musa's death, there were also links to the sub-Saharan trade routes along which African ideas and traditions enriched Timbuktu's intellectual value, and indeed crossed the desert to Europe.

Manuscripts and material culture have become the font for the narrative of the community, the symbol of continuity.

And I am sure that the European intellectuals who cast the blame on our history knew fundamentally about our traditions.

And while violent forces like Ansar Dine and Boko Haram are gaining popularity in West Africa today, it is a truly indigenous dynamic and intelligent spirit of rebellion that holds fast to ancient traditions.

When Mansa Musa made Timbuktu his capital, he saw the city as the center of an open, intelligent and entrepreneurial empire thriving on great ideas wherever they came from, just as the Medici saw Florence.

The cities, cultures and very intellectual DNA of the region remain so beautiful, complex and diverse that parts of it will always remain in the narrative tradition that derives from pre-Islamic indigenous traditions.

Developed and highly successful in Mali, Islam became popular because it embraced this freedom and its inherent cultural diversity.

And its celebration of complexity, its love of hotly contested discourse, its appreciation of storytelling, remain, no matter what, at the very heart of West Africa.

And today, as shrines and mosques destroyed by Ansar Dineh are being rebuilt, many of those who instigated the destruction are imprisoned.

And we are left with a powerful lesson, a reminder once again how our histories and stories have brought our communities together over the millennia, and how they continue to be crucial to our understanding of modern Africa.

And we are also reminded that this confident, intelligent, entrepreneurial, outgoing, culturally porous and tariff-free African roots were once the envy of the world.

But those roots remain.

thank you very much.

(applause)

What does it mean to be a witness?

Why is it important to testify to people's suffering, especially when they are isolated from us?

And what happens when we turn away?

Three years ago, I traveled to the Central African Republic to cover the ongoing war.

I had heard warnings of a massacre in the jungles and deserts of this country, but no one could find the massacre, nor tell me who was killed and when.

I entered this war with very little information.

I witnessed a tragic and surreal sight, and only at the end did I realize that I had witnessed the slow preparation of ethnic cleansing.

The Central African Republic is a country about the size of Texas in central Africa with a population of about 5 million.

The country has been known for chronic violence since the end of French colonial rule in 1960.

The war I reported was between a minority Islamic government called the Seleka and a predominantly Christian militia called the Anti-Balaka.

The first sign of impending cleansing was the breakdown of trust within the community.

Three days after I arrived in this country, I saw a small city called Gaga abandoned.

A battle was about to begin.

And to save themselves, many were working as government spies to identify friends and neighbors to be murdered.

Cities, towns, and anywhere humans are, are no longer safe.

So people migrated to the jungle.

Pigs and livestock moved into the empty house, and I felt a strange sense of isolation.

In war zones, you find yourself close to killing when people leave.

The war spread across the jungle to Gaga, and I was surrounded by the roar of bombs.

Government forces drove into the jungle to attack towns harboring militias.

I rode for hours, crossing jungle streams and tall elephant grass, only to reach the town after the government had burned it to the ground and it was empty.

To see if I could talk to someone, I yelled out that I'm a friend and I didn't mean to hurt them.

A woman in a red shirt jumped out of the forest.

Others cautiously emerged from the trees and asked, "Est-ce les gens saved?"

"Do people know?"

That question surprised me.

The children were hungry and sick, but they didn't ask for food or medicine.

They asked me, "Do people know what's going on with us?"

I felt helpless while writing down their questions.

And I decided that this moment in their lives should never be forgotten.

Witnessing their crisis, I felt a small communion with these people.

From a distance, the war felt like a footnote to world news.

As a witness, the war felt like history unfolding.

The government denied committing any acts of violence, but I continued to drive through towns where people said there had been a government massacre over the past day and week.

I was overwhelmed and tried to calm myself down.

While reporting on these massacres, I sought the solace of familiar tastes and bought small treats to eat.

People in Central Africa ate these sweets to stave off hunger, leaving behind trails of thousands of plastic wrappers and fleeing.

The few radio stations still operating in the country listened mostly to pop music.

As the war raged, information about the massacre became less and less.

It became easier to feel a sense of daily life.

I have seen the impact of this missing information.

Two weeks later, I drove slowly and anxiously into an isolated militia headquarters called PK100.

Here the Christian warriors said that all Muslims were foreigners, evil and allied with the government.

They compared Muslims to animals.

There was no neutral observer or media to counter this absurd narrative, so it became the only narrative in these camps.

The militias began hunting Muslims, removing nearly 140,000 Muslims from the capital, Bangui, in just a few months.

Most of the Muslim killings and escapes were not recorded by eyewitnesses.

When I talk about my coverage in the Central African Republic, I still ask myself why I went there.

Why risk yourself?

I do this work because I feel that the neglected people in all communities are teaching us important things about who we are.

When information is missing, people have the power to manipulate reality.

If there were no witnesses, we would have believed that thousands of massacred people were still alive and hundreds of burnt homes were still there.

A war zone can turn into a mostly peaceful place when no one is watching.

And when violence passes silently, unseen, unheard, the witness becomes precious and its gaze most needed.

thank you.

(applause)

Please try to imagine. A big, sweaty, tattooed man in a cowboy hat and chaps stands in the ring as an arena full of cheering fans.

Their hero: "Cowboy" Gator McGraw.

Gator bounces off the ropes and is immediately body-slammed onto the mat.

His wild foe soared into the air and crashed into Gator's ribcage.

Gator gasped and wondered, "Is this really what my father wanted me to do?"

(Laughter) That wild guy in chaps...

it was me

(Laughter) (Applause) (Cheers) And surprisingly, the answer to that question is yes.

(laughs) I grew up watching professional wrestling with my father.

And like him, I loved showmanship, athleticism, drama, everything.

I would be a little boy hopping around the living room pretending to be my favorite wrestler on TV.

In fact, my dad reminded me a little of Hulk Hogan, but I was Hulk Hogan and he was Andre the Giant.

I got serious with him and said something like this: "father...

Someday I will be the world heavyweight champion. ”

And he always smiled and said very softly, "Okay, then I can count on you for my retirement fund."

(Laughter.) When I was 16, a little wrestling show came to my little town in Minnesota.

I couldn't believe it.

I've never seen anything like it in my town.

So I arrived at the arena early in the morning of the show and waited in the parking lot to see if I could find any wrestlers in their cars.

It wasn't as creepy as I thought it would be.

But I could tell who the wrestlers were by the way they walked.

They were tall, confident, and intimidating in tank tops and Zubaz and fanny packs.

why wouldn't i want to be them?

(Laughter) I thought, who are these people and what are they like? That's all.

How did they become wrestlers?

So before the show started, I went into this little arena (kind of like a gymnasium) and asked if I could help set up the wrestling ring.

"Okay, boy. No problem."

And I begged them to show me the wrestling moves.

"Okay, boy. No problem."

Hey, they just punched and kicked me - hard!

But I never complained.

They came to my town for a night every few months that year, and then--hmm! --The next day they were gone.

By the next year, they finally told me that one of the wrestlers was actually doing a wrestling training camp, so I begged my parents to sign it.

Next thing I knew, I was a senior in high school during the day and wrestling in front of a live crowd at night.

I had a giant poster of an alligator on my bedroom wall.

So when I needed to come up with a last-minute wrestling name, when Jesse "The Body" Ventura had already been hired, I chose "Gator."

I also wore a T-shirt and camouflage pants and fought. Because it was in the closet.

I didn't fully understand how to develop my own persona yet, but I was learning.

But I was a wrestler.

And my dad always came to my games with a t-shirt that said "Papa Gator" on the front.

(Laughter) And he was bragging to his friends about how his son was going to fund his retirement one day.

(laughter) And so will I.

Shortly after I started wrestling, my father passed away suddenly.

And as you can imagine, it destroyed me, especially as a teenage boy.

Anyone who has lost someone knows how difficult it can be.

your mind is not working properly.

Everything is so surreal.

I wanted to get back to feeling normal, even if only for a moment, so I immediately went back to wrestling.

Wrestling belonged to me and my father, right?

So I was sitting in the locker room getting ready for the game within days of my father's passing.

he is gone.

And sitting there alone, I felt like I was hiding.

But I felt the need to be there too.

One of the wrestlers who's been on the scene for a long time knows what I'm going through and has come to see how I'm enduring.

I was at a loss for words.

I just said, "I don't know what I'm doing."

And we just sat there in silence, just... just in silence.

Before he got up to prepare for his fight, he gave me this piece of advice that would change the course of my entire life.

He told me that the best wrestler is the very person himself, but "it turned up."

He said successful wrestlers find their strongest attribute and make it their focus in the ring.

So I sat there. I was a scared teenager who didn't even know who I was or why I was wrestling.

I saw some other wrestlers in the locker room and thought, 'They look so different. How can I be like them?'

And it shocked me.

That's when I realized I didn't have to be like them.

All I had to do was find out, "What does it mean to be me?"

What are my characteristics and how can I use them?

I knew I wasn't the chiseled athlete that some of the others were, but I didn't really care.

So my first thought was, "How can I amplify something as simple as the comfort of my body?"

I did not know.

And I thought: Speedo.

(Laughter) (Applause) "Trunks," as they call it in wrestling.

Right, Trunks.

I could be the big man who would wear these little trunks in front of strangers.

So I ditched my T-shirts and camo pants and a new Gator wardrobe was born.

(Laughs) I was also good at drawing manga, so I thought I could make use of it.

You can even design your own wrestling costume, so each trunk has its own design and color, all completely different. By the way, very comfortable.

(Laughter) And believe it or not, I was a funny kid in school.

So I thought maybe I could improve it.

Perhaps, from a boy who makes his friends laugh, he may become a man who can rally hundreds or thousands of people.

So I stuck with the idea that my character wasn't as scary as other characters.

From the moment I entered the arena, I was in high spirits.

With each wrestling match, I dug deeper.

I realized that I could laugh at myself.

So this guy was dancing and singing the entrance song all the way to the ring.

By the way, it was a dance.

(laughs) I was OK as a wrestler, but I found out I was even better as an entertainer.

And by transforming myself, I became unforgettable for my fans.

I was trying to find something special about myself, something simple, and I asked, "How can I improve on that?"

Now, I wanted my character to be a man among men, like my father.

I thought, "What's a man's man more than a cowboy?"

And that's when Gator became "Cowboy"... Gator...

Yes, I needed a surname.

I thought about it until my head hurt. I couldn't come up with anything.

One night, as I sat there watching TV, flipping through the channels, I came across this commercial about a country singer who had just won the Entertainer of the Year award.

Tim McGraw.

And I liked his music.

It was all just part of my process.

But I kept correcting myself until I became Cowboy Gator McGraw!

(Laughter) (Applause) And I knew that if I kept pushing myself and working harder, opportunities would come.

And finally it happened.

I received a phone call in the middle of the night.

It was a phone call that I wish my father had been near and listened to.

WWE, the world's largest professional wrestling organization, wanted me on Monday Night Raw.

Yes, my hard work and miles of work have finally paid off.

I was on live TV and had to dress up as a fake security guard (laughs) and walk down the WWE Raw entry ramp to escort another wrestler into the ring.

(Laughter) Yes, it was disappointing not to be able to wrestle, but very few wrestlers get a call from WWE.

Maybe one in hundreds.

And being Cowboy Gator McGraw got me there.

So instead of walking away that day, I decided to get back up and be the best security guard I could be.

In fact, I did it so well that I was the only security guard that was highlighted on TV that night.

That's a big deal, you know?

(Laughter) And I ended up sitting backstage all day with some of the most famous professional wrestlers in the world, including my childhood hero.

And I was able to listen to them, learn from them, and I was accepted as one of them that day.

Perhaps my WWE experience wasn't ideal.

In other words, I couldn't wrestle.

However, thanks to that, I became able to work harder and my voice grew louder year by year.

I was becoming my biggest self in the ring and other people were paying attention.

I found myself going from wrestling once a month in Minnesota to four times a week on independent wrestling circuits across the United States.

I was literally living my dream.

During the next few years of wrestling, I had a pretty bad shoulder injury around the same time my wife and I found out we were pregnant with our first child.

I know what you're thinking, but believe me when I say that these two events are totally unrelated.

(Laughter) But I needed shoulder surgery, so I wanted to go home with my family.

It was my turn to be a father.

So, on July 27, 2007, I had my last match and left professional wrestling to pursue the next chapter of my life.

And as time went on, the strangest things began to happen.

I found it quite difficult to turn down someone once invited.

I left the ring, but Gator is with me and I use a flipped version of myself every day.

My beautiful wife stayed with me throughout this entire trip.

By the way, she doesn't like professional wrestling.

(Laughter) Absolutely.

But she was always my biggest fan.

she still is.

She knows there will always be a piece of Gator McGraw here, and wants her daughter and twin sons to discover themselves as I did, but perhaps with less body slams and steel chair blows to the head.

I mean, do you know how many times she reminded me not to hang the clothesline on the referee at my kid's soccer games?

(laughs) I mean, it was just once, but my daughter was clearly fouled!

(Laughter) Now, as a parent, I'm starting to realize that my dad wanted something more valuable than retirement.

Like most parents, he wanted his children to reach their full potential.

I try to teach my kids that changing yourself is not a perfect idea of ​​how to be great, it's a way of life. It means constantly looking for what makes you different and how you can amplify that to the world.

By the way, my kids don't like professional wrestling either.

(laughs) But that's fine with me. Because each of them has their own unique talents that they can use as well as we do.

My only son is an electronics guru.

So maybe help him make a comeback and he'll be the next Steve Jobs.

My other son and daughter are good at art, so helping them develop their talents might help them become the next Pablo Picasso.

You never know what you can do until you dig.

And don't be afraid to expose yourself.

In other words, look around.

If you get nervous in front of an audience, they ask you to imagine them in their underwear.

(Laughter) (Applause) Look, the wrestling circus doesn't have to come to your town. Before you receive an invitation to be who you really are: the bigger, more attractive you.

It doesn't necessarily come from your parents.

Orienting yourself means looking inward toward who you really are and tapping into the voice that says, "Maybe, maybe, maybe, I'm more than I thought I was."

thank you.

(applause)

I recognized my role very early on.

One of the persistent notions that I have observed in our language and media is that women are not only supposed to have children, but they want to.

This existed everywhere.

It was present in the way adults spoke to me when asking questions in the context of "when."

"When you get married..."

"When I have children..."

And while these future musings were always presented to me like part of the American dream, they always felt like someone else's dream to me.

You know, a value that I always understood about myself was that I didn't want kids.

And as children, when I tried to explain this thing, the disconnect between their role and my values, they often laughed in the same way adults do to the absurdity of children.

And they deliberately said to me, "You will change your mind."

And people have been telling me things like that all my life.

Otherwise, a polite conversation can quickly become intrusive.

"Do you know your husband?"

(laughs) "Do you know your parents?"

(laughs) "Don't you want a family?"

"Don't you want to leave anything behind?"

And the main buzzword when discussing childlessness is "it's selfish."

There are myriad reasons why women choose to quit motherhood, most of which are not self-first.

However, it is still socially acceptable to publicly denigrate women in such a way that none of these reasons are embedded in the social narrative.

When I was young and learning about the inevitability of childbearing, I was never told the commonalities among what women see as the risk of inheriting genetic diseases, the danger of having to discontinue life-saving drugs during pregnancy, concerns about overpopulation, access to resources, and the fact that there are 415,000 children in foster care in the United States at any one time.

These reasons, and many others, and the fact that I don't like to leave things this big to chance, all contributed to my decision to undergo sterilization.

I began my research in earnest.

I wanted to fully understand what happens when you undergo a tubal ligation (another word for tying the fallopian tubes).

I wanted to know the approvals, satisfactions, risks and stats for the aftermath.

And at first I was empowered.

You know, the way this story has always been taught to me, I thought women who didn't want children were that rare, but then I learned that 1 in 5 American women don't have biological children -- partly by choice, partly by chance.

(Applause.) But I wasn't alone.

However, the more I read, the more disappointed I became.

I read stories of women and tried desperately to get this procedure.

I learned how common it is for women to run out of finances appealing to dozens of gynecologists over the years only to be repeatedly turned down and often given up with too blatant disrespect.

The women reported that health care workers were often condescending or disrespectful of their motives, telling them things like 'get married and have kids and come back'.

However, if a woman with children went for this operation, she was told she was "too young" and "not enough children." This is very interesting. Because in my state, the legal requirements for this type of surgery were to be at least 21 years old, to be of sound mind and to act voluntarily, and to have a 30-day waiting period.

And I was disconcerted that despite meeting all of these legal requirements, I would have to face an examination room battle over my body's autonomy.

And as daunting as it was, I was determined.

I remember coming to my first appointment in very professional attire.

(laughs) I sat up straight.

I spoke clearly.

I wanted to give the doctor every evidence that my date of birth was not on the file.

And I made sure to mention things like, "I just got my bachelor's degree and I'm going to apply for these PhD programs and study these things."

And, 'My long-time partner does this kind of business,' 'I've been researching this for months.

I understand all the risks about it. ”

Because I needed my doctor to know that this wasn't a whim or a backlash, it wasn't some 20-something trying to go out and party for fear of being knocked...

(Laughter.) I thought that this was supporting the essentials of who I am.

I understand informed consent, so I fully expected to be re-educated on how it works, but...

At some point, I began to feel that the information being given to me, mixed with prejudice and inflated statistics, was an agenda.

The question started to feel questionable.

At first, they were asking me questions to better understand my situation, but then they seemed to be asking questions in an attempt to trip me up.

I felt like I was standing on the witness stand and being cross-examined.

The doctor asked me about my partner.

"How does he or she feel about all this?"

"Well, I've been with the same man for five years, and he fully supports every decision I make about my body."

And he said, "What will happen in the future if we change partners?"

What if the person wants children? ”

And I had no idea how to react to it. Because I was listening to this doctor telling me that if my partner wants kids, I have to ignore everything I believe.

So I told him not to worry about it.

My stance on childbirth is always the first date conversation.

(laughter) (cheers) (laughter) And he wanted me to think, 'I might really regret it in 20 years' time...

As if it wasn't.

I told him, "Okay, one day I woke up and realized I should have made a different decision then, and the truth is, I just took one step out of being a parent.

Anyway, I didn't need biology to form a family. ”

(Applause.) And I'd rather deal with it any day than wake up one day and realize I've had a child I didn't really want or was ready to care for.

Because one of these only affects me.

The other is what affects children, their development and well-being. (Applause.) And humans shouldn't participate in gambling.

He then said why no one had approved this procedure, neither himself, of course, but it was because of a concept called medical paternalism that allowed him, a knowledgeable provider, to make decisions for me...

Based on his realization that it is in my best interest regardless of what I as a patient want or believe.

He is taking this opportunity to go out and discuss my case with my potential surgeon. And through the door I heard him describe me as a little girl.

I was so pissed off.

I wanted to protect myself.

I wanted to make it clear to each one of these healthcare providers how they were treating me that it was derogatory and sexist and that I didn't have to accept it.

But I got it.

I swallowed every sharp word stuck in my throat and clenched my chin, instead answering each and every one of their condescending questions and remarks.

I came here for objectivity and support, but instead felt ignored, silenced, and hated myself for it.

I hated having people disrespect me over and over again.

But this was my blow.

It was one of multiple consultations I had to go to.

At one point, I even saw five or six medical professionals at the same time.

The door to the examination room felt like a clown's car door.

There is my chief, and there is his colleague, the director.

I don't know, but I felt like you were asking me to catch smallpox instead of birth control.

But I remained unfazed, persisted, and finally persuaded one of them to let me have the operation.

And even when I'm in my room, I'm signing consent forms, taking hormone injections, and working out unfinished business...

My doctor disagrees and shakes his head.

"You will change your mind."

I never really understood how strongly this society adhered to this role until I experienced this.

I have experienced first-hand many times that people literally cannot separate me as a woman from me as a mother, whether it is a healthcare professional, a colleague, or a stranger.

And I have always believed that having children is an extension of femininity, not a definition.

I believe that a woman's worth should not be determined by whether she has children or not. Because the presence or absence of children strips women of all their identity as adults.

A woman has an amazing ability to create life, but when we say that it is her purpose, we mean that her entire being is a means to an end.

It's easy to forget that the role that society assigns to us is more than just a title.

What about the weight that comes with it, the pressure to conform to standards...

Is it the fear that comes with questioning them and the desire that we set aside to accommodate them?

There are many paths to happiness and fulfillment.

They all look very different, but I believe everyone is paved with the right to self-determination.

I want women to know that the choice to accept or abandon motherhood is in no way tied to their worth or identity as a spouse, as an adult, or as a woman...

And behind childbirth there is absolutely a choice and it is yours.

thank you.

(applause)

According to the United Nations, billions of people still live without a home.

"If you don't have an address, you're living outside the law," said economist Hernando de Soto.

You may as well not exist. ”

I'm here to tell you how me and my team are trying to change that.

If you go to an online map and look at a shantytown in Brazil or a town in South Africa, you'll see that there are a few streets, but lots of empty lots.

But when you switch to a satellite view, you can see that this vast, unmapped, unaddressed space is home to thousands of people, homes, and businesses.

In Accra, Ghana's capital, where walls are scribbled with numbers and letters, an address system was being piloted but never completed.

But these places, undeveloped places, have enormous economic potential.

This is why the addressing problem caught me.

I worked in the music industry for 10 years, and while you may not know much about the world of music, people struggle with issues to deal with every day.

So everyone, from musicians who need to find a gig, to production companies who bring in equipment, somehow always get lost.

I also had to add to my schedule the person I called when I thought they had arrived but realized they hadn't.

There were some pretty bad days, like in Italy, when the truck driver unloaded all the gear instead of an hour north of Rome and an hour south, and some pretty bad days when the keyboard player called me and said, 'Chris, don't panic, but you might have soundchecked at the wrong person's wedding.

(Laughter) So, not long after that fateful event in Rome, I had a conversation with a mathematician friend about the subject, and I thought it was a problem we could do something about.

We thought we could make a new system, but it shouldn't look like the old system.

We agreed the address was wrong.

I knew I wanted something very accurate, but GPS coordinates, latitude and longitude were too complicated.

So we divided the world into 3 meter squares.

It turns out that the world is divided into about 57 trillion 3-meter squares, and there are enough combinations of 3 words to be used in dictionaries that each 3-meter square in the world can be uniquely named with only 3 words.

We used 40,000 words, so 40,000 to the power of 3 gives us 64 trillion possible combinations of 3 words. That's 57 trillion odd 3 meter squares, which is more than enough to leave some room to spare.

That's exactly what we did.

We divided the world into 3-meter squares, each with a unique 3-word identifier (the so-called 3-word address).

For example, here I am standing at Masters.Coupon.Pinup (laughs), but here...

I am standing pinched. Alone. tutorial.

But we didn't do this only in English.

We thought it essential that people could use this system in their native language.

So far, it's built into 14 languages, including French, Swahili, and Arabic, and we're working on more, including Xhosa, Zulu, and Hindi.

But the idea isn't just about getting musicians to the show on time.

If 75% of the countries struggling with reliable addressing start using 3-word addresses, we have a lot of much more important applications.

In Durban, South Africa, an NGO called Gateway Health has distributed 11,000 three-word address signs to communities so that when pregnant mothers are in labor, they can call emergency services and tell them exactly where to pick them up. Otherwise, the ambulance could take hours to find her.

In Mongolia, the national post office has introduced this system and is making deliveries to many homes for the first time.

The United Nations can use this to tag photos of disaster areas with location information so that aid can be delivered to the right place.

Even Domino's Pizza uses this system in the Caribbean because it can't find customers' homes, but they want their pizzas delivered hot.

Soon you'll be in your car, speaking three words, and the car will navigate you to that exact location.

In Africa, the continent has jumped over telephone lines to mobile phones, bypassing traditional banks and moving directly to mobile payments.

We are really proud that the three African post offices of Nigeria, Djibouti and Côte d'Ivoire have adopted the 3-word address. This means that people in these countries now have a very simple way of describing where they live.

For me, improper addressing was an annoying frustration, but for billions of people, it's a huge business inefficiency, severely stunting infrastructure growth, and potentially costing lives.

We are on a mission to change that, three words at a time.

thank you.

(applause)

Let's go back to 1957.

Representatives of six European countries were in Rome to sign the treaty to create the European Union.

Europe has been destroyed.

A world war broke out in Europe.

Human suffering was incredibly unprecedented.

They wanted to create a peaceful and democratic Europe, a Europe that works for its people.

And one of the many components in that peace project was the common European market.

Already at that time, they saw how the market, left alone, would become, in a way, just the private property of big corporations and cartels, meeting the needs of some companies rather than the needs of their customers.

Therefore, from its first day in 1957, the European Union had rules to protect fair competition.

And that means competing on merit – competing on the quality of products, the prices we can offer, the services we offer, and the innovations we create.

It's a merit competition.

You have a good chance of succeeding in such a market.

And it is my job as Competition Secretary to ensure that companies operating in Europe comply with these regulations.

But let's take a step back.

Why do we need competition rules in the first place?

Why shouldn't companies compete?

Wouldn't it be best for us if they could compete freely? Because more competition drives higher quality, lower prices and more innovation.

Well, most do.

But the problem is that competition can sometimes be inconvenient for businesses. Because competition means the race is never over, the game is never won.

No matter how well you have done in the past, there will always be someone who wants to take your place.

The temptation to avoid competition is therefore strong.

It is rooted in motives as old as Adam and Eve. The greed for more money, the fear of losing market position and all the benefits it brings.

And when greed and fear combine with power, it's a dangerous combination.

We see it in political life.

In some parts of the world, greed and fear mix, meaning that those who hold power are reluctant to give it back.

One of the things I love and admire about democracy is the norm that forces leaders to hand over power at the dictates of voters.

And competition rules can do the same in markets, keeping greed and fear from overcoming fairness.

Because these rules mean companies cannot abuse their power to stifle competition.

Think about your car for a moment.

Thousands of parts are used, from the foam that makes up the seats to the electrical wiring and light bulbs.

And the world's automakers rely on just a few suppliers for many of these parts.

It is therefore not surprising that these suppliers are tempted to band together and fix their prices.

But imagine how that would affect the final price of a new car on the market.

However, it is not imaginary.

The European Commission has already dealt with seven different car parts cartels, some of which are still under investigation.

The Justice Department is also investigating the auto parts market here, calling it the largest criminal investigation the Justice Department has ever conducted.

But without competition rules, no investigation can be done to stop this collusion from happening and car prices to rise.

But companies aren't the only ones that can undermine fair competition.

Governments can do that too.

And governments do that when they hand out subsidies only to their favorite few, the chosen ones.

They may do so when subsidizing companies -- and, of course, all that money is being funded by taxpayers.

That could come in the form of special tax treatment, similar to the tax incentives companies such as Fiat, Starbucks and Apple have obtained from some European governments.

These subsidies prevent companies from competing on a level playing field.

These can mean that the successful companies are the ones with the most subsidies, the most networks, and certainly not the ones who serve their consumers the best.

Therefore, it may be necessary for us to step in to make sure the competition works as it should.

In doing so, competition empowers consumers to demand fair deals and helps markets to function fairly.

This means companies know that if they can't offer good prices and the service they expect, their customers will go elsewhere.

And that kind of fairness matters more than we think.

Few people think about politics all the time.

Some skip it during elections.

But we are all in the market.

We are in the market every day.

Nor do we want companies to agree on back-office prices.

We don't want them to divide the market.

We don't want big companies to shut out their competitors and keep us from showing them what they can do.

Naturally, then, we feel deceived, ignored by the market, or taken for granted.

And it can undermine not only our trust in the market, but also our trust in society.

In a recent survey, more than two-thirds of Europeans said they had felt the effects of lack of competition, such as electricity prices being too high, the medicines they needed too expensive, no real choice between traveling by bus or plane, and poor internet provider service.

In short, it turns out that the market doesn't treat them fairly.

It may seem like such a small thing, but it can give you the feeling that the world is actually unfair.

And they see a market that was supposed to serve everyone has become the private property of a few powerful companies.

The market is not society.

Of course, our society goes far beyond the market.

However, a lack of trust in the market can spill over into society, and we will lose trust in society as well.

And that might be the most important thing we have, it's trust.

We can trust each other if we are treated equally.

If we are all to have the same chances, we must follow the same basic rules.

Of course, some people and companies are more successful than others, but we can't trust a society where prizes are handed out before the competition begins.

This is where competition rules come into play. Because if you make sure the market is working fairly, companies will compete on merit. It helps build the trust we need as citizens to feel safe and in control, and the trust that enables our society to function.

Because without trust, everything becomes difficult.

Just to go about our daily lives, we have to trust strangers, trust the bank to keep our money, the builder to build us a house, the electrician to fix our wiring, the doctor to treat us when we are sick, and of course the other drivers on the road, but we all know they are crazy.

Still, we have to trust them to do the right thing.

And the problem is, the more our society grows, the more important trust becomes, and the harder it is to build.

And that is the contradiction of modern society.

And this is especially true when technology changes the way we interact.

Of course, technology can help us to some extent to build mutual trust through rating systems and other systems that enable the sharing economy.

But technology also asks us to trust algorithms and computers instead of trusting others, creating entirely new challenges.

Of course, we all see, share, and appreciate all the benefits new technology brings us.

It's very good

Self-driving cars can give people with disabilities new independence.

It always saves us time and allows us to make much better use of our resources.

Algorithms that rely on processing vast amounts of data will enable doctors to provide us with better treatments and much more.

But no one is willing to hand over their medical data or ride in an algorithm-driven car unless they trust the companies they are doing business with.

And that trust doesn't always exist.

For example, today less than a quarter of Europeans trust online businesses to protect their personal information.

But what if people knew they could rely on technology companies to treat them fairly?

What if we knew that these companies were responding to competition not by using their power to shut out competitors, but by trying to do better, to serve consumers better, for example, to promote themselves by pushing their services far down the search results list?

What if they knew that compliance with the rules was built into the algorithms by design, that they had to go to competition rules school before they were allowed to work, that those algorithms were designed to be irrelevant, that they couldn't form their own little cartel inside the black box they worked in?

Competition rules in conjunction with regulation make this possible.

They help new technologies treat people fairly and ensure that everyone competes on a level playing field.

And it helps build the trust needed for true innovation to thrive and societies to thrive for their citizens.

Because trust cannot be imposed.

it must be earned.

Since the beginning of the European Union 60 years ago, our rules of competition have helped build that trust.

A lot has changed.

It's hard to say how these six representatives judged smartphones.

But in today's world, and in theirs, competition makes markets work for everyone.

That is why I am convinced that true and fair competition plays a key role in building the trust necessary for maximum benefit in society. It starts with enforcing rules to actually make the market work for everyone.

thank you.

(Applause) Bruno Giussani: Thank you.

Thank you, Commissioner.

Margrethe Vestager: It was fun.

BG: I have two questions.

The first is about data. My impression is that technology and data are changing the way competition is conducted and the way competition regulations are designed and enforced.

Could you please comment on that?

MV: Well, it's definitely a challenge for us, because not only do we need to hone our tools, but we also need to develop new ones.

When researching Google's response to our appeal, we were researching 5.2 terabytes of data.

Quite a lot.

So we had to build a new system.

We had to find a way to do this because we can't work the same as we did just a few years ago.

So we are definitely sharpening the way we work.

Another is trying to distinguish between different types of data. This is because some data is so valuable that it can be a barrier to market entry.

The other thing it can do is lose its value tomorrow.

As such, we strive to never underestimate the fact that data serves as the currency of markets and an asset that can be a real barrier to competition.

BG: Google. You fined them 2.8 billion euros a few months ago.

MV: No, it was dollars. I'm not that strong these days.

BG: Oh well, it depends -- (laughter) Google has appealed this lawsuit. The case has been taken to court.

It goes on for a while.

Earlier last year, you asked Apple to pay $13 billion in additional taxes, but you also investigated other companies, including those in Europe and Russia, as well as American companies.

But the investigation into the US company has received the most attention, and has drawn some accusations.

You have essentially been accused of protectionism, jealousy, or using the law to fight back against American corporations who conquered European markets.

The Economist wrote on the front page this week, "Vestager vs. Valley."

how would you react to that?

MV: Well, first of all, I take this issue very seriously. Because there is no room for bias in law enforcement.

We must prove the case based on evidence, facts, and precedents in order to bring it to court.

Second, Europe is open to business, but not tax evasion.

(Applause.) The problem is that we are changing. For example, when I ask my daughters (who also use Google), they say, "Why are you doing that?"

They say, "Well, because it works. It's a very good product."

They will never come up with the answer, "Because it's an American product."

Because it simply works.

And of course it should be.

But just like that, it's important for someone to say, "We bless you while you grow and grow and grow, but if you abuse your position to the detriment of your competitors and find yourself unable to serve your consumers, the blessing stops."

BG: This is going to be an interesting case.

Thank you for coming to TED.

MV: It was fun. Thank you very much.

(applause)

HR terminology drives me crazy.

You should have OKRs, PIPs, and all those stupid acronyms for things that nobody understands.

I think you can run a business just by conversing like a normal human being.

You might actually be able to do more.

[Our way of working] I've always wanted to be an HR expert and wanted to be able to speak the language of management.

And do you know what I've learned over the years?

I don't think any of them matter.

There are many things we call "best practices" that aren't best practices at all.

How do we know it's the best? We don't measure things like this.

In fact, I've learned that "best practice" usually means copying what others are doing.

Our world is constantly changing and evolving.

Here are some lessons to adapt.

Lesson 1: Employees are adults.

You know, we've created so many layers, so many processes, and so many guidelines to keep our employees in place that we've ended up with a system that treats people like children.

And it's not.

A fully formed adult walks through your door every day.

They have their rent to pay, they have obligations, they want to be part of society, and they want to make a difference in the world.

So if you start with the assumption that everyone comes to work to do great work, you will get amazing results.

Lesson 2: Management's job is not to control people, it's to build great teams.

When managers build great teams, it's:

They did a great job.

Our customers are really happy.

These are the metrics that really matter.

It's not a metric of "Are you showing up on time?"

"Did you take a vacation?" "Did you follow the rules?"

Lesson 3: People want to do meaningful work.

After doing that, you should be free to move on.

A career is a journey.

No one wants to do the same thing for 60 years.

So the idea of ​​keeping people for the sake of keeping people really hurts for both of us.

What if instead we created a company that would be a great place to live?

And everyone who leaves you becomes an ambassador not just for your product, but for who you are and how you operate.

And by spreading that kind of excitement around the world, we can make every company better.

Lesson 4: Everyone in your company needs to understand your business.

Now, based on the premise that we have smart adults here, the most important thing we can teach them is how our business works.

When you look at companies that move fast, companies that are really innovative and are doing great things with agility and speed, it's because they're collaborative.

The best we can do is to constantly teach each other what we do, what is important to us, what we measure, what good looks like, so that we can all move towards achieving the same thing.

Lesson 5: Everyone in your company must be able to deal with the truth.

Do you know why people say giving feedback is so hard?

they don't practice

Let's take a look at the annual performance review.

What else in your life are you really good at, something you only do once a year?

What I have discovered is that humans can hear anything if it is true.

So let's rethink the word "feedback" and think of it as telling the truth, the honest truth in the moment, about what people are doing right and wrong.

You did a good job, oh!

That's exactly what I'm talking about.

please do it again.

And people will repeat the same thing three more times today.

Lesson 6: Your company needs to live its values.

Not long ago, I was talking to the CEO of a company.

He had problems because the company was unstable and things didn't get done on time and he felt things were sloppy.

This was also the man I observed who never showed up on time for any meeting.

ever.

If you're part of a leadership team, the most important thing you can do to "defend your values" is live them.

A person cannot become invisible.

We say, “Yes, we are here for equality,” and we proudly celebrate that we have achieved 30% women on our executive team.

Well, it's not equal, it's 30 percent.

Lesson 7: All startup ideas are stupid.

I spend a lot of time with start-ups and have many friends who work at larger, established companies.

They always disgust the company I work for.

"That's a very stupid idea."

Well, all startup ideas are stupid.

If they were reasonable, someone else would already be doing them.

Lesson 8: All companies need to be excited about change.

Beware of nostalgia fumes.

If you think, "Do you remember the old days?"

I want you to change your way of thinking to "Let's think about what will happen."

If I had a dream company, I would walk in the door and say, 'Everything has changed, all bets have failed.

We were sprinting to the right and now make a big turn to the left. ”

It's a very exciting world out there and it's always changing.

The more you embrace it and get excited about it, the more fun it will be.

My name is Glenn, I'm 25, I don't know my real last name.

It's not uncommon in America.

Most blacks in this country go by the surname of their slave owners.

Black history has been systematically erased and altered over the centuries.

As I tell this story, there are over 700 Confederate memorials standing across the country.

These were erected from the 1890s through the 1950s, when the Jim Crow laws enforcing segregation were in full force, primarily to honor the Confederate soldiers who fought to maintain slavery in the South.

To this day, blacks are forced to confront slaveholder memorials in public.

These memorials are the physical representation of a system that is actively working to define whose lives matter and whose lives do not.

If you're going to destroy the story, you have to start from the origin.

Genocide, slavery and patriarchy began in the Americas with Christopher Columbus.

Most people in the United States know of his voyage in 1492.

Few know that an estimated 250,000 indigenous Arawak people were exterminated within two years of his arrival.

Even fewer know that Columbus admitted in a letter to Doña Juana de la Torre that "girls aged 9 and 10 are in high demand, and girls of all ages must be paid accordingly."

But Columbus Circle in New York City has had him sit 76 feet tall next to Central Park since 1892.

I started a non-profit organization called Movers and Shakers that wants the statue removed.

Movers and Shakers is a group of activists, artists, educators, and engineers focused on using immersive technology to highlight the stories of the oppressed.

Our campaign to pull Columbus off its pedestal tackled a visually provocative form of activism.

We created an augmented reality installation based on the true story of Christopher Columbus and used it to host teach-ins at Columbus Circle and Times Square.

Many see the controversy over the statue as tension between the Italian-American and Native American communities.

The reality is that most black people are in this country as a result of atrocities initiated by Christopher Columbus.

So we decided to hold a slave auction in Union Square to tie it to the origins of the transatlantic slave trade.

To raise awareness of this issue, I ran the New York City Marathon in chains.

I was also arrested for hosting a slave reenactment at the football team's home opener at Giants Stadium.

We tried our best, but in the end, New York City decided to keep the statue, and New York State voted unanimously in favor of making it a landmark.

This news was shocking, but it opened new doors.

We realized that with augmented reality, you don't need government permission to build a monument or make a statement.

That's it.

As such, New York City now has more than 150 male statues and six female statues, all of which publicly acknowledge slave owners.

So we thought, what if we put a lot of women and people of color AR monuments all over the city?

Monuments are usually created to commemorate the achievements of the deceased, but augmented reality allows us to change the rules.

We started with sports.

Colin Kaepernick.

He was the starting quarterback for the San Francisco 49ers and wanted to use his position to highlight the injustice of systemic racism.

So he consulted the Green Berets on how to best show respect and decided to kneel during the national anthem.

He lost his contract with the 49ers, was criticized by every owner in the NFL, criticized by millions, and even the President of the United States made decisions that insulted him.

Our team decided to do this because it may be decades before Colin Kaepernick's bravery is fully respected.

Now anyone who walks in front of Trump Tower can see Colin Kaepernick on his knees in augmented reality, but there's nothing they can do about it.

(Laughter.) Expression is important.

Serena Williams has proven to the world that a black girl from Compton can conquer a sport traditionally played in posh country clubs.

Celebrate her now.

Jackie Robinson.

He broke down color barriers and enabled many black athletes to play in the major leagues.

We're going to put this memorial to him at Ebbets Field so everyone can see him swinging for the fence at Ebbets Field in Brooklyn.

Augmented reality gives us the power to tell the stories that should be told in public.

People like Frida Kahlo, Audre Lorde, Toussaint Louverture and Madame C.J. Walker are well known.

Our vision is "Pokémon Go" with history contextualized.

Augmented reality can also be used as a tool to help organizations combat systemic oppression.

In 2019, we plan to release a free smartphone app with augmented reality monuments and content.

Pick up your smartphone and hold it up to a dollar bill to see an augmented reality scene demonstrating the injustice of cash bail.

A click on the screen then takes you to the Bail Project donation page, a fund that raises money for those without bail.

With augmented reality, our people can gain the power to highlight the stories of the oppressed, even when the system rejects them.

This tool allows you to highlight the systematic impact of erasing someone's history.

And more specifically, we can use this technology as a way to support efforts to combat systemic racism.

With AR, we have the power to reimagine a world that prioritizes justice over oppression.

thank you.

(applause and cheers)

Here are two images of the house.

There is one obvious difference, but P.S. to this patient they looked exactly the same.

P.S. She had a stroke that damaged her right brain and left her left brain numb.

But she couldn't tell the difference between the two houses, but when researchers asked her which one she would rather live in, she chose the unburned house more than once.

P.S.'s brain was still processing information from the entire field of view.

She saw both images and could tell the difference, but she simply didn't know it.

If someone throws the ball to her left side, she may crouch.

But she was completely unaware of the ball, and had no idea why she stooped.

A condition of P.S. known as hemispatial neglect reveals important differences between information processing in the brain and our experience of that processing.

That experience is what we call consciousness.

We are conscious of both the outer world and our inner self. We perceive images in the same way that we perceive ourselves and our inner thoughts and feelings when we look at them.

But where does consciousness come from?

Scientists, theologians, and philosophers have spent centuries trying to get to the bottom of the issue, but no consensus has been reached.

One recent theory is that consciousness is an imperfect representation of the brain's own activity.

To understand this theory, it helps to get a clear understanding of one important way the brain processes information from the senses.

Build models based on sensory input to continuously update simplified descriptions of objects and events in the world.

Everything we know is based on these models.

They do not capture all the details of what is described enough for the brain to judge the appropriate response.

For example, one model built deep into the visual system encodes white light as colorless brightness.

In fact, white light contains wavelengths that correspond to all the different colors we can see.

Our perception of white light is wrong and oversimplified, but enough for us to function.

Similarly, the body model of the brain tracks the composition of limbs, but not individual cells or even muscles. Because that level of information is not needed to plan a move.

Without a model to track body size, shape, and moment-to-moment motion, we would quickly get hurt.

The brain also needs its own model.

For example, the brain has the ability to pay attention to specific objects and events.

We also control that focus, shifting our internal and external focus from one to another according to our needs.

Without the ability to direct our attention, we cannot assess threats, finish our meals, or function at all.

To effectively control your attention, your brain must build its own model of attention.

With 86 billion neurons constantly interacting, it is impossible for the brain's own model of information processing to be completely self-descriptive.

But like body models and our concept of white light, it doesn't have to be.

The belief that we have metaphysical and subjective experiences may come from one of the brain's models, a straightforward explanation of what it means to process information in a focused and deep way.

Scientists are already trying to figure out how the brain creates its own model.

MRI studies are a promising means to pinpoint the networks involved.

These studies compare patterns of neural activation with and without awareness of sensory stimuli such as images.

The results show that the regions required for visual processing are activated whether or not the participant is aware of the image, whereas the entire additional network lights up only when the participant is conscious of seeing the image.

Patients with hemispatial neglect, such as P.S., usually have damage to certain parts of this network.

More extensive damage to the network can lead to a vegetative state with no signs of consciousness.

Evidence like this brings us closer to understanding how consciousness is hardwired into the brain, but we still have much to learn.

For example, how neurons in networks related to consciousness compute specific information is outside the scope of current technology.

Using science to approach the question of consciousness will open new avenues of inquiry into human identity.

The world's largest orchid grows several meters in height.

The tiniest ones are almost invisible.

Some bloom high in trees, while others live underground.

Overall, there are about 28,000 species of orchids on Earth. That's almost as many as all bird, mammal and reptile species combined.

They grow all over the world and come in every imaginable color, shape and pattern.

And there is a cunning purpose behind these elaborate exhibits. Many orchids trick insects and sometimes even have sex with them.

Like other flowers, most orchids require insects to collect and transport pollen between plants.

But unlike most flowers, which attract a wide variety of pollinators with their sweet nectar, these masters of deception deploy other tactics, such as pretending to be insect companions, exuding enchanting scents, and mimicking the appearance of other species.

One of their most interesting techniques is sexual deception.

Through a combination of sexy shapes and pheromones, orchids persuade insects to mate.

For example, the bee orchid petals are almost identical to the velvety body of the bee.

This camouflage is so convincing that a male bee lands on an orchid, attempts to mate with it, and picks up pollen on its way.

Other orchids have evolved contrasting colors and ultraviolet spots that are invisible to humans but irresistible to insects.

Some even have tactile "love handles" that ensure the insect is precisely positioned for pollination.

For example, when a male wasp lands on a hammer run, its frenzied mating action flips the flower's hinges, forcing its body into the pollen.

The next time he visits a flower, the same hinge forces his pollen-covered body against the stigma, fertilizing it.

Some orchids make such convincing mating partners that insects ejaculate onto them, wasting precious sperm.

But the most important component of sexual deception is scent. Orchids accurately imitate the scent of a single species of insect.

This is possible because many insects and flowers produce simple organic compounds called hydrocarbons, which form a layer that protects the body from drying out.

The exact blend of compounds in this layer varies from species to species.

Its scent also serves as a way for insects to attract potential mates, known as sex pheromones.

Over thousands of years, random combinations of compounds have given some orchid species exactly the same characteristic scent as certain insect species.

This matching scent allows it to attract male pollinators who repeatedly fall for female-looking flowers of the same species.

Sexual deception isn't the only thing Ran does well.

Their oldest deception mimics the shape and color of other nectar-producing flowers, but does not contain sweet nectar.

Some orchids disguise places where insects lay their eggs.

Some species not only have the color and appearance of rotting flesh. It also emits a rotten odor, which attracts flies, lays eggs on the flowers, and unwittingly pollinates them.

Other orchids are very similar in appearance and smell to the fungi in which certain insects lay their eggs.

Where do all these strange adaptations come from?

Random genetic mutations in orchids can result in traits that happen to match the needs of a single insect species, such as scent and shape.

The great diversity in the insect world also increases the chances of orchids finding a unique audience.

Able to produce more seeds and offspring with the help of devoted pollinators, this orchid successfully propagates alone and becomes a new species.

But because orchids sometimes rely on just one pollinator species, they are vulnerable and many quickly become extinct.

However, over time, more orchid species have emerged than have gone extinct, making orchids one of the most diverse flowering plants.

They have very vibrant and otherworldly forms and can sometimes deceive the human senses. Some petals look like dancing little people, monkey faces, spiders and even flying birds.

Bryn Friedman: You're the company funding and investing in these AI programs.

So why should we trust you to be open-minded and tell us what really works for us about the future of work?

Roy Bachat: Yes, yes.

And when you wake up in the morning and read the newspaper and it says, 'Robots are coming and they might take all our jobs,' it was the first time that, as an emerging investor focused on the future of work, I said our fund should focus on artificial intelligence.

So I woke up one morning and read it and I was like, 'Oh my God, they're talking about me.

And so I thought. wait a minute.

If things continue as they are, perhaps not only will the startups we invest in suffer from not being able to buy or get jobs to buy what they make, but our economy and society may suffer as well.

And look, I have to be the guy who sits here and says to you, "All will be fine. All will be fine."

A few years after the introduction of ATM machines, banks had more tellers. ”

That's true.

Still, I saw it and thought, "This is going to accelerate."

Even if it accelerates, the center may not be maintained. ”

But I thought someone must know the answer to this. I have a lot of ideas.

And I read all the books and went to conferences. And at one point, I counted over 100 initiatives to study the future of work.

And it was a frustrating experience, as I heard the same conversation over and over again, "Robots are coming!"

And someone else will say, "Oh, don't worry about that, they always say that and it turns out to be okay."

Then another person will say, "Well, anyway, it's a matter of what your job means."

And then everyone just shrugged and walked away and had a drink.

And it felt like there was this argumentative kabuki theater where no one was talking to each other.

And a lot of the tech people I knew and worked with weren't talking to policymakers. Policy makers did not speak to them.

So we partnered with a non-partisan think-tank NGO called New America to study this issue.

And we've literally got a group of people in the same room, including tech AI emperors, video game designers, core conservatives, Wall Street investors, and socialist magazine editors. It was awkward at times trying to figure out what was going on here.

The question we asked was simple.

The question was, "How will technology affect work?"

And we looked 10 to 20 years ahead. Because we wanted to look far enough that real change could happen, but it's not going to be teleportation or anything like that anytime soon.

And we've recognized that it's hard to predict what's going to happen - and every year we're reminded all over the world of this.

So there are other things you can do instead of predicting.

Imagine another possible future. that's us.

We did a scenario planning exercise, imagining the case where no job is safe.

We imagined a case where every job is safe.

And we imagined every possibility we could.

And the results really surprised us. As we pondered these futures and what to do, it turns out that the answer to what we should do is the same no matter what actually happens.

And when we look 10 or 20 years into the future, we find, ironically, that what we want to do is actually happening now.

Automation is now, the future is now.

BF: So what does that mean and what does it tell us?

If the future is now, what should we do and what should we think?

RB: First you have to understand the problem.

And the data show that even as the economy has become more productive and individual workers have become more productive, their wages have not increased.

At least in the United States, there are three times as many men who are not working when looking at the percentage of prime-age men who are working today compared to 1960.

And listen.

I sat down with a group of Walmart employees and asked, "What do you think of this cashier, this futuristic self-checkout?"

They said, "Good, but have you heard of cash recyclers?"

It's a machine that's currently in place that currently saves two jobs at every Walmart. ”

So we thought, "Oh, we don't understand the problem."

So we focused on the voices of the excluded, all those affected by this change.

And we decided to listen to something like "automation and its frustration."

And I've spent the last few years doing so.

I traveled to Flint, Michigan and Youngstown, Ohio to speak to entrepreneurs trying to thrive in environments that are very different from New York, San Francisco, London and Tokyo.

I've been to prison twice and talked to inmates about jobs after release.

I've been asking truck drivers who care for elderly relatives in addition to their full-time jobs about self-driving trucks.

And when I talk to people, there are two themes that really stand out.

The first is that people don't really want more money or the fear of robots taking their jobs, they just want stability.

They want predictability.

So when you poll people and ask them what they want from a job, those who earn less than $150,000 a year would, on average, want a more stable and secure income than they would want to make more money.

And given the fact that not only all the people on the planet who don't earn a living, but the majority of those who do, have varying and volatile incomes from month to month, you suddenly realize, "Wait a minute, we're in serious trouble."

And the second thing they say, which took us longer to figure out, is they want dignity.

And the concept of self-worth through work came up again and again in our conversations.

BF: So I certainly appreciate this answer.

But you can't eat dignity, and you can't clothe your children with self-respect.

So what is it and how do you reconcile? What does dignity mean? What is the relationship between dignity and stability?

RB: You can't eat dignity. First, we need stability.

And the good news is that a lot of the conversations going on right now are about how to solve it.

As you know, I advocate researching guaranteed income. An example of this is conversations about how health care is delivered and other benefits.

Those conversations are taking place and the time has come when we must understand them.

It is the crisis of our time.

And my take after talking to people is that we might do that, but it might not be enough.

Because what we have to do from the beginning is to understand that work is something that gives people dignity and allows them to live the life they want to live.

And that notion of dignity is...

Because when a lot of people, especially those who are honestly wealthy, hear it, they hear "meaning."

And again, let's say you poll people and ask them, "How important is your job to you?"

Only people making more than $150,000 a year would say their job is important.

BF: Does it make sense, does it make sense?

RB: I just defined it as, "Is your job important to you?"

In whatever sense someone interprets it.

And yet, of course, dignity is essential.

When I spoke to the truck driver, he said, "I saw my cousin driving, and when I hit the open road, it was great.

And I started making more money than people who went to college. ”

And then they come to the end of their thoughts and say something like, "People need fruits and vegetables in the morning, and I'm the guy to get them."

he was making a lot of money.

At one point we asked, "What is aunt care? Can't you pay someone else to do it?"

He said, "My aunt doesn't want us to pay to buy someone.

In other words, the concept of being needed was there.

If you study the word "dignity", you will find something very interesting.

It is one of the oldest words in ancient English.

It has two meanings. One is self-esteem and the other is that something is appropriate or worthy, meaning that you are part of something bigger than yourself and connected to a wider whole.

In other words, you are needed.

BF: So how do you answer this question, this notion that we are not paying teachers and aged care workers, and not paying enough to people who really care and are needed?

RB: Well, the good news is that people are finally asking questions.

So, as AI investors, we often get calls from foundations, CEOs, and boardrooms asking, "What should I do about this?"

And they used to ask, "How do we introduce automation?"

And now they are asking, "What to do with self-esteem?"

And they know that dignity is essential for employees with spouses who care for someone to perform their jobs.

I think there are two kinds of answers. One is the financial aspect of getting on with your life.

It is stable. Must eat.

And think more broadly about our culture and ask, "Who do we make heroes?"

And what I would love to see is a heroic caregiver on the cover of a magazine.

Or the Netflix series that dramatizes someone who makes all of our other lives work so that we can do what we do.

Let's make heroes out of them.

It's a Netflix show that I'm obsessed with.

And there is an earlier chronicler on this - Studs Terkel, Oral History of Work Experience in the United States.

And what we need is the experience of needing and connecting with each other.

Perhaps that's the answer to how we all fit in as a society.

A thought exercise for me is, if you could go back 100 years and have people like my grandparents, great grandparents, seamstresses, who worked in mines, they would see what we all do for a living and say, "That's not work."

We're sitting there typing and talking and there's no risk of injury.

And my guess is that even if we were to imagine 100 years from now, we would still be doing things for each other.

we still need each other.

And we would just think of it as a job.

My point is that dignity is not just about getting a job.

Because when you say, as many people say, that you need a job to maintain your dignity, in that moment you suddenly say to every parent, every teacher, every caregiver that they somehow lack essential human qualities because they are not being paid for what they are doing.

For me, it is the great mystery of our time. Can you find a way to provide that stability throughout your life? And how can we find a way to create a multigenerational, inclusive society that includes all the different human experiences, not just race and gender, in a way that we understand how we need each other?

BF: Thank you. RB: Thank you.

BF: Thank you very much for joining us.

(applause)

About 18 months ago I had a really bad week.

One night I was on my way home from work, and it was a hot evening when the traffic had stopped. As I was walking down the street and a car was crawling next to me, a few guys started screaming out the car window about my feet and what they were trying to do to me.

And I ignored them, went home and continued with it like you.

A few days later, I was on the bus late at night on my way home and was calling my mom.

At first I thought the guy next to me had accidentally rubbed my leg with his hand.

And I kept talking to my mother.

Then I realized he was actually grabbing my leg and groping and moving his hand towards my crotch.

I got up to leave, but I was on the phone so I spoke up. I don't think I did it any other time.

I said, "This man is molesting me on the bus."

Everyone on the bus was staring out the window, at their feet, and at their phones.

Surely no one intervened, but more than that, there was really a sense of 'why are you making a fuss, ladies?

this is your problem. Please deal with it. don't make us think about it. ”

Hearing that, I immediately felt embarrassed.

It triggered thoughts of feeling like I had done something wrong, or that I shouldn't have been out so late, or put on the clothes I'm wearing, and all those thoughts that reaction provokes.

And again, I continued.

I went home and didn't say anything about it. Like you, I have done it.

A few days later, I was walking down the street in broad daylight.

A large truck was unloading, with scaffolding off its back, and two men working together.

As I passed, one turned to the other and said, "Look at those boobs over there."

"that" instead of "she".

Even though I was a meter away, they started talking about me as if I wasn't there and I could hear them really clearly.

What really struck me about these three incidents is that if they hadn't happened in the same week, I wouldn't have given much thought to any of them.

I started asking myself why that was. "Why is this so common?" Why was I so used to them?

I began to remember hundreds of things that happened over the course of weeks, months, and years that I had never told anyone about because they were normal.

I started asking other women—women I knew, older women, younger women, women I met—“Have you ever been through this?”

And I honestly thought one or two women would have stories.

One or two people will say, "Yes, this happened a few years ago," or, "I used to have a job where this happened."

But it wasn't.

All I spoke to were women.

And that was not what happened a few years ago.

It was hundreds of things.

“This happened on the way here, this happened yesterday, this happens almost every day.”

But just like me, they never told anyone those stories until I asked them.

Because they were used to it, it was normal.

I started trying to speak up about this. Because I knew I had this big problem. And I started talking about it, and I got the same response over and over again.

People say, 'Stop making a fuss.

Women are more or less equal now. ”

If women were equal now, talking about sexism and complaining about sexism must be an overreaction.

Or maybe you have no sense of humor. Alternatively, you may need to learn to accept compliments. Or maybe you're a little frigid or edgy and need to learn to accept jokes.

Maybe they are right, I thought, maybe women are more or less equal now. Perhaps I was overreacting.

I thought to look into it and interrogate the claims, and I did.

These are some of the things I've found: Women are more or less equal now.

Fewer than one in four members of Congress are women, except in the Capitol, where policies that affect us all are debated and defined.

Women make up one-fifth of the members of the House of Peers.

The UK ranks 57th in the world for gender equality in parliament.

So I looked up the law and found that only 4 of the 35 Court of Appeals judges and only 18 of the 108 High Court judges were women.

I decided to turn my attention to the entertainment industry.

According to reports in 2010, the National Gallery, one of the country's most prestigious art institutions, had paintings by just 10 women among its 2,300 works.

It has been over 13 years since the Royal Opera House commissioned a female choreographer to create a piece for the main stage.

And of the list of 573 statues commemorating important figures across Britain, only 15% are women.

Our research found that less than 1 in 10 of our engineers are women, less than half of France and Spain. One of our most prestigious scientific institutions, the Royal Society has never had a female president and only 5 per cent of its current members are women.

And while women make up 50 percent of chemistry undergraduates, only 6 percent of professors.

Women write only one-fifth of the front pages of newspapers, yet 84 percent of them were found to be dominated by male subjects or experts.

Only 5% of the 250 major films in 2011 were directed by women, and 63% of them reported having experienced sexual harassment in the workplace over the course of their careers, even though only 1 in 5 British architects are women.

Then I looked up crime statistics.

Women are more or less equal now.

However, at least two women in the UK are murdered each week by their current or former partners.

There are calls to the police about domestic violence every minute.

A woman is raped every 6-7 minutes, and in total there are over 85,000 rapes and over 400,000 sexual assaults per year.

In the UK, women have a 1 in 4 chance of being the victim of domestic violence and a 1 in 5 chance of being the victim of a sexual crime.

Worldwide, one in three women on the planet will be raped or assaulted in their lifetime.

I decided that the claim that women were now equal and shouldn't fuss really didn't stand up to scrutiny.

In fact, it seemed to me that it was time for some real fuss.

So I set up a simple website. Because I realized that you can't solve a problem if people refuse to even admit it exists. And what I really wanted people to experience was the experience of seeing these things laid out like a map in front of them and recognizing how much trouble there was and how bad it was.

I launched a very simple website called "The Everyday Sexism Project" and asked women and men to add their daily experiences of gender imbalance. Everything from very small standardized to much larger scales.

I didn't have the money or the means to promote it, so I figured maybe 20 or 30 women would add their stories. And hoped it would help build solidarity and raise awareness.

But instead, things went a little better than I expected.

[75,000 WOMEN STAY AGAINST SEXUALITY] 50,000 women from all over the world added their stories in 18 months.

They were women and men of all nationalities, of all ages, races, ethnicities, sexual orientations, gender identities, religious and non-religious, disabled and non-disabled, employed and unemployed.

We spoke with a 7-year-old disabled girl in a wheelchair and a 74-year-old woman on a mobility scooter. They had almost the same experience of shouting curses at "female drivers".

Asked if there was a man available to officiate the wedding or funeral, a female Anglican minister replied: "Nothing personal."

A man was blessed for babysitting his children.

A woman working in the city was asked if she would sit on her boss's lap if she wanted a Christmas bonus.

A woman who worked in a video store said that every time she climbed the ladder to the warehouse, her boss would slap her on the buttocks, and when she came down, she would look up and say,

One waitress was told to choose between having an abortion or quitting if she got pregnant.

The 15-year-old wrote that she knew she was smart and funny and could do whatever she wanted, but that she knew from the world and media around her that it didn't really matter if she was a doctor or a lawyer, so all that really mattered was whether she was sexy, whether her breasts got bigger and her waist got smaller, and whether boys found her attractive.

A 13-year-old girl wrote that at school she was shown sex videos, pornographic videos on a boy's mobile phone, and now cries every night because she is afraid to have sex because she didn't realize that sex is about hurting and crying for women.

A Pakistani woman said she hid her abuse for family honor.

A Brazilian woman tried to ignore three men who were harassing her, but eventually realized they tried to drag her into her car.

In Mexico, a woman was told by a university professor, "Calladita te ves más bonita," "You look prettier when you keep quiet."

This is what happened when I gave a speech about politics - [I think Laura should show the boobs so we can judge for ourselves.] ][I'm not sexist or anything, but she might keep a nice pair...] This is what I felt every day.

But not just once a day, but up to 200 times a day, just to speak up.

Ironically, the people who wanted to cancel the project and sent messages showed how important and necessary the project was.

[Fuck you stupid woman] The fact that it was such a terrifying fact for some people, someone who just wants to talk about equality, just wants to speak up for women and provide a space for women's stories, tell me exactly how they want to dismember me, exactly with what weapon and in what order, and not just if I should be raped, but exactly how I should be raped, what orifice, where, when, where. The fact that I had to.

Then something else started happening.

After receiving about 10,000 stories, I started receiving a few stories with a completely different tone.

Success stories are now available.

We began to hear women say that they were avid runners but often encountered harassment but thought that was the way it was.

Later, after reading the articles on the website, I realized that other women had confronted this issue, and that other people also acknowledged that this was not normal and that it was not okay.

The next time she went for a run, a man happened to call her out of the car and ask her for directions.

So she went over to him and helped him out and he reached out the car window and grabbed her chest really hard and really hurt her.

She said she felt a rush of emotions, fear, embarrassment, embarrassment, the urge to run away, all the experiences she normally felt in the situation. But at the same time, I felt something I had never felt before. It was that feeling of the women standing behind her. It gave her power for a moment before she stopped and took down the man's license plate. The man is now indicted for assault.

We were able to bring over 2,000 stories we had collected that specifically described experiences of women being harassed and assaulted on public transport when the UK Transport Police decided to look into how to police sex crimes.

We have analyzed why women feel they cannot report, heard from their own voices and worked with UK Transport Police to send a message to people around the world that this issue is taken seriously and can be reported.

So far, its project, Project Guardian, has seen an increase of up to 20% in reports of harassment and assault against Tube.

We could start talking to college girls about the definition of sexual assault in the UK, and it's pretty simple.

Under British law, it is a form of sexual assault when someone touches any part of your body, the touch is sexual, you are not consenting and you have no reason to believe that you are consenting.

Girls came to me and said, 'It's normal and it's not sexual assault.'

"It's not sexual assault, it's what happens when you go out with friends."

"It can't be sexual assault because you can't call it that, people won't take me seriously, and you can't go to the police."

We were able to change that attitude and start receiving reports of people reporting things they never thought they had the right to disagree with.

Also, we started hearing people's stand-up individual stories. It was really fascinating and important. Because these aren't banner-waving and marching tales, they're just as precious. Because they were the stories of women and men from all over the world who found the most unique and personal ways to stand up that worked for them and made a difference in their lives.

We heard from a woman who was being sexually harassed in her office. When I printed out a copy of the workplace's sexual harassment policy and put it on each person's desk, the harassment stopped.

I heard a woman say she was tired of the cold phone ringing.

She was a single mother and was tired of calling to talk to the man in the house.

Now she's putting it on her 6-year-old son (laughs), who apparently sings it, 'I'm sexy and I know it.

(Laughter) I was told by a man who passed by a construction site that two construction workers were yelling at two women across the road, "Show your boobs!"

So he tucked up a T-shirt instead.

I heard a woman say that every time someone yelled, "Nice boobs!" At her on the street, she looked down at them and screamed as if they had never seen them before.

(Laughter) (Applause) I heard from a man who had never really thought about harassment before, but reading the article gave him new insights into how women really feel. Next, when he saw another man harassing two women in the street, he ran after him, tapped him on the shoulder and said, "I'm sorry, can I ask you a minute, why did you do that?"

And the other man couldn't answer. Because he had never been asked that question before. Because it was normal for him too.

He grew up in a world where it was normal and what men do.

That's what really matters here. Because, unfortunately and frustratingly, we are no longer able to point to the specific policy changes and legislation needed to solve this problem.

The UK in particular has good legislation in place right now, a good example of which is the Workplace Sexual Harassment Act, which is great.

The largest category of entries we receive are from women who are being harassed, assaulted or discriminated against at work.

What we need is a cultural and social change in our attitudes towards women and violence against women.

Because when someone grabs her breasts, people at work who just call it a "joke" and laugh along and joke around make her feel unreportable.

It's kind of interesting because it means we can all be part of the solution.

If the Everyday Sexism Project has shown anything, it's that it's a continuum.

All these are connected.

The attitudes and attitudes towards women that underlie 'minor' cases of sexism and harassment, which are often told to ignore and don't make a fuss, are the same attitudes and attitudes toward women that underlie more serious cases of assault and rape.

What that means is that by contributing to a cultural change in how women are perceived, whether in the media, professional sphere, social or economic sphere, we can contribute to changes in how women are perceived and treated in other spheres as well.

This means that each of us can be a part of change.

It doesn't necessarily target the perpetrator, nor does it teach the victim that they should act a certain way or react a certain way.

It was the people at work that made it difficult for the woman to speak up. It's about the people who were looking out the window on the bus that day.

Join us for change.

Be the cool uncle or aunt buying a chemistry set for your niece or a house cooker for your nephew.

Be the teenager who tells your friends that calling women sluts and whores is actually not good or funny.

Be the person who makes the person who has been molested understand that it is taken seriously and that they have the right to report it.

Become a tabloid editor who commissions articles that don't feature pictures of female breasts.

If you see a woman being harassed at a bus stop, be the one to jump in.

Or you might be the person on the bus who stands up and says, "It's not okay."

Because when everyone raises their voices, it becomes the loudest voice.

(applause)

i was 8 years old.

I remember that day as vividly as if it was yesterday.

My mom is a biddy roller.

She rolls country tobacco to feed our family.

She was a hard worker, spending 10-12 hours on a rolling biddy every day.

That day she came home and showed me a double payroll book.

She asked me how much I had earned that week.

I read through the book and what caught my eye was her thumbprint on each page.

My mother has never been to school.

She uses thumbprints instead of signatures to keep track of her income.

That day, for some reason, I wanted to teach her how to hold a pen and how to write her name.

She was reluctant at first.

She smiled innocently and said no.

But deep down, she was sure she wanted to try it.

With a little patience and a lot of effort we managed to write her name.

Her hands were shaking and her face was shining with pride.

For the first time in my life, watching her do this made me feel irreplaceable. It means, "Maybe I can be of use to this world."

I'm not a helpful person, so that feeling was very special.

In rural India, girls are generally considered worthless.

They are responsibilities and burdens.

The only thing considered useful is cooking, cleaning the house, or raising children.

As the second daughter of a conservative Indian family, from an early age I had a clear sense that no one expected anything from me.

I was conditioned to believe that the three identities that defined me—a poor village girl—meant that I had to live a life of silence and no choice.

These three identities made me think I should never have been born.

And yet I was.

Throughout my childhood, I used to think this while rolling a biddy with my mom. "What about my future?"

I was very anxious and used to ask my mother, "Amma, is my life different from yours?"

Will I have the chance to choose my life?

should i go to college ”

She replied, "Try to finish high school first."

I'm sure my mother didn't mean to disrespect me.

She just wanted me to understand that my dreams might be too big for a village girl.

When I was 13, I found the autobiography of Helen Keller.

Helen has been my inspiration.

I admired her fortitude.

Like her, I wanted to get a college degree, so I struggled with my father and other relatives to get her to go to college, but it worked out.

In my final year of undergraduate studies, desperate to avoid being forced into marriage, I applied to a fellowship program in Delhi, about 2,600 miles from my village.

(laughs) In fact, I remember filling out the application form only during my commute to the university.

I didn't have access to a computer, so I had to borrow a college junior's cell phone.

Being a woman, I couldn't be seen holding my cell phone, so I hid his cell phone under my shawl and typed as slowly as I could so I couldn't hear him.

After many interviews, I was accepted into a fellowship program with a full scholarship.

My father was confused and my mother was worried -- (Applause) My father was confused and my mother was worried, but my heart was pounding because it was my first time leaving the village to study in the capital.

Of the 97 fellows selected that year, I was the only one to graduate from a rural university.

No one there looked like me or spoke like me.

I felt alienated, threatened and criticized by many.

A fellow called me "Coconut Girl".

Do you know why?

who?

I used a lot of coconut oil on my hair.

(laughter) Another asked me where I learned to speak English. Some of my colleagues didn't like me on the mission team, thinking I couldn't contribute to the discussion.

Many of my colleagues seemed to believe that people from rural India have nothing of value to offer, yet a large portion of today's Indian population lives in the countryside.

I realized that stories like mine were considered the exception and never expected.

We all believe we are born into a reality that we blindly accept until something wakes us up and a new world opens up.

When I saw my mother sign the Bidi Rolling Payroll for the first time, when I felt the hot Delhi air on my face after a 50-hour train journey, when I finally felt free and let myself go, I had a glimpse into the new world I had longed for. It's a world where girls like me are no longer a liability and a burden, but a useful person, a worthy person, a worthy person.

By the time the fellowship ended, my life had changed.

Not only did I track down my lost voice, but I also had the option to help myself.

i was 22 years old.

I returned to my village to establish the Bodhi Tree Foundation, an institution that supports rural youth by providing them with education, life skills and opportunities.

We work closely with rural youth to transform their lives and benefit their communities.

How can I be sure my institution is working?

Well, half a year ago, a new friend joined us.

Her name is Kaviarashi.

I first found her during a training session at a local university in Tirunelveli.

As you can see, she has a smile that will never be forgotten.

We guided her to get the chance to study at Ashoka University in Delhi.

The best part of her story is that she is now back at the Bodhi Tree as a Trainer and dedicated to making a difference in the lives of people like her.

Mildew doesn't want to feel like an exception.

She wants to help other people in this world.

Recently, Ms. Kaviarasi has mentored Ms. Anitha. Anisa, also from a remote rural village, lives in a three-meter-by-three-meter house and her parents are farm workers.

Kaviarasi helped Anitha get into a prestigious undergraduate program at a top Indian university with a full scholarship.

Anitha's parents were reluctant to let her go there, so we asked a district administrator to talk to Anitha's parents and it worked.

And then there's Padma.

Padma and I went to college together.

It will be the first time for her to attend a graduation ceremony for the whole village.

She worked with me at the Bodhi Tree until one day she decided to go to graduate school.

I asked her why.

She said she never wanted to be a burden or burden on anyone at any point in her life.

Padma, Anitha and Kaviarasi grew up in the toughest families and communities you can imagine.

But my journey of finding utility in this world helped them find their utility in this world.

Of course there are challenges.

We know that change doesn't happen overnight.

Much of my work involves working with families and communities to understand why education is beneficial to all.

The easiest way to convince them is to act.

When they see their children getting real education and getting real jobs, they start to change.

The best example of that happened in my house.

Recently, I received an award from the state premier for my social work.

It meant I was on TV.

(Laughter) Everyone was glued to the TV that morning, including my parents.

I'd like to think that seeing my daughter on TV made my mother feel useful too.

I hope she will stop pushing me to get married.

(Laughter) Finding my own use freed me from the identity that society imposed on me, the poor village girl.

Finding my own use allowed me to break free from boxes, cages and jars.

Finding my use allowed me to find my voice, my worth, and my freedom.

I leave you with this thought: where in this world do you feel useful?

Because the answer to that question lies in where you find your voice and your freedom.

thank you.

(applause)

So let's start with Roy Amara.

Roy's argument is that most new technologies tend to overestimate their impact at first and then underestimate it in the long run as we get used to it.

It's truly a day of miracles and surprises.

Remember that great song by Paul Simon?

It had two lines in it.

So what was considered a miracle at the time?

Slowing things down (slow motion) and long distance calls.

Because, of course, in the past the operator would often interrupt me with, "This is a long distance call. Do you want to hang up?"

And now we think nothing of making calls all over the world.

Well, something similar might be happening in your reading and programming life.

But before we unpack it, let's talk a little bit about telescopes.

The telescope was originally overestimated for its impact.

This is one of Galileo's early models.

People thought this would just destroy all religions.

(Laughter.) So we don't pay much attention to telescopes.

But of course, as we just heard, a telescope launched ten years ago could fly this Volkswagen to the moon and see the lights of that Volkswagen come on on the moon.

And it's the kind of resolution capability that allows us to see tiny specks of dust floating around the distant Sun.

Imagine that this is the Sun, a billion light-years away, with a small piece of dust falling in front of it.

This is what happens when you discover an exoplanet.

And the cool thing is that with telescopes now launched, you can see a single candle lit on the moon.

Separated by a single plate, you would see two separate candles at that distance.

And that's the kind of resolution you need to image a tiny dust grain that comes around the Sun and see if it has a blue-green feature.

And if it has a blue-green color, it means life is common in the universe.

When you see a blue-green sign for the first time on a distant planet, it means that there is photosynthesis there, there is water there, and the chances of you seeing the only planet that does photosynthesis are near zero.

And it's an event that changes the calendar.

There is a before and after we are alone in the universe. Forget about discovering continents.

As you think about this, we are now beginning to be able to imagine much of the universe.

And it's a time of miracles and wonders.

And we kind of take that for granted.

Something similar happens in life.

So we are hearing snippets of life.

We hear about CRISPR, we hear about this technology, we hear about this technology.

But the point of life is that life turns out to be a code.

Living as code is a really important concept. Because it means that you are starting to learn to do that in life, just like you can write in English or French or Chinese, just like you can copy sentences, like you can edit sentences, like you can print sentences.

It means that we are beginning to learn how to read this language.

And of course, this is the language this orange uses.

So how does this orange run code?

It doesn't deal with 1's and 0's like a computer does.

It sits on a tree and one day it happens.

It means "run".

AATCAAG: Let me root a little.

TCGACC: Stemm me a little.

GAC: Make a leaf. AGC: Send me flowers.

And GCAA: make some more oranges.

When you edit an English sentence in a word processor, you can go from this word to that word.

If you edit something of this orange and put it into GCAAC using CRISPR or whatever else you've heard of, this orange becomes a lemon, grapefruit, or tangerine.

And if I edit one letter in a thousand, you will be the person sitting next to you today.

Be more careful where you sit.

(Laughter) What's going on with this product is that it was originally very expensive.

It was like a long distance call.

But its cost is falling 50% faster than Moore's Law.

Veritas announced the first $200 complete genome yesterday.

So when you look at these systems, it doesn't matter, it doesn't matter, it doesn't matter, and then it becomes a problem.

Now let's show a map view of this thing.

This is a big discovery.

There are 23 chromosomes.

nice.

Let's start using the telescope version here. But instead of using a telescope, let's use a microscope to zoom in on the subordinate of these chromosomes, the Y chromosome.

It is one-third the size of X. It is recessive and a mutation.

But hey, he's just a man.

And when you're looking at this, this is kind of a view of the country at the 400 base pair resolution level, then you zoom in to 550, then zoom in to 850, and as you zoom in you can start identifying more and more genes.

Then, when you zoom in to the state level, you can see who has leukemia, how they got it, what types of leukemia they have, and what moved from where to where.

Then zoom in to the Google Street View level.

So if a very specific patient has colorectal cancer, what happens in letter-by-letter resolution?

All we do in this space is collect information and generate vast amounts of information.

It's one of the largest databases on the planet and is growing faster than the computers that store it can be built.

You can use it to create great maps.

Do you want to understand the plague and why one is bubonic plague, another is another kind of plague, and the other is another kind of plague?

Well, here is the map of the plague.

Some are completely deadly to humans, some are not.

By the way, if you read this all the way through, notice how it differs from tuberculosis.

This is the difference between tuberculosis and various kinds of plague, and you can use it to play detective. Because we can look up the very specific kind of cholera that affected Haiti, and find out which country it came from, what region it came from, and perhaps which soldiers brought it to Haiti from an African country.

zoom out.

Don't just zoom in.

This is one of the coolest maps mankind has ever created.

What they've done is collect all the genetic information they have for every species and put the tree of life on a single page that you can zoom in or zoom out.

Here's a one-page summary of what it did in the first place, how it diversified, how it diverged, and how big its genome is.

It is like the universe of life on Earth, constantly being renewed and perfected.

Looking at this, the really important change is that old biology was reactive.

There used to be a lot of biologists with microscopes and magnifying glasses, observing animals.

New biology is aggressive.

We don't just observe things, we create things.

This is a really big change because it allows us to do things like this.

And I can see that you are really excited about this photo.

(Laughter) It took me only four years and $40 million to take this picture.

(Laughter) And what we've done is we've taken the complete genetic code out of the cell -- not one gene, not two genes, but the complete genetic code out of the cell -- built a whole new genetic code, put it into a cell, figured out a way to make the cell run that code, built a whole new species.

In other words, this is the world's first synthetic life form.

So what do you do with this?

Well, this is going to change the world.

In terms of how the world is changing, I would like to highlight three short-term trends.

The first is that there will be a new industrial revolution.

And I actually mean it literally.

So just as Switzerland, Germany, and the UK have changed the world and created power with machines like the ones you see in this lobby, just as CERN is changing the world with new devices and our conception of the universe, programmable life forms will change the world. Because if you can program cells the same way you program computer chips, you can make almost anything.

So computer chips can make pictures, make music, make movies, write love letters, and create spreadsheets.

Only 1's and 0's fly around.

If you can run ATCG on a cell, this software will be building its own hardware and will scale very quickly.

No matter what happens, if you leave your phone by your bedside, you won't have a billion phones in the morning.

But if you do this with living organisms, you can build something very large.

One thing you can do is start producing near-carbon-neutral fuels on a commercial scale by 2025. We are working with Exxon on this.

But it can also be used instead of farmland.

Instead of having 100 hectares of space for oil production or protein production, these tanks can achieve 10 or 100 times the productivity per hectare.

Alternatively, you can store information or manufacture vaccines for the world in these three tanks.

Alternatively, most of the information stored at CERN could be stored in these three bins.

DNA is a very powerful information storage device.

Turn 2: The rise of theoretical biology is beginning to emerge.

Medical schools are therefore one of the most conservative places on earth.

The way they teach anatomy is similar to the way anatomy was taught 100 years ago.

"Welcome, student. Here is your corpse."

One of the areas medical schools struggle with is creating new departments, which is unusual.

Isaac Kohane now founded the Department of Informatics, Data and Knowledge at Harvard Medical School.

And, in a way, what's starting to happen is that biology is starting to get enough data to go back in the steps of physics that used to be observational physicists and experimental physicists, and then to create theoretical biology.

Well, we're starting to see that because there are so many medical records and so much data about people. We know the genome, the virus, the microbiome.

And once this information stacks up, you can start making predictions.

The third thing that's happening is this reaching the consumer.

Therefore, you can sequence your own genes too.

Companies like 23andMe are starting to pop up. Companies like 23andMe will give you more and more data about you and your body, not just your relatives. And it will compare things, compare things across time, and these will be very large databases.

But it's also starting to affect other lines of business in unexpected ways.

Usually, when you advertise something, you don't want the consumer to take the ad to the bathroom and pee.

Except for IKEA, of course.

Because if you cut it out of a magazine and pee, it turns blue when you're pregnant.

(laughter) And they'll give you a discount on the crib.

(laughs) Right? So when I say consumer empowerment, which extends beyond biotechnology, I really mean it.

Synthetic Genomics is now manufacturing desktop printers that can design, print, and run programs on cells.

Vaccines can now be printed in real time as the plane takes off before landing.

We will be shipping 78 of these machines this year.

This is not theoretical biology. This is print biology.

Let's talk about two long-term trends that will hit you over a longer period of time.

The first is that we are starting to redesign species.

Have you heard about it?

Redesigning trees. We are redesigning the flower design.

We're redesigning yogurt, cheese, and everything else.

And of course that raises an interesting question: when and how should humans be redesigned?

And many of us are thinking, "Oh, I don't want to redesign humans."

Unless, of course, your child carries the Huntington's gene and is sentenced to death.

Or, unless you inherited the cystic fibrosis gene, in which case you would not only want to redesign yourself, but you would also like to redesign your children and their children.

These are complex discussions that will take place in real time.

Here's one current example.

One of the debates going on in the National Academy today is the power to put gene drives into mosquitoes to kill all malaria-carrying mosquitoes.

Now, some people say, "Please stop doing that because it will have an extreme impact on the environment."

Some say, "This is one of the millions of people who die each year."

Who are you that I cannot save the children of my country? ”

And why is this discussion so complicated?

Because as soon as you leave this alone in Brazil or southern Florida the mosquitoes will ignore the wall.

When you launch your gene drive into the air, you make decisions for the world.

This wonderful man won the Nobel Prize. After winning the Nobel Prize, I worry about how life began on this planet and how likely it is that it exists elsewhere.

So what he's been doing is going around these grad students and saying, "Build me a life, but don't use any of the latest chemicals and equipment."

Build what was here 3 billion years ago.

Laser is not available. This is not allowed. you can't use that. ”

He gave me a vial of something he made about three weeks ago.

what did he build?

He basically created something like a soap bubble made out of lipids.

He constructed the precursors of RNA.

He had the precursors of RNA absorbed into cells, which then divided.

We may take 10 or 20 years to create life from scratch from a primitive community.

Second long-term trend: We have lived and are living in the digital age. We are beginning to live in an age of genomics and biology, CRISPR and synthetic biology, all of which will converge in the age of the brain.

In other words, we are reaching the stage where most parts of our bodies can be rebuilt in the same way that broken bones and skin burns regenerate.

We are beginning to learn how to regenerate the trachea and bladder.

Both have been transplanted into humans.

Tony Atala works on 32 different organs.

But the core is this. Because this is you and the rest is just packaging.

No one can live beyond 120, 130, 140 years until this is resolved.

And that is the most interesting challenge.

It's the next frontier, alongside "How common is life in the universe?"

"Where are we from?"

and such questions.

I would like to end this with a false Einstein quote.

[You can live like everything is a miracle, or you can live like nothing is a miracle. ] It's your choice.

You can focus on the bad, or you can focus on the scary. There are certainly a lot of scary things out there.

But focus 10 percent, or 20 percent, or 30 percent of your brain.

But remember, we truly live in a time of miracles and wonders.

We are lucky to be alive today. We are lucky to see this.

I'm lucky to interact with people like the people who build everything in this room.

Thank you for all your hard work.

(applause)

We know about the past of the universe. The Big Bang theory predicts that all matter, time and space began in an incredibly small and compact state about 14 billion years ago.

And we know about the present. Scientists' observations of the motion of galaxies show that the universe is expanding at an accelerated rate.

But what about the future?

Do you know how our universe will end?

Cosmologists have three possible answers to this question, called the Big Freeze, Big Rip, and Big Crunch.

To understand these three scenarios, imagine two objects representing galaxies.

A short, tight elastic band holds them together. This is the gravitational pull.

Meanwhile, two hooks are pulling them apart. This is the repulsive force that expands the universe.

Copy this system many times and you get something close to the real universe.

The outcome of the battle between these two opposing forces will determine what the end of the universe will be.

The Big Freeze scenario occurs when the force pulling objects apart is strong enough to stretch the rubber band until it loses its elasticity.

The expansion cannot accelerate any further, but the universe will continue to expand.

The galaxy cluster will separate.

Objects within the galaxy—the sun, the planets, and the solar system—moved away from each other, and eventually the galaxy melted into separate, solitary objects floating in vast expanses of space.

The light they emit will be red-shifted to long wavelengths with very low faint energies, and the gas they emit will be too thin to form new stars.

The universe is getting darker and colder, approaching a frozen state known as the Big Chill, or cosmic heat death.

But what if the repulsive force is so strong that the rubber band stretches beyond its elastic limit and actually breaks?

If the expansion of the universe continues to accelerate, we will eventually overcome not only the gravitational forces that tear galaxies and solar systems apart, but also the electromagnetic, weak, and strong nuclear forces that hold atoms and nuclei together.

As a result, the material that makes up the star shatters into tiny pieces.

Even atoms and elementary particles are destroyed.

That's the big lip.

What about the third scenario where the rubber band wins?

This corresponds to a possible future where gravity stops the expansion of the universe and then reverses it.

The galaxies begin to rush towards each other, and the gravitational pull gets stronger as they come together.

The stars will also rush along and collide.

The temperature will rise as the space becomes smaller and smaller.

The size of the universe will plummet until everything is compressed into so little space that even atoms and subatomic particles will have to collide with each other.

The result would be an incredibly dense, hot, and compact universe resembling the state before the Big Bang.

This is the big crunch.

Could this tiny point of matter explode in another Big Bang?

Will the universe expand and contract, repeating its entire history?

A theory that explains such a universe is known as the Big Bounce.

In fact, we have no way of knowing how many bounces have already occurred, or how many are likely to occur in the future.

Each bounce erases all previous records of the universe's history.

Which of these scenarios would be the real one?

The answer depends on the exact shape of the universe, how much dark energy it holds, and changes in its rate of expansion.

At this time, our observations suggest we are headed for a major freeze.

But the good news is that there's probably a period of 10 to 100 power years before the cold really hits. So don't start stocking up on gloves just yet.

A few years ago a fact came out from MIT. Linguist Ken Hale said 3,000 of the 6,000 languages ​​spoken on earth today are not spoken by children.

So in one generation we will halve our cultural diversity.

He went on to say that every two weeks an elder would go to the grave with the last spoken word of that culture.

So the whole philosophy, the body of knowledge about the natural world that has been empirically collected over the centuries, disappears.

And this happens every two weeks.

So, over the past 20 years, since my experience in dentistry, I have traveled the world and brought back the stories of these people.

What I want to do now is share some of those stories with you.

I'm Tamudin.

She is a 69 year old nun.

She was imprisoned in Tibet for two years for holding up a small placard protesting the occupation of her homeland.

And when I met her, she had just walked 30 days from the Tibetan capital, Lhasa, across the Himalayas, into Nepal, and across India to meet her leader, the Dalai Lama.

The Dalai Lama lives in Dharamsala, India.

So I took this photo 3 days after she arrived. She wore tattered tennis shoes with her toes sticking out.

And she crossed in March, and there's a lot of snow at 18,500 feet in March.

It's Paldin.

Paldin is a 62-year-old monk.

And he spent 33 years in prison.

During the rebellion that forced the Dalai Lama to leave Tibet, his entire monastery was imprisoned.

And in prison he was beaten, starved, tortured and lost all his teeth.

And when I met him, he was a very kind and gentle old man.

And I met him two weeks after he got out of prison, and I was really impressed with how he went through that and ended up with that attitude.

So I met these people in Dharamsala, and spent about five weeks there, hearing similar stories of refugees pouring into Dharamsala from Tibet.

Then, coincidentally, during the fifth week, there was a public teaching by His Holiness the Dalai Lama.

And I was looking at this crowd of monks and nuns, many of whom I had just interviewed, listening to them, looking at their faces. And they gave us a little FM radio so we could listen to the translation of his teachings.

And he said, "Treat your enemies as if they were jewels, because they are the ones who cultivate your tolerance and patience on the path to enlightenment."

When I spoke to people who had this experience, I was shocked.

So, two months later, I entered Tibet and started interviewing people there and taking pictures. that's what i do.

I do interviews and portraits.

And this is a little girl.

I took her portrait at the top of Jokhang Temple.

I was going to sneak in because it's completely illegal to have a photo of the Dalai Lama in Tibet. Because it's the fastest way to get arrested.

So I slipped a lot of wallet-sized pictures of the Dalai Lama and handed them out.

And when I gave it to people, they would either hold it to their chest or hold it near their head and just stay there.

This was 10 years ago when I did this, which was 36 years after the Dalai Lama left.

So I went in, interviewed them, took portraits of them.

This is Jigme and his sister Sonam.

They live on the Tibetan Plateau, Changtang, in the western part of the country.

We're at 17,000 feet here.

And they had just come down from the high pastures at 18,000 feet.

Same thing: I gave her a photo and she held it up to her forehead.

I set up lights and check lights, so whenever I do something like this I always hand out Polaroids. When I showed her the Polaroid, she screamed and ran into the tent.

My name is Tenzin Gyatso. When he was two years old, he was discovered to be the Buddha of Compassion in a remote rural farmer's home.

At the age of four, he became the 14th Dalai Lama.

As a teenager, he was the leader of his country and had to face an invasion of his homeland and deal with it.

Eight years later, when they learned of their plans to kill him, they disguised him as a beggar and smuggled him out of the country on horseback, making the same journey as Tamudin.

And since then he has never returned to the country.

And think of this man, 46 years later, who continues to respond non-violently to serious political and human rights issues.

And young people, young Tibetans, are starting to say, listen, this is not going to work.

As you know, violence as a political tool is all the rage right now.

And he still sticks to this line.

So this is a symbol of non-violence in our world, one of our living symbols.

This is also another leader of his people.

I'm Moi. This is the Ecuadorian Amazon.

And Moi is 35 years old.

And in this region of the Ecuadorian Amazon, oil was discovered in 1972.

And during this period, since then, as much or twice as much oil has spilled into this small part of the Amazon as was spilled in Exxon Valdez, forcing tribes in the region to constantly move.

The Moi belong to the Huaorani tribe and are known to be very ferocious and are known as 'Awka'.

And they managed to keep out seismologists and oil workers with spears and blowguns.

And we, myself as part of the team, spent two weeks with them watching them hunt in the jungle.

This was a monkey hunt, and they hunted with curare-tipped arrows.

And the knowledge these people have about the natural environment is incredible.

They could hear things, smell things, see things I couldn't see.

And I didn't even see the monkeys they were catching with their darts.

This is Yadira, Yadira is 5 years old. She lives in a tribe adjacent to the Waorani tribe.

And her tribe has been forced to move three times in the past decade because of oil spills.

And we never heard of that. And the latest offense against these people is spraying paraquat and Roundup as part of Plan Columbia. Whatever it is, we are clearing thousands of acres of the Ecuadorian Amazon in our fight against drugs.

And it is these people who bear the brunt of it.

It's Mengato.

He was a Huaorani shaman and he told us: I'm tired. I'm tired of spearing oil workers.

I wish they were gone.

And I—I always travel alone when I work, and this time I did—hosted the Discovery program, but when I went with the team, I was really worried about going with a lot of people, especially deep into the Huaorani.

And after all that, they really taught me a few things about blending in with the locals.

(Laughter) One of the things I did just before 9/11, in August of 2001, was take my son Dax, who was 16 at the time, to Pakistan.

Because I took him on a few trips, which was my initial desire, to see people living on less than a dollar a day.

I wanted him to gain experience in the Islamic world, and I wanted him to - I was going to work with a group and go there to write a story about a group called the Kalash. A group of animists, inhabited by 3,000 animists - in a very small area - surrounded by Islam - 3,000 remain of this Kalash. they are incredible people.

So it was a great experience for him. He stayed up all night playing drums and dancing with them.

And he brought a soccer ball and we played soccer every night in this little village.

Then we went up and met their shaman.

By the way, Mengatou was also a shaman for his tribe.

And this is John Dourikhan, the Kalash shaman.

And he's on a mountain near the border with Afghanistan.

In fact, on the other side is a region called Tora Bora, where Osama bin Laden is believed to be. This is a tribal area.

And we watched and spent time with John Doolikhan.

And shamans -- I've done a whole series on shamanism, and it's an interesting phenomenon.

But all over the world they go into a trance in different ways, and the way in Pakistan is to burn a juniper leaf, sacrifice an animal, pour the animal's blood on the leaf, and breathe its smoke.

And they are all praying to the mountain god while going into a trance.

I think it is very important to familiarize children with different realities. What Dan Dennett said the other day -- that we have curricula of different religions just to increase mental flexibility, and give mental flexibility to different belief systems -- I think this is sorely needed in our world today, where beliefs clash like this.

And any security issues they cause us.

So one of the things we did five years ago was start a program that connects children in Indigenous communities with children in the United States.

So we first connected a Navajo location with a classroom in Seattle.

There are currently 15 sites.

There is also one in Kathmandu, Nepal. Dharamsala, India. Takaung, Kenya -- Takaung is one-third Christian, one-third Muslim, and one-third animist, and its communities are Ollantaytambo, Peru and Arctic Village, Alaska.

This is Daniel. He is one of the students at Arctic Village, Alaska.

He lives in this log cabin. There is no running water or heating other than the windows and a high speed internet connection.

And this -- you can see this rolling out here and there -- this is our site in Ollantaytambo, Peru, four years ago. This is where they first saw their first computer. We now have computers in our classrooms.

The way we've done this is by teaching kids digital storytelling.

Then ask them to speak in their communities about community issues they care about.

This was Peru, and the children told stories about the river they cleaned.

The way we do it is by doing it in workshops and bringing people who want to learn about digital workflows and storytelling to work with kids.

And just last year we took in a group of teenagers and this worked best.

Therefore, our dream is to bring together a group of teens to teach children these areas and help them build communication infrastructure while having not only a community service experience but also a cross-cultural experience.

This person teaches Photoshop at the Tibetan Children's Village in Dharamsala.

We have a website and every child can get their own home page.

That's all of their movies. There are about 60 movies made by these kids, and they're pretty good.

What I want to show you is to have them make a movie and then spend the night showing it to the community.

This is in Takaung. They have a generator and a digital projector that they project into the barn to show one of the movies they made.

If you have the chance, please visit our website to see the wonderful work our children do.

Another thing is that I wanted to give the indigenous people a voice.

That was one of the big motivations.

But another motivation is the closed nature of our country.

National Geographic conducted a Roper survey of 18- to 26-year-olds in Japan and nine other developed countries.

It was a $2 million study.

The United States ranked second to last in geographic knowledge.

70% of the children could not find Afghanistan or Iraq on the map. 60% could not find India. 30% could not find the Pacific Ocean.

And this is a study that was just done a few years ago.

So, in the last few minutes, I want to show you a film made by a Guatemalan student.

We just opened a workshop in Guatemala.

A week before we arrived at the workshop, 600 people were buried alive in the village after a massive landslide caused by Hurricane Stan last October.

And this kid lived in that village -- he wasn't in the village at the time -- and this is a little movie he put together about it.

And he had never even seen a computer before we made this movie. We taught him Photoshop. Then I was able to play it.

This is an old Mayan funeral chant he received from his grandfather.

thank you very much.

(applause)

Hello, good evening, anything is fine.

Jumbo, Guten Abend, Bonsoir, you can go, but you can also say oh, oh, oh, oh, oh, oh, oh, oh, oh.

This is the sound chimpanzees make at night before they go to sleep.

The sound is heard from one side of the valley to the other, from one group of nests to the next.

And my talk tonight will pick up where Zerai left off yesterday.

He was talking about Serum, this amazing Australopithecus 3-year-old.

And we have also heard about human history, genealogy through DNA genetic profiling.

And it was the late paleontologist Louis Leakey who really got me on the path to chimpanzee research.

And it was pretty insane at the time.

Now it's a commonplace story, but he claims—he was looking for the fossilized remains of early humans in Africa.

And we can tell a great deal about what those creatures looked like from the shape of the fossils and muscle attachments, and something about their lives from the various artifacts found together.

But how were they behaving? That's what he wanted to know.

And, of course, behavior is never fossilized.

He argued, which is now a fairly common theory, that if similar or identical patterns of behavior were found in our closest extant relatives, the great apes, and present-day humans, perhaps those behaviors could have existed in ape-like, human-like ancestors about 7 million years ago.

So perhaps we brought those traits from that old, old past.

Now, if you look at today's textbooks on human evolution, very often people make assumptions about how early humans behaved based on the behavior of chimpanzees.

They are more like us than any other creature, and we heard about it at this TED conference.

So it remains for me to comment on how chimpanzees are very similar to us in certain aspects of their behavior.

Each chimpanzee has its own unique personality.

Of course I gave it a name. They can live over 60 years, but most probably do not live to 60 in the wild.

Ursel. Females give birth to their first offspring at the age of 11 or 12.

After that, she only gives birth to one baby every five or six years, and for a long time depends on childhood when the child is breastfeeding, sleeping with her mother at night or riding her mother's piggyback ride.

And we believe that this long childhood is as important for chimpanzees as it is for us when it comes to learning.

As brains become more and more complex during the evolution of different forms of animals, we find that learning plays an increasingly important role in individual life histories.

And young chimpanzees spend a lot of time observing the behavior of their elders.

We now know that we can imitate the behavior they see.

And we believe that in this way the different tool-using behaviors found in all the different chimpanzee populations studied in Africa are passed down from generation to generation through observation, imitation and practice, allowing us to explain these tool-using behaviors as primitive cultures.

Chimpanzees do not have a spoken language. We talked about it.

They have a very rich repertoire of poses and gestures, many of which are similar to ours and formed in the same context. The chimpanzees hug and greet each other.

They also kiss, hold hands, and pat each other on the back.

And they swagger and throw stones.

So many pioneering examples of compassion, love, and true altruism can be found in chimpanzee society.

Unfortunately, they, like us, have a darker side to their nature.

They are capable of extreme atrocities and even a kind of primitive warfare.

And these truly aggressive behaviors are most often directed against individuals from neighboring social groups.

They are very territorial.

I believe that chimpanzees, more than any other creature, have helped us understand that, after all, there is no clear line between humans and the rest of the animal kingdom.

It's a very blurry line, and it always gets blurrier with more observations.

Research that began in 1960 continues today.

And the wild and complex social lives of chimpanzees have, above all, made us realize that we are not separate, part of the wonderful animals with which we share the earth.

It is therefore very sad to learn that chimpanzees, like many other creatures around the world, are losing their habitat.

This is just one photo taken from the air, showing the forested highlands of Gombe.

And about 16 years ago, when I flew over the area and noticed that this forest outside the park stretched almost uninterrupted along the eastern shore of Lake Tanganyika in 1960, where the tiny 30-square-mile Gombe National Park was, a question arose in my mind.

"How can we try to save this famous chimpanzee when the people living around the national park are struggling to survive?"

More people live there than the land can support.

Their numbers were boosted by the influx of refugees across the lake from Burundi and Congo.

And very poor people could not afford to buy food from other places.

This led to a program called TACARE.

This is a very holistic way of improving the lives of the people living in the villages around the park.

It started with 12 villages. I am 24 now.

I don't have time to go into detail about this, but it includes things like nurseries and farming methods best suited to the now very desolate, almost desert-like mountainous lands.

Methods of controlling and preventing soil erosion.

A method of reusing overused agricultural land so that it can be produced again within two years.

Activities that help villagers obtain fresh water from wells.

We will probably build some classrooms.

I believe the most important thing is to work with small groups of women and provide them with micro-loan opportunities.

And, similar to examples around the world, about 95 percent of all loans have been repaid.

With a clear understanding that family sizes are shrinking as women's education improves around the world, we empower women, focus on education, and provide scholarships to help girls graduate from secondary school.

Provides information on family planning and HIV/AIDS.

And something is happening for conservation as a result of this program.

What's going on for conservation is that the farmers in these 24 villages don't see us as a bunch of white people coming to study the monkey herds, by the way, many of the staff are now Tanzanians. But when we started the TACARE program, it was a team of Tanzanians entering the village.

It was the Tanzanian team talking to the villagers and asking them what they were interested in.

Were they interested in conservation? Absolutely not.

They were interested in health. They were interested in education.

And as time went on and the situation began to improve, they began to understand more and more about the need for protection.

They began to understand that this terrible soil erosion and landslides were occurring because the upper layers of the hill were devoid of trees.

Currently, we are developing what we call the Great Gombe Ecosystem.

This is far outside the national park and spreads over a very degraded land.

And these villages have actually agreed to set aside 10 to 20 percent of the land in the highlands, as living standards have improved. Then, as trees grow again, there will be lush pathways through which chimpanzees can travel to interact with other groups remaining outside the park (as is necessary for genetic survival).

In other words, TACARE was a success.

We are replicating it in other parts of Africa, other natural areas facing extreme population pressure.

But as we've been discussing throughout the first few days of TED, Africa's problem is a big one.

There is so much poverty.

And when large numbers of people live on less fertile land, especially when they cut down trees and leave the soil exposed to the wind and eroding, what happens as desperate people cut down more and more trees to make food for themselves and their families? I have to give something.

And the other question is, what are we doing to the planet, not only in Africa, but in other developing countries, and indeed everywhere?

As you know, the famous scientist E.O. Wilson said that if everyone on this planet were to reach the standard of living of the average European or American, we would need three new planets.

I say four today. But we don't have them. There is one.

So what happened? So the problem here is that we are probably the most intelligent beings that have ever walked on the planet, and despite having this extraordinary brain and the kind of technological prowess that TED conferences often demonstrate, we are destroying our only home.

Indigenous peoples around the world sat and asked themselves before making a big decision. “How will this decision affect our people seven generations from now?”

Today, important decisions, I'm not specifically talking about Africa here, but for developed countries, important decisions involving millions of dollars and millions of people, are often based on, "How will this affect the next shareholder meeting?"

And these decisions will affect Africa.

As I began traveling across Africa talking about the problems facing chimpanzees and forests that were dying out, I realized more and more that so many of Africa's problems were at the doorstep of past colonial exploitation.

So I started traveling outside of Africa, speaking in Europe, speaking in America, going to Asia.

And everywhere there were horrible problems like this.

And you know the kind I'm talking about. I'm talking about pollution.

The air we breathe often poisons us.

The earth is polluting our food.

Water is perhaps one of the most important problems we will face in this century. Water everywhere is polluted by agricultural, industrial and household chemicals still being sprayed around the world that seem unable to benefit from past experience.

Mangroves are cut down. The effects of tsunamis, etc. will be even worse.

We talked about soil erosion.

The reckless burning of fossil fuels and other greenhouse gases is leading to so-called climate change.

Finally, people around the world are beginning to believe that something very wrong is happening with the climate.

Climates around the world are mixed.

And it is the poor who are most affected.

Africa is already affected.

Drought is becoming more severe in many parts of sub-Saharan Africa.

And when it rains, it all too often triggers a cycle of floods and more suffering, poverty, hunger and disease.

And the number of people who live in areas where the land cannot support them, who are too poor to buy food, who cannot move because the whole land is in ruins.

And as the last trees are cut down, desertification is creeping, creeping, creeping.

And this kind of thing is not just in Africa. it is all over the world.

So it was not surprising to me that, in my travels around the world, I met many young people who seemed to have lost hope.

We seem to have lost our wisdom, our indigenous wisdom.

I asked. "why?"

Well, do you think there might be some sort of disconnect between this very smart brain, the brain represented by TED technology, and the human mind? Are there any disconnections?

And when I spoke to these young people, they were basically either depressed or apathetic or bitter and angry. And they said more or less the same thing, "We feel this way because we feel you have put our future in jeopardy and there is nothing we can do about it."

We put their future in jeopardy.

I have three little grandchildren and I feel this despair every time I look at them and think about how much I have done to this beautiful planet since I was their age.

And that led to this program we call Roots and Shoots. The program started here in Tanzania and has now spread to 97 countries around the world.

It's iconic. Roots create a solid foundation.

Shoots look small. To reach the sun, you can break through brick walls.

See brick walls as all the environmental and social problems we have caused on our planet. It's a message of hope.

Hundreds and thousands of young people around the world can change this situation and create a better world for all living things.

The overriding message of Roots and Shoots is that each of us makes a difference every day.

we have a choice. All of us in this room have choices about what changes we want to make.

The poor have no choice. It is up to us to change the situation so that even the poor have options.

The Roots and Shoots group will all choose three projects.

What kind of project they do depends on how old they are, what country they are in, city or country.

But basically there are now kindergarten through college programs, and more and more adults are starting their own Roots and Shoots groups.

And all groups, recognizing that all these different issues are interconnected and affecting each other, choose three different kinds of projects to make this world a better place.

So one of their projects will be to support their own human community.

And where possible, we may raise funds to help communities in other parts of the world.

One of their projects is helping animals, both wild and domestic.

And one of their projects is to help the environment we all share.

And woven into all of this is the message of learning to live in peace and harmony within ourselves, within our families, within our communities, between nations, between cultures, between religions, and between us and the natural world.

We need the natural world. We cannot continue to destroy it.

We don't have more than this one planet.

Here in Africa, just name one or two projects that the Roots and Shoots Group is doing in Tanzania, Uganda, Kenya, South Africa, Congo-Brazzaville, Sierra Leone, Cameroon, and other groups. And like I said, it's in 97 countries around the world.

Of course they are planting trees. They grow organic vegetables.

They raise chickens in refugee camps and sell their eggs for a small amount of money, or work with chickens to feed their families.

It is used in Uganda to provide psychological support to ex-child soldiers.

Doing a project like this liberates them.

Again, they are helpful social people.

Even prisons have this program.

So no more time for roots and shoots.

But oh, they're also working on HIV/AIDS.

This is a very important element of Roots and Shoots, where older children speak to younger ones.

And about things like unwanted pregnancies, young people hear more from other young people than from adults.

hope. That's the question I get asked while traveling around the world. "Jane, you've seen so many terrible things. You've seen chimpanzee numbers drop from about a million early in the century to just 150,000 today, but so do many other animals.

The forest is disappearing, and the place where the forest used to be is the desert.

do you really have hope? " I agree.

You can't come to a conference like TED and be hopeful, right?

And, of course, there is hope. One is this amazing human brain.

So let's think about technology.

And I'm so excited to finally be here where people are talking about composting toilets.

One of my favorite horses.

Just flush all this water down the toilet, but it's awful.

And talk about renewable energy. This is very important.

Are we thinking of the planet for our children?

How many children, grandchildren, nieces and nephews do you have?

do we care about their future?

And if their future is a concern, we, as elites around the world, should be able to do something about it, too. We can choose how we live each day.

what we buy. what we wear.

And choose to make these choices with the question of what effect this will have on my surroundings.

What effect will it have on the child's life when he/she grows up?

Or my grandchildren, or whatever it is.

Human brains and human hearts, and we all go hand in hand around the world.

And that's something that TED is helping very well, Google to help us, and Esri to help map Gombe National Park.

All these technologies are available to us.

Now let's link them, it's starting to happen, isn't it?

You may have heard about it this afternoon. It's starting to happen.

This change, this change. To understand that if we think about the future, we must change.

And the next reason for hope is that nature is amazingly resilient.

A completely destroyed area can be regenerated with time and perhaps some help.

One example is the TACARE program.

As I said earlier, if you stop clearing a seemingly dead tree stump for firewood (you don't have to because you have woodland), in five years you'll have a 30 foot tree.

And even animals on the verge of extinction are given a second chance. That's my next book.

It's impressive. And that brings me the last category of hope, and we've heard a lot about this in the last two days, it's the indomitable human spirit. It is this determination, the resilience of the human spirit, that enables people who are thought to be overwhelmed by poverty, disease, etc. to rise from it, sometimes with a helping hand, to participate in society and to change the world.

And I think there is one or two people from Africa who really inspire me.

I could make a very long list, but apparently Nelson Mandela, after 17 years of hard labor and 23 years of imprisonment, was able to rise with his amazing ability to forgive and lead his people out of the evil regime of apartheid without bloodshed.

Ken Saro Wiwa of Nigeria has been executed despite the best efforts of people all over the world, fighting the oil giants.

People like this are very inspirational.

People like this are the role models we need for African youth.

And we also need environmental role models, some of which I've heard today.

So I really appreciate this opportunity to share this message again with everyone at TED.

And I hope some of us can get together and discuss these things, especially the Roots and Shoots program.

One last word, today I met the young lady who runs this entire conference center.

She came in very excited with her certificate. She was in Roots and Shoots.

She was in the leadership of Dar es Salaam.

She said it helps her do what she does.

And I was so, so, so excited to meet her and see an example of how young people are empowered and given the opportunity to take action to make the world a better place, a true hope for our tomorrow.

thank you.

(applause)

Suppose two American friends are traveling together in Italy.

The two go to see Michelangelo's "David", and when they finally meet the statue, they both freeze to death on the way.

The first man -- I'll call him Adam -- is riveted by the beauty of the perfect human figure.

The second man - I'll call him Bill here - freezes in embarrassment as he stares at the object in the middle.

So here's the question. Which of these two people was more likely to vote for George Bush and who was more likely to vote for Al Gore?

No need to raise your hand because we all have the same political stereotypes.

Everyone knows it's Bill.

And in this case the stereotype corresponds to reality.

It is true that liberals far outperform conservatives in a key personality trait called openness to experience.

People who are highly open to experience crave novelty, variety, variety, new ideas, and travel.

People with low emotions prefer things that are familiar, safe and trustworthy.

Knowing this trait helps us understand many mysteries of human behavior, such as why artists and accountants are so different.

You can predict what kind of books they like to read, what kind of places they like to travel to, what kind of food they like to eat.

Once you understand this feature, you can understand why everyone eats at Applebee's but not everyone you know.

(Laughter) This trait also tells us a lot about politics.

"Open people have an affinity for liberal, progressive, and left-wing political views..." says Robert McCrae, the principal researcher of this trait.

They prefer open and changing societies, "whereas closed individuals prefer conservative, traditional and right-wing views."

This feature also tells us a lot about what groups people are in.

Below is a description of the group I found on the web.

Who would join "a global community that welcomes people from all walks of life and cultures who seek a greater understanding of the world and want to transform that understanding into a better future for all of us"?

This is from a man named Ted.

Well, let's see.

If openness predicts who will be liberal, and openness predicts who will be a TED star, can we predict that most TED stars will be liberal?

Let's check.

Whether you're liberal, center-left, left-mostly on social issues, or conservative, raise your hand.

I know there are liberals in the audience, so I offer the third option.

Please raise your hand in the simulcast room.

Let everyone see who's here.

Raise your hand if you say you are liberal or center-left.

Raise your hands high now. OK.

Raise your hand if you say you are a libertarian.

OK. About two dozen.

And if you say you're center-right or conservative, raise your hand.

1, 2, 3, 4, 5, 8 or 10.

OK。

Because if our goal is to understand the world more deeply, our lack of moral diversity here makes it even harder.

Because when people all share values ​​and all share morals, they become a team.

And once the mentality of the team is affected, open-minded thinking becomes blocked.

As it was in 2004, and almost as it was in 2000, we console ourselves when the liberal team loses to [United States Canada/Jesusland].

(Laughter) We're trying to explain why half the Americans voted for the other team.

We think they must be blinded by religion [post-election US map: America / Dumbf\*ckistan] or simple stupidity.

(Laughter) (Applause) (Laughter) If you think half of America is voting Republican because they're blinded like this, my message to you is that you're trapped in a moral matrix, a particular moral matrix.

'Matrix' literally means Matrix like in the movie 'The Matrix'.

But I am here today to give you a choice.

You can take the blue pill and stick to your comforting delusions, or you can take the red pill and study moral psychology to step outside the moral matrix.

Now that I know -- (applause) I think that answers my question.

I was going to ask you which one you chose, but there was no need.

You are gourmets with a high tolerance for experience and a taste for it.

Anyway, let's take the red pill, study moral psychology, and see where that takes us.

Let's start from the beginning: what is morality and where does it come from?

The worst idea in all of psychology is that your mind is a blank slate when you are born.

According to developmental psychology, children are born into this world already knowing a lot about the physical and social world, and are programmed to make it very easy to learn certain things and hard to learn others.

The best definition of congenital I've seen so far, which reveals so much to me, is by brain scientist Gary Marcus.

“The initial organization of the brain is not very dependent on experience,” he said.

Nature provides an initial draft, then experience is revised.

"Built-in" does not mean inflexible. It means being organized prior to experience. ”

So what is written in the first draft of Morality?

To find out, my colleague Craig Joseph and I read the literature on anthropology, cultural differences in morality, and even evolutionary psychology, looking for matches. What are people talking about across disciplines, across cultures and even species?

We found the five best matches, which we call the Five Foundations of Morality.

The first is harm/care.

We are all mammals here, and we have many neural and hormonal programs that make us truly bond with others, care for others, and feel compassion for others, especially the weak and vulnerable.

It gives us very strong feelings towards those who harm us.

This moral foundation underlies about 70 percent of the moral statements I hear here at TED.

The second foundation is fairness/reciprocity.

While the evidence for reciprocity in other animals is actually equivocal, the evidence for humans is even clearer.

This Norman Rockwell painting is called The Golden Rule. As we heard from Karen Armstrong, this is the basis of many religions.

This second foundation underlies the remaining 30 percent of the moral statements I hear here at TED.

The third foundation is intragroup/loyalty.

Cooperative groups exist in the animal kingdom, but these groups are always either very small or all siblings.

It is only among humans that we see very large groups capable of cooperating and joining groups, but in this case, groups banded together to fight other groups.

This probably comes from our long history of tribal life and tribal psychology.

And this tribal mentality is so much fun that even when you don't have a tribe, you create a tribe because it's fun.

(Laughter.) Sports and war are the same as porn and sex.

We can exercise some ancient impulses.

The fourth base is authority/respect.

Here we see a docile gesture between two very closely related species.

But human authority is not as closely based on power and brutality as it is in other primates.

It is based on an element of more spontaneous respect and sometimes love.

The fifth foundation is purity/holiness.

The painting is called "The Allegory of Chastity", but purity does not only mean the suppression of female sexuality.

It's about all kinds of ideologies, all kinds of ideas that virtue can be achieved by controlling what you do with your body and what you put into it.

And while the political right may moralize sex more, the political left moralizes more about food.

Food is becoming extremely moralized these days.

A lot of it is about purity, ideas about what you want to touch and what you want to put into your body.

I believe these are the five best candidates for what is written in the first draft of morality.

I think this is what we have, preparation to learn all this.

But how will this first draft revise as his son Max grows up in a liberal college town?

And how will that ultimately differ from children born 60 miles south of us in Lynchburg, Virginia?

Let's try another metaphor to think about cultural diversity.

If the mind actually has five systems at work, five sources of intuition and emotion, then the moral mind can be thought of as an audio equalizer with five channels, each of which can be set to different settings.

My colleagues Brian Nosek and Jesse Graham and I created a survey and posted it on the web at www.YourMorals.org.

30,000 people have responded to the survey so far. You can answer too.

Here are the results from about 23,000 Americans.

On the left is the liberal score. Conservative on the right. Moderate in the middle.

The blue line shows people's responses to the average of all harm questions.

As you can see, people care about harm and care issues.

They strongly support this kind of statement across the board, but as you can see liberals care a little more about this than conservatives. The line is slanted downward.

The same is true when it comes to fairness.

But look at the remaining three lines.

For liberals, the scores are very low.

They are basically saying, "This is not moral."

In-group, authority, purity, this has nothing to do with morality. i refuse it ”

But as people become more conservative, their values ​​grow.

Liberals can be said to have a two-channel or two-base morality.

Conservatives have a morality that approximates five foundations, or five channels.

We see this in every country we examine.

This is data for 1,100 Canadians. Flip through some other slides.

UK, Australia, New Zealand, Western Europe, Eastern Europe, Latin America, Middle East, East Asia, South Asia.

Also note that all of these graphs have steeper slopes depending on within-group, authority, and purity. This shows that disagreements in any country are not about harm or equity.

So while we debate what is fair, we all agree that harm and fairness matter.

Moral debates within cultures are particularly concerned with issues of intra-group, authority, and purity.

This effect is so powerful that no matter how you ask it, you will see it.

In a recent study, we asked people, assuming they were about to get a dog, they chose a particular breed and learned about it.

Suppose that this particular breed learns to be independent, friendly and equal to its owner.

A liberal would say, "That's great!"

Because liberals like to say, "Get it! Go ahead."

(Laughter.) But for those of you who are conservative, it's not that appealing.

Loyalty is good for conservatives if you are conservative and find out that your dog is very loyal to your home and family and won't get attached to strangers. A dog must be loyal.

But to liberals, it sounds like this dog is running for the Republican nomination.

(Laughter) You might say, there is a difference between liberals and conservatives, but what makes the other three foundations moral?

Aren't they the basis of xenophobia, authoritarianism and Puritanism?

What makes them moral?

The answer, I believe, is contained in this wonderful trilogy by Hieronymus Bosch, The Garden of Earthly Delights.

Everything is in order, everything is beautiful, all people and animals are doing what they are supposed to do and where they are supposed to be.

But things change when you think about the way the world is.

We allow everyone to do whatever he wants with all the abilities of every human being and every animal.

Some may recognize this as the 60's.

(Laughter) But the 60's will inevitably give way to the 70's, and cutting the aperture will be a little more painful.

Of course Bosch called this hell.

Thus, this triptych, these three panels, depict the timeless truth that order tends to collapse.

The truth of social entropy.

But don't think that this is just a part of the Christian imagination that Christians are happy to take on this strange problem, but here is the same story, the same developments told in an article published in Nature a few years ago. In it Ernst Fehl and Simon Gachter let people play the commons' dilemma. It's a game that gives people money so that each round of the game they put money into a common pot and the experimenter doubles the money there and then it comes true. It's all split between players.

So this is a lot like any kind of environmental problem that demands sacrifices from people, but doesn't really benefit from their own sacrifices.

Everyone is tempted to take a free ride when they really want others to make sacrifices.

What happens is that people start out moderately cooperative.

All this is played anonymously.

In the first round, people donate about half of their possible amount.

But they quickly discover that others aren't doing all that much.

"I don't want to be a dupe. I won't cooperate."

As such, cooperation rapidly declines from fairly good to almost zero.

But then here's a trick. Fehr and Gechter told the people in the seventh round. "Did you know? New rules.

If you want to donate some of your own money to punish people who don't contribute, you can do it. ”

And as soon as people knew that the issue of punishment was going on, cooperation skyrocketed.

It soars and continues to rise.

Numerous studies have shown that it can be very helpful in solving cooperative problems.

Appealing to people's goodwill is not enough.

Any kind of punishment would help.

Even if it's just shame, embarrassment, or gossip, it takes some kind of punishment to get people to cooperate when they're in a large group.

Recent research suggests that religion—that is, evoking God and making people think about God—in some cases, often leads to more cooperative, more pro-social behavior.

Some believe that religions are adaptations evolved by both cultural and biological evolution to unite groups, with the goal of trusting each other and competing more effectively with other groups.

It's a controversial issue, but you're probably right.

But I am particularly interested in religion and its origins, and what religion does to us. Because I think the greatest wonder in the world is not the Grand Canyon.

The Grand Canyon is really simple. A lot of rocks, a lot of water and wind, and a lot of time make up the Grand Canyon.

It's not that complicated.

This is where things get complicated. People lived in places like the Grand Canyon, cooperating with each other, or on the savannahs of Africa and the frozen shores of Alaska.

Some of these villages grew into mighty cities such as Babylon, Rome, and Tenochtitlan.

How did that happen?

This is truly a miracle, much more difficult to explain than the Grand Canyon.

I think the answer is that they used every tool in their toolbox.

It took all of our moral psychology to create such a supportive group.

Yes, we need to worry about harm, we need a sense of justice.

But if there are subgroups, and if those subgroups have some kind of internal structure, an ideology that directs people to curb their carnal desires and pursue higher and higher ends, then it helps to organize them.

Here we get to the heart of the disagreement between liberals and conservatives. Liberals reject three of these foundations.

They say, “Let’s celebrate diversity, not common intra-group membership,” “Let’s question authority,” and “Keep your laws out of my body.”

Liberals have very noble motives for doing this.

Traditional authority and morality can be very oppressive and restrictive for the lowest class, women and misfits.

Liberals speak for the weak and the oppressed.

They want change and justice, even at the risk of chaos.

This shirt reads, "Stop Bitching, Start the Revolution."

Revolution is good if there is a high tolerance for experience. It's a change, it's fun.

Conservatives, on the other hand, speak for institutions and traditions.

They want to bring order to the bottom of the population, even at some cost.

Conservative insight is good in that order is very difficult to achieve.

It's precious and really easy to lose.

Thus, as Edmund Burke said, "The bondage of men should be considered as part of their rights as their freedom."

It was after the turmoil of the French Revolution.

If we can see that both liberals and conservatives have something to contribute, and balance change and stability, I think it will pave the way for us to move out of the moral matrix.

This is the great insight achieved by all Asian religions.

Think about yin and yang.

Yin and Yang are not enemies. they don't hate each other.

Yin and Yang, like day and night, both are necessary for the world to function.

We see the same thing in Hinduism.

There are many high gods in Hinduism.

Two of them are Lord Vishnu, the Preserver, and Lord Shiva, the Destroyer.

The statues are actually two gods sharing the same body.

Since there is a Vishnu mark on the left side, we can assume that Vishnu is a conservative deity.

On the right side is Shiva's mark. Shiva is a liberal god.

and they work together.

I think these two verses contain the deepest insight I've ever had on moral psychology.

From Zen Master Seisho: "Never say 'for' or 'against' if you want the truth to be plain before you. The conflict between "for" and "against" is the worst disease of the mind. ”

Unfortunately, the disease also afflicts many of the world's leaders.

But before you feel superior to George Bush, before you throw stones at him, ask yourself. "Do you accept this?"

Will you accept to withdraw from the battle between good and evil?

Are you for or against something?

So what do you mean? what should you do

Well, if you take the greatest insights from ancient Asian philosophies and religions and combine them with the latest research on moral psychology, I think you come to the conclusion that our righteous minds were designed by evolution to unite us into teams, divide us against other teams, and blind us from the truth.

So what do you do?

Am I telling you to embrace Sēngcàn and stop fighting for and against?

No, absolutely not. I didn't say that.

This is an amazing group of people doing a lot, using a lot of their talents, talents, energies and money to make the world a better place, fight injustice and solve problems.

But as we learned in Samantha Power's story about Sergio Vieira de Melo, you can't just poke around saying, "You're wrong, I'm right." Because, as you just heard, everyone thinks they are right.

Many of the problems we have to solve are problems that require other people to change.

And if you want to change other people, the better way is to first understand who you are, understand your moral psychology, understand what everyone thinks you are right, and then step out, even if only for a moment, and talk to Sankan.

Try to get out of the moral matrix and see it as a struggle that everyone believes they are right. And everyone has reasons for their actions, even if you disagree with them.

Step on.

And if you do it, it is an essential act to cultivate moral humility and to break out of this self-righteousness that is the normal human condition.

Consider the enormous moral authority of the Dalai Lama.

It comes from his moral humility.

So I think the point of my talk, and the point of TED, is that this is a group that is passionate about pursuing changing the world for the better.

The people here are passionate about making the world a better place.

But there is also a passionate commitment to truth.

So I think the answer is to use that passionate commitment to truth to try to change the future for the better for all of us.

thank you.

(applause)

Before I get to the point, I would like to tell you two things about myself.

First, as a book author and magazine columnist, I have been writing about manners and decency for over 20 years.

Second, I know my friends are very cautious about inviting me to dinner because any missteps at the table will likely be on paper.

(Laughter) So I'm looking, I can see behind there, and I can see through the portal as well.

(laughs) Speaking of dinner parties, I would like to talk about the dinner party I attended in 2015.

To put this in context, it was the time when Caitlyn Jenner came out for the first time, shed her Kardashian identity, and started life as a trans activist.

At the time, I wrote a column for People magazine, talking about the importance of names and how they are our identity.

And to abuse them or not to use them erases us in a way.

With Caitlyn Jenner in particular, we talked not only about Caitlyn, but her pronoun usage.

her pronoun.

So I'm at this dinner - delicious, wonderful, fun - while my host rants about Caitlyn Jenner.

And she claims it's disrespectful to force Caitlyn Jenner to use a new name or new pronouns.

She doesn't stand by it, and I'm listening, and I'm meditating, so I took a sacred pause before responding.

(Laughter.) And I reminded her that her name changed when she got married and became her husband's name.

And that's the name we all use now.

Don't use it just because it's her legal name, use it to show respect.

So does Miss Jenner.

She didn't buy it, so we didn't speak for years.

(laughs) So...

I am known as a civilist.

And I think it's probably a word that you're not very familiar with.

It's not a generic term, it's derived from Latin and French and means an individual who strives to live by a moral code and to be a good citizen.

The word "politeness" is derived from it, and the original definition of politeness is a citizen willing to give himself up for the good of the city, the good of the Commonwealth, or the greater good.

So in this talk, you'll learn three new ways to be polite. I hope it lives up to the original definition of politeness.

My first problem is that the word politeness is outdated.

My second problem is that politeness has become a dirty word in this country.

And it's either leaning right or leaning left.

And that's partly because modern usage equates politeness with courtesy, formal politeness, and formal behavior.

We are moving away from the idea of ​​citizenship.

So, first, let me say a few words about my friends on the right who confuse politeness with so-called political correctness.

And to them, the call for politeness is very similar to what George Orwell wrote in "1984," which he called "Newspeak."

And this was an attempt to change the way we speak by forcing us to change the language we use.

Change the way you think by changing the meaning of words.

And I think my dinner host may have been rattling around there, too.

But the first time I personally understood the issue of right-wing civility was when I wrote a column about then-candidate Donald Trump.

And he just said he doesn't have time to practice full political correctness and he doesn't believe the state does it.

And I took that to heart, it was very -- as you can imagine, the audience was very enthusiastic about it online.

There were 1,000 responses, but this one caught my eye because it was representative. “Political correctness is a pathological system in which liberals dominate the conversation, labeling, demonizing and vilifying dissidents.”

Therefore, in the right opinion, I believe that politeness leads to reproach.

That's right.

Well, my friends on the left have a problem with that too.

And others, for example, have harassed Trump administration officials who support the president's border wall.

They've been called rude, they've been called mean, and they've been called worse.

And after a similar incident last year, even the Washington Post—you know, the left-leaning Washington Post—edited and sided with civility.

And they argued that officials should be allowed to eat in peace.

Hmm.

"You know, the real rudeness here is the wall.

Teargassing of children, separation of families. ”

Protesters say so.

And imagine if we've been polite and courteous throughout history in this country.

You know, I'm thinking about women's suffrage.

They marched and pickedeted.

They were accused and arrested in the 1920s of promoting voting for women.

As you know, I am also thinking of Reverend Martin Luther King Jr., the father of non-violent civil disobedience in America.

He was labeled disrespectful for trying to promote racial and economic justice.

I hope you can see why politeness is an issue and a foul language here.

Now, does this mean that we cannot disagree, speak our minds?

Absolutely not.

I recently spoke with Dr. Carolyn Lukensmeyer.

She is something of a civility guru in this country and is the executive director of an organization called the National Institute of Civil Discourse.

And she told me, "Courtesy does not mean soothing or avoiding important differences.

It means listening and talking about those differences with respect. ”

In a healthy democracy, it should.

And I call it respectful engagement.

But even civil debate needs rules, and it needs boundaries.

For example, there is a difference between words that are simply rude or demeaning and words that evoke hatred or intolerance.

And especially about groups.

And I'm thinking about race and ethnicity, the LGBTQ community, and people with disabilities.

We at Snowflake call this speech "hate speech".

And hate speech can lead to violence.

So, in the fall of 2018, I wrote a column about Dr. Christine Blasey Ford.

As you may remember, she was one of the women who accused Supreme Court nominee Brett Kavanaugh of sexual assault.

And in reply I received a personal message on this slide.

Heavily edited.

(Laughter) This message was 50 words long. 10 of them were f-bombs.

And the Democrats were slammed, and President Obama was slammed, and I was called rather vulgar and crude.

That message contained obvious threats, which is why the Post's editors sent it to the authorities.

This happened just before the pipe bomb was sent to other media, so everyone there was on high alert.

And the bigger picture was the murder of five staff members at a Maryland newspaper just a few months earlier.

They were shot dead by a grudge reader.

"Shut up, or else."

And around the same time, another reader of mine started stalking me online.

And at first...

Would you say it's light and fluffy?

Around this time last year, I was still wearing my Christmas decorations, and he texted me, "You should take your Christmas decorations off."

Then one day he noticed my dog ​​was off the leash and commented that I had gone to the market.

And he wrote me a letter saying, "If someone shoots you, it won't be a loss at all."

I wish that was the end of the story.

Because then a few months later, in a rage, he came to my front door, my door, and tried to break it down.

I now own a mace, a security system, and a Louisville Slugger baseball bat.

(sighs) "Shut up."

So what can you do to prevent politeness from turning ugly and violent?

My first rule is to defuse verbal escalation.

And I stopped using trigger words in print.

Trigger words are "homophobic", "racist", "xenophobic" and "sexist".

all those words.

they push people away.

They are inflammatory and do not allow us to find common ground.

And to this day, when John McCain died in 2018, his supporters pointed out that he never made a personal attack.

But his opponents agreed as well, and I thought that was really remarkable.

He challenged people's policies and positions, but never took it personally.

This is the second rule.

So the issue of decency is not just an American issue.

Calls for civility attacks are now being raised in the Netherlands, and the country is under the spell of, as one Dutch philosopher put it, 'bakhtering'.

Well, this wasn't a word I knew before, so I looked it up quite a bit.

This refers loosely to bullying and loss of manners.

It actually means a lot worse than that, but that's what I mean here.

But if there are specific words to describe such problems, you know you are really in trouble.

And in the UK, the [2016] Brexit vote...

It has further divided the country.

And critics of the dissolution called those who supported it - I love that term - "Britain's frightened parochial lizard brain."

The brains of British frightened, narrow-minded lizards.

It's personal.

And I miss the antiquity of "Downton Abbey" and its politeness.

But there is a third rule. Do not confuse courtesy with politeness.

Even if there was a wonderful countess like Mrs. Maggie Smith.

(laughter) [Don't be a defeatist. Very middle class. ] So let's wrap up with one last story.

Not long ago, I went to a bakery and they made wonderful scones.

So, there are long lines and lots of scones.

Then one by one the scones disappeared and finally there was a woman between me and the last scone.

(Laughter.) Praise the Lord, she said, "eat a croissant."

(Laughter) So when it was my turn, I said, "I'd like that scone."

The man behind me, who had never turned around or looked, yelled, "That's my scone!"

I've been waiting in line for about 20 minutes. ”

And I thought, 'Who are you?

I've been in line for about 20 minutes and you're behind me. ”

So, I grew up here in New York and went to high school not far from here.

And you know, I may look very polite here and all, but anyone can hail a taxi in this room or on this street.

So when I told him, he was surprised...

"Shall we cut it in half?"

"Shall we cut it in half?"

I didn't think about it, it just came out.

Then he was very perplexed, and I saw his face change, and he said to me, "Well, why don't we buy another pastry and share both?"

And he did, and so did we.

And we sat and talked.

We had nothing in common.

(Laughs) We had nothing in common: nationality, sexual orientation, occupation.

But through this moment of kindness, this moment of connection, we have developed a friendship and kept in touch.

(Laughter) Later he was appalled to find out that I was called a civilist.

(Laughter) But I call this the joy of politeness.

And it got me thinking, when we choose to be disrespectful, what are the good things we give up as well as the problems we can avoid?

And good means friendship, connection.

That means sharing 1000 calories.

But I also want to say it in a broader sense.

As a community, as a country, and as a world.

what are we missing?

So today we are embroiled in a massive civil war over ideas and identities.

And we have no rules for them.

As you know, war has rules.

Consider the Geneva Conventions.

They ensure that all soldiers are treated humanely, both on and off the battlefield.

So, frankly, I think we need a Geneva Convention on Courtesy and lay down the rules of discourse on that parameter.

To help us become better citizens of our communities and countries.

And if I have anything to say about it, I base those rules on the original definition of politeness, which comes from Latin and French.

Politeness: A nation willing to dedicate themselves to the greater good.

for the benefit of the city.

So once you understand that, I don't think politeness is a dirty word.

And I hope that civilianists never become obsolete, or obsolete.

thank you.

(applause)

(Applause) David Gallo: Bill Lange. I'm Dave Gallo.

Here's a video telling some stories about the ocean.

There are some of the most amazing Titanic videos I've ever seen, and I'm not going to show you some of them.

(Laughter) The truth of the matter is that Titanic is not the most exciting sea tale, even though it breaks all sorts of box office records.

And I think the problem is that we take the ocean for granted.

If you think about it, 75 percent of the earth is ocean.

Most of the earth is seawater.

Average depth is about 2 miles.

Part of the problem, I think, is that we're standing on the beach, or looking at images of the ocean like this, and you're looking at this big, big blue space, and it's sparkling, it's moving, it's got waves, it's got waves, it's tidal, and you have no idea what's there.

And the ocean has the longest mountain range on earth.

Most animals live in the sea.

Most earthquakes and volcanoes occur in the ocean or on the seabed.

Marine biodiversity and biodensity are higher than rainforests in some places.

Although it is almost undeveloped land, there are beautiful scenery like this that fascinates us and makes us familiar with it.

But when you're standing on the beach, I want you to think that you're standing on the edge of a completely unfamiliar world.

Venturing into the unknown requires very specific skills.

We use the submarine Alvin, we use cameras. The camera was developed by Bill Lange in cooperation with Sony.

Marcel Proust said, "The true voyage of discovery consists not in seeking new landscapes, but in having new eyes."

The people we partnered with have given us new eyes not only on what exists: new landscapes on the bottom of the ocean, but also on how we think about life on Earth itself.

Here is the jelly.

It's one of my favorites because it has all sorts of functional parts.

It turns out that this is the longest living creature in the sea.

It can grow up to about 150 feet in length.

But do you see these different behaviors?

I love that kind of thing.

The bottom has these fishing lures. going up and down.

Tentacles are hanging and spinning round and round.

Colonial animals.

These are all individual animals united to form this one creature.

And there's a ready-to-use jet thruster up front that glows a little.

Put all the big fish, schooling fish, etc. on one side of the scale and the jellied animals on the other side and they will definitely win.

Most of the biomass in the ocean is made from these creatures.

This is X Wing Death Jelly.

(Laughter) Bioluminescence -- They use light to attract mates, attract prey, and communicate.

I couldn't show you what I archived from Jelly.

They come in different sizes and shapes.

Bill Lange: We tend to forget the fact that the ocean is miles deep on average, and we know a lot about the animals in the first 200 or 300 feet, but we don't know much about what's there all the way down to the bottom.

And these are the kinds of animals that live in a three-dimensional space that we haven't really explored: microgravity.

We often hear about giant squid and the like, some of these animals reaching about 140, 160 feet in length.

they are poorly understood.

DG: This is one of them, another one of our favourites. Because it's a small octopus leg.

You can actually see through his head.

And here he is, flapping his ears, so gracefully up.

We see all depths, even the deepest.

They range from a few inches to a few feet.

They come very close to the submarine and look out the window to see inside it.

This is just a world within a world. I'm going to show you two.

In this case we are passing through the Central Ocean and we see creatures like this.

It's like a chicken in the sea.

This guy looks incredibly formal in some ways.

Then one of my favourites. What a face!

This is basically the scientific data you are looking at.

This is footage collected for scientific purposes.

And that's one of the things Bill is doing, giving scientists a first-of-its-kind view of these animals in the world they belong to.

They don't catch with nets.

In fact, they look down on them in that world.

We pick up the joystick, sit in front of our computer on Earth, push the joystick forward, and fly around the globe.

We look at the Mid-Ocean Ridge, a 40,000-mile-long mountain range.

The average depth at the summit is about a mile and a half.

And we're over the Atlantic -- that's the ridge there -- but we're crossing the Caribbean, Central America, and hitting the Pacific Ocean at 9 degrees north latitude.

This is one of the mountains that we map using sound and sonar.

Coming around the cliff on the right here.

The heights of these mountains on either side of this valley are almost always higher than the Alps.

And there are still tens of thousands of unmapped mountains out there.

This is a volcanic ridge.

The scale is getting smaller and smaller.

And finally you can come up with something like this.

This is our robot, Jason's icon.

And you can sit in a room like this, with a joystick and a headset, and move such a robot around the ocean floor in real time.

One of the things we're trying to do with our partners at Woods Hole is bring this virtual world, this world, this unexplored territory back to the lab.

Because we are seeing it in fragments now.

We see it as sound, we see it as video, we see it as pictures, we see it as chemical sensors, but we have yet to put it all together in one interesting image.

This is where Bill's camera really shines.

This is what is called a hydrothermal vent.

Here we see clouds of dense, hydrogen sulfide-rich water emerging from an undersea volcanic axis.

Up to 600, 700 degrees F, reach anywhere in that range.

So this is all water under the sea, a mile and a half, two miles, three miles down.

And we knew in the 60's and 70's that it was a volcano.

And we got a hint that these things exist along that axis. Because with volcanism, water comes down from the ocean into fissures in the ocean floor, contacts magma, and erupts hot.

We did not know that sulfides and hydrogen sulfides were so abundant.

We had no idea about these things we called chimneys.

This is one of the hydrothermal vents.

600 degree Fahrenheit water springing from the earth.

With mountains higher than the Alps on either side, the environment here is very dramatic.

BL: The white substance is a type of bacteria that grows at 180°C.

DG: I think this is one of the greatest stories we're seeing from the bottom of the ocean right now. Bacteria are the first material to emerge from the ocean floor after a volcanic eruption.

And we began to wonder for a long time, how did everything end up there?

What we do know is that it probably comes from inside the Earth.

Not only does it come out of the earth, that is, the biogenesis that arises from volcanic activity, but bacteria support these colonies of life.

The pressure here is 4,000 pounds per square inch.

1.5 to 2 to 3 miles above the surface, the sun never sets here.

All the energy that sustains these life forms comes from within the Earth: chemosynthesis.

And you can see how dense the population is.

These are called tubeworms.

BL: This worm has no digestive organs. they don't have mouths.

However, there are two types of gill structure.

One is for extracting oxygen from deep seawater, and the other houses this chemosynthetic bacterium, which takes in hydrothermal fluid (the hot water you see coming out of the bottom) and converts it into simple sugars that tubeworms can digest.

DG: As you can see, there are crabs living underneath.

He managed to grab the tip of this bug.

Now it usually retracts as soon as you touch a crab.

oh! good mood.

So as soon as a crab touches a crab, it retracts into its shell in the same way it does with its claws.

There's a whole story unfolding here, and we're just starting to get some idea now, thanks to this new camera tech.

BL: These bugs live in real temperature extremes.

Their feet have a temperature of about 200°C and their heads about 3°C. It's like having your hands in boiling water and your feet in freezing water.

That's how they want to live.

(laughter) DG: This is the female of this species.

And these are men.

please look. It doesn't take long for the two men here—this man and the man who's about to appear—to start fighting.

Everything you see unfolds in the pitch black deep sea.

There are no lights there except the ones we brought with us.

Come on, let's go.

In my last series of dives, I counted 200 species in these areas. Of these, 198 were new species.

BL: One of the big problems is that these animals are quite difficult to collect for biologists working in these fields.

And because they collapse on the way up, the images are very important to science.

DG: Two octopuses about two miles deep.

This pressure is truly amazing. That these animals could exist there with enough pressure to crush the Titanic like a Pepsi can.

The ones we have seen so far have been in the Pacific Ocean.

This is from the Atlantic Ocean. Added more depth.

Here we see this shrimp harassing this poor little man, and he knocks it off with his claws. very!

(laughs) And the same thing is happening here.

What they're aiming for is that the food on this crab's back is a very strange bacterium that lives on the backs of all these animals.

And what these shrimp are trying to do is actually pick up bacteria from the backs of these animals.

And crabs don't like it at all.

These long filaments found on the crab's back are actually made by the product of that bacteria.

So the bacteria make the crab hairy.

You can see this again on the back side.

The red dot is the submarine Alvin's laser light that lets you know how far you are from the vent.

They are all shrimp.

You can see hot water coming out here and here and here.

They cling to the rock face and actually scrape the bacteria off the rock face.

This is a tiny little vent coming out of the side of the pillar.

Those pillars will be several storeys high.

Here you will find this incredibly exotic landscape of pillars, hot springs, volcanic eruptions, earthquakes, and more, inhabited by some very strange animals that live solely on chemical energy from the ground.

They don't need the sun at all.

BL: Can you see the white V marks on the back of the shrimp?

In fact, it is an organ that senses light.

That's how you find hydrothermal vents.

Because vents emit blackbody radiation (characteristic of IR), you can find these vents even at great distances.

DG: All of this is happening along what we call the Ribbon of Life, a 40,000-mile mountain range. Because even today, when we speak, life is being generated there by volcanic activity.

It's the first time I've tried this anywhere.

I'm going to show you high quality images from the Pacific Ocean.

We are moving up one of these pillars.

It is several stories high.

There you will find a variety of animal habitats.

There's an interesting kind of hot plate here, with aerated water coming out of it.

These are all individual homes for worms.

Let's take a closer look at that community here.

Crabs here, worms here.

Little animals are crawling around.

Here is the tower structure.

I think this looks the cleanest.

I just can't stand the fact that this little chimney sits here and continues to smoke.

By the way, this is ferociously toxic.

We never got a permit to dump this into the ocean, and it all comes out of the ocean.

(Laughter) It's unbelievable. It's basically sulfuric acid, and it's being disposed of at an incredible rate.

And the animals thrive - and we probably came from here.

Perhaps we evolved from there.

BL: This bacterium we've been talking about turned out to be the simplest form of life ever discovered.

There are numerous groups that claim life evolved in these vents.

Fumarole sites are ephemeral, and while individual sites may only last about 10 years, they remain ecologically stable for millions or even billions of years.

DG: It works too well. You can see there are fish here too.

A fish is sitting here.

Here is a crab clawing at the tip of a tube worm, waiting for the worm to stick its head out.

(Laughter) BL: Biologists currently cannot explain why these animals are so active.

Insects grow centimeters per week!

DG: As I said, this site is incredibly toxic from a human perspective.

Not only that, but its lifeline, the plumbing system, goes down about every year.

The plumbing system has stopped and the site must be relocated.

An earthquake occurs once every five years, followed by a volcanic eruption that completely wipes out the area.

Nevertheless, these animals grow within about a year.

You are talking about higher biodensity and biodiversity than a freshly revived rainforest.

sensitive? yes.

Is it fragile? No, it's actually not that fragile.

One last thing.

The sea, salt water, sediments and rocks on the seafloor tell a story.

It's unbelievable.

When we look back in time, what we see in those sediments and rocks is a record of Earth's history.

Everything on this planet works through cycles and rhythms.

Continents are moving away. they get back together.

The sea comes and goes. Mountains come and go. Glaciers come and go.

El Nino comes and goes. It's not a disaster, it's rhythmic.

What we are learning now is like a symphony.

It's just like music, it's really like music.

And what we're learning now is that you can't listen to a symphony that spans five billion years and still say, "Stop! I want tomorrow to sound the same as today."

It's absurd. It's totally unreasonable.

So what we have to learn now is to find out where this planet is going on different scales and work on that.

Learn how to manage it.

The concept of saving is meaningless.

Conservation is even more difficult, but you can probably get there.

thank you very much.

thank you.

(applause)

Throughout the 1960s, the FBI collected nearly 2,000 documents in its investigation of one of America's most prominent figures.

The subject of this investigation was a writer named James Baldwin.

At the time, the FBI was investigating many artists and thinkers, and most of their files were a fraction of the size of Baldwin's.

During the years he was being pursued by the FBI, he became one of the best-selling black authors in the world.

So why has James Baldwin become such a big figure in the imagination of both the public and the authorities?

He was born in Harlem in 1924, the eldest of nine children.

At age 14, he began working as a preacher.

His preaching gave him a voice as a writer, but he also became conflicted about the church's position on racial inequality and homosexuality.

After graduating from high school, he started writing novels and essays while doing odd jobs.

But the problems that kept him away from the church were still inevitable in everyday life.

Constantly faced with racism and homophobia, I felt angry and disillusioned and longed for a life with fewer restrictions.

So in 1948, at the age of 24, he moved to Paris as a writing fellow.

Originally from France, in 1953 he published his first novel, "Let's go to tell the story on the mountain".

Set in Harlem, the book explores the church as a source of both oppression and hope.

It was popular with both black and white readers.

Baldwin, acclaimed for his novels, summarized his thoughts on race, class, culture, and exile in a long 1955 essay, Notes of a Native Son.

Meanwhile, the civil rights movement was gaining momentum in America.

Black Americans were making gradual gains in voter registration and voting, but they were still denied basic dignity in schools, buses, the workforce, and the military.

Though Baldwin spent the rest of his life primarily in France, he was deeply committed to the movement and keenly aware of the unfulfilled promises of his homeland.

He has seen family, friends and neighbors descend into addiction, imprisonment and suicide.

He believed their fate stemmed from the constraints of a segregated society.

In 1963, he published The Fire Next Time, a shocking portrait of racial conflict that held white America accountable, but went even further by arguing that racism hurts white people too.

In his view, everyone was closely intertwined into the same social fabric.

For a long time he believed that "people are trapped in history, and history is trapped in them." Baldwin's role in the civil rights movement went beyond observation and reporting.

He also traveled to the American South to attend meetings where he gave his talks.

He debated both white politicians and black activists, including Malcolm X, and acted as a liaison between black activists and intellectuals and white establishment leaders like Robert Kennedy.

Because of Baldwin's unique ability to articulate the causes of social turmoil in a way that white audiences wanted to hear, Kennedy and others tended to see him as an ambassador for black Americans, but Baldwin rejected that label.

At the same time, his eloquence made him a threat to the FBI.

Even in the civil rights movement, Baldwin felt like an outsider at times due to his choice to live abroad and his open exploration of his sexuality in his writings during a homophobic era.

Throughout his life, Baldwin saw his role as witnessing.

Unlike many of his peers, he lived to witness some of the civil rights victories, but continued racial inequality in the United States weighed heavily on him.

He may have felt trapped in his own moment in history, but his words made generations feel known, while also guiding them to a more nuanced understanding of society's most complex issues.

So, not long ago, my family underwent 3 minor surgeries, each taking about 30 minutes, and I received 3 bills.

The first time, the anesthesia alone cost $2,000. The second is $2,000. The third is $6,000.

That's why I am a journalist. what happened to that?

In fact, it turned out that they were charging $1,419 for a generic anti-nausea drug that you can buy online for $2.49.

I had long and unsatisfying arguments with hospitals, insurance companies and employers.

We all agreed that this was perfectly fine.

But it got me thinking, and the more people I talked to, the more I realized that no one knew how much medical care would cost.

I don't know how much it will cost before, during and after procedures and inspections.

Only a few months later, I receive a "benefits description" that explains absolutely nothing.

So this thing came back to me after a while.

I volunteered to buy The New York Times, where I worked as a journalist for over 20 years.

I was looking for my next performance.

It turns out that the next move is to create a company to tell people how much medical care costs.

I won a "Shark Tank" type pitch contest to do just that.

Health care accounted for almost 18% of the gross domestic product last year, but no one knows what it will cost.

But what if we knew?

So we started small.

We called doctors and hospitals and asked how much we could get in cash for a simple procedure.

Some people helped me.

Many hung up.

Some were simply rude.

Even though we had a lot of information, they said 'we don't know' or 'our lawyers can't tell us that'.

For example, here in the New York area, I found an echocardiogram for $200 in Brooklyn and $2,150 in Manhattan just a few miles away.

New Orleans, same simple blood test, $19 here, $522 just a few blocks away.

San Francisco, same MRI, just 40 miles away for $475 or $6,221.

These price fluctuations were present for all procedures and all cities examined.

Then we started asking people to tell us their health insurance premiums.

In partnership with WNYC, a public radio station here in New York, we asked women how much they charge for mammograms.

People said it was too personal no one would do that.

But in three weeks, 400 women told me about their prices.

It then started making it easier for people to share their data into an online searchable database.

It's like Kayak.com combined with transportation app Waze for healthcare.

(Laughter) We call it a community-created healthcare cost guide.

Our research and crowdsourcing work has led to partnerships with top news outlets across the country, including New Orleans, Philadelphia, San Francisco, Los Angeles and Miami.

We used data to tell the stories of people in distress and how to avoid that suffering – avoiding “pesky” bills.

A woman in New Orleans saved nearly $4,000 using our data.

Donors in San Francisco saved nearly $1,300 by putting away their insurance cards and paying in cash.

There are many people who receive out-of-network bills while attending in-network hospitals.

And some hospitals continued to bill the deceased man.

It turns out that thousands of people want to know the price.

They want us to know how much things cost, know how to discuss bills, and help solve this problem that hurts them and their friends and family.

We have spoken to people who have had to sell their cars to pay for medical bills, who have gone bankrupt, and who have stopped treatment because of the cost.

Imagine being able to get a diagnosis but not a treatment.

We started a big debate about the cost of doctors and hospitals, of course their patients, or as we like to call them people.

(Laughter) We changed our policy.

The Louisiana legislature passed a consumer protection bill that had been dormant for 10 years after we launched it.

Let's be honest, this massive and slow-growing public health crisis is a national emergency.

And I doubt the government will help us anytime soon.

But what if the answer was really simple? Always publish all prices.

Will our individual bills be cheaper? our health insurance premiums?

Let me be very clear about this, this is a US problem.

In most other parts of the developed world, sick people don't have to worry about money.

It is also true that price transparency does not solve all problems.

High medical costs and major friction with the insurance system will continue.

There will continue to be massive problems of cheating, over-treatment and over-diagnosis.

And not all can be shopped.

Not everyone wants the cheapest appendectomy or the cheapest cancer treatment.

But when we talk about these apparent effects, we are really looking at a very simple real problem.

When we first started asking for a price, we actually felt like we were going to get busted.

It seemed like some sort of transgression to equate medicine with health care, but what set me free was the discovery that there were not only data but also good, honest people in the system who wanted to help people get the care they needed at affordable prices.

And it's easier to ask questions.

So I would like to ask you some questions.

What if everyone knew in advance how much medical care would cost?

What if every time you Googled for an MRI, you got a dropdown just like when you Googled for a laser printer, showing where and how much you can buy one?

What happens when all the time, energy and money spent hiding prices is squeezed out of the system?

What if each of us could choose a $19 test instead of a $522 test each time?

Will our individual bills be cheaper?

What is our premium?

I don't know, but if you don't ask, you'll never know.

And you may save a lot of money.

And I can't help but think that many of us and the system itself would be healthier.

thank you.

(applause)

So the big question that we face now, and have been facing for many years, is whether we are at risk of a nuclear attack.

Now, there's probably a bigger issue that's actually more important than that. It is the concept of permanently excluding the possibility of a nuclear attack and completely eliminating the threat.

And I want to assert to you that in the years since we first developed nuclear weapons, up to this moment, we have indeed lived in a dangerous nuclear world characterized by two phases. From now on, we will experience it together.

First of all, we started the nuclear age in 1945.

The United States had developed several nuclear weapons through the Manhattan Project, and the idea was quite simple. Harness the power of the atom to end the atrocities and horrors of this endless World War II that the United States has been involved in in Europe and the Pacific.

And in 1945, our country was the only nuclear power.

We dropped several nuclear weapons on Japan, including two of them on Hiroshima in August 1945 and on Nagasaki a few days later, killing about 250,000 people between the two.

And for several years, our country was the only nuclear power on earth.

By 1949, however, the Soviet Union decided that making our country the sole nuclear power was unacceptable, and began countering what the United States had developed.

And the years 1949-1985 were an extraordinary period of nuclear build-up that no one could have imagined in the 1940s.

So by 1985, each of the red bombs here was equivalent to thousands of nuclear warheads. There were 65,000 nuclear warheads in the world and seven members of what became known as the "Nuclear Club".

And it was an extraordinary time. We are going to experience some of the spirituality that Americans and other people of the world have been experiencing.

But I would like to point out to you that 95 percent of nuclear weapons at any given time since 1985, and of course still will be, were part of the arsenals of the United States and the Soviet Union.

After 1985, before the collapse of the Soviet Union, we started working in terms of nuclear disarmament.

We have started counter-proliferation and reduced the number of nuclear warheads worldwide to about 21,000 total.

This is a very difficult number to work with. Because what we did was "decommission" some warheads without citations.

You can probably still use it. They may be "recommissioned", but by very complicated counting, I believe we have about a third of the nuclear arsenals we had before.

But we also added two more members to the nuclear club during that period: Pakistan and North Korea.

So while we still have nuclear weapons in full force today in many countries around the world, the situation is very different.

Therefore, I will discuss the nuclear threat in two chapters.

Chapter 1 covers the collapse of the Soviet Union from 1949 to 1991, and from that point through the years we were dealing with the nuclear arms race of the superpowers.

It was characterized by a very fragile state-to-state conflict.

And basically, we've lived, and some might argue, still live all those years on the brink of a literally apocalyptic global disaster.

It's incredible that we actually went through it all.

We were totally dependent on this wonderful acronym at the time, MAD.

It stands for Mutually Assured Destruction.

This means that if you attack us, we will attack you virtually at the same time, and the end result will be the destruction of your country and mine.

In other words, I could not nuke you because of the threat of my own destruction. That was our way of life.

And the danger, of course, is that a misread on the radar screen could actually trigger a counterattack, even if the first country wasn't actually firing anything.

During this first chapter, a high level of public awareness of the potential for nuclear catastrophe was heightened and, in fact, an indelible image was planted in our collective minds that a nuclear holocaust would be absolutely global and devastating and could, in some ways, mean the end of civilization as we know it.

So this was the first chapter.

Now, the strange thing is that we knew that such an extinction of civilization would occur, yet we engaged the United States, and indeed the Soviet Union, in a series of response plans.

It was truly incredible.

So, premise one is that we destroy the world. And premise 2 is why not prepare for it.

So what we offered was a collection of different things. I'll take a quick look at a few things to evoke memories.

For those born after 1950, consider this just entertainment. Otherwise, it stays in memory.

It was Burt the Turtle. (Video) This was basically an attempt to teach my students that if we were to be involved in a nuclear clash or a nuclear war, we would basically crouch down and protect ourselves.

That was the principle. You know, a nuclear explosion is about to hit us, and if you get under your desk, things will be fine.

(Laughter) I didn't do very well in psychiatry in medical school, but I was interested. I believe this was a serious delusion.

(Laughter) Then we told people to go down to the basement and build a bomb shelter.

Perhaps it can be used as a study when there is no nuclear war, or as a TV room, or, as many teenagers have found, a very safe place to have a little privacy with their girlfriends.

And in fact, air raid shelters have many different uses.

Alternatively, you can buy a prefabricated bunker and bury it in the ground.

Well, let's say that we bought a prefabricated air-raid shelter at that time. A few hundred bucks for a fancy one, maybe as high as $500.

But what percentage of Americans do you think have had bomb shelters in their homes?

What percentage of people lived in houses with bomb shelters?

less than 2 percent. As far as we all know, about 1.4 percent of the population did something like making space in their basement or actually building a bunker.

Many buildings and public buildings all over the country, this is New York City, had these little civil defense signs, and the idea was that if you took refuge in one of these shelters, you would be safe from nuclear weapons.

And one of the greatest government delusions of all time, as we know it now, and we know their actions well from Katrina, happened in the early days of Federal Emergency Management Agency FEMA.

This is their first big public announcement.

They propose a plan of crisis relocation—there were six books written about it, in fact—subject to the US warning within three or four days that the Soviets were going to attack us.

The goal was therefore to evacuate the target city.

We move people from target cities to the countryside.

And I actually testified in the Senate about the utterly ridiculous idea of ​​actually being evacuated and actually getting a three or four day warning.

It was completely off the wall.

Even so, it turns out they had a different idea behind it - they were telling the public that it was to save us.

The idea was to have the Soviets retarget their nuclear weapons, making them very expensive, potentially doubling their arsenal, and destroying not only where they came from, but where people go.

It seems that this was behind it all after all.

I was really, really scared.

The point here is that we were dealing with a complete disconnect from reality.

Civil defense programs were disconnected from the reality we would see in an all-out nuclear war.

So, around 1979, groups like the Society of Socially Responsible Physicians began to make frequent public statements about this.

they will bomb. They go to your city and say, 'Here's a map of your city.

What would happen if there was a nuclear attack? ”

Therefore, there is no possibility of a medical response or meaningful preparation for all-out nuclear war.

Therefore, a nuclear war had to be prevented in order to survive.

This disconnect was never actually resolved.

And what happened was that we entered the second chapter of the era of nuclear threats, which began in 1945.

Chapter 2 begins in 1991.

When the Soviet Union collapsed, we virtually lost most of the enemies that could attack the United States.

It's not completely gone. Return the story.

However, from 1991 to the present, as highlighted by the 2001 attacks, the idea of ​​all-out nuclear war has diminished, and we have instead the idea of ​​a single event, the act of nuclear terrorism.

The scenario has changed a lot, but the fact is that our mental image of what nuclear war could mean has not.

So I'll quickly explain how it affects you.

So what is the threat of nuclear terrorism?

There are four key elements to explain it.

First of all, the world's nuclear arsenal stockpile, which I showed on the original map, happens to be uniformly insecure.

And it's not particularly safe in the former USSR, and now Russia.

There are a great many places where warheads are stored, and indeed many places where fissile materials such as highly enriched uranium and plutonium are not absolutely safe.

They can be bought or stolen.

They are available, let me say so.

The International Atomic Energy Agency has documented 175 nuclear theft incidents between 1993 and 2006, 18 of which involved highly enriched uranium or plutonium, key ingredients in nuclear weapons production.

Global stocks of highly enriched uranium are about 1,300 tons, with a lower limit of about 2,100 tons.

More than 100 megatons of this is stored in particularly unsecured Russian facilities.

How much of that do you think would be needed to actually make a 10 kiloton bomb?

Well, you need about £75.

So what I want to show you is what it takes to hold 75 pounds of highly enriched uranium.

This is not product placement. But the truth is, if I were Coca-Cola, I'd be pretty annoyed about this [Laughter], but basically this is it.

This is something that would have to be stolen or purchased from the relatively unsafe stockpile of 100 tons to create a bomb of the type used in Hiroshima.

Now let's look at plutonium as another fissionable material that could be used in bombs.

That means we need 10-13 pounds of plutonium.

Well, plutonium, 10-13 pounds, that's it. This is enough plutonium to build a Nagasaki-sized atomic weapon.

Now, in this situation, I'm already -- you know, I don't really like to think about this, but somehow I have a job where I have to think about it. So the point is that we are very, very apprehensive about developing this material.

The second is what is going on with the know-how.

And there is much debate about whether terrorist organizations actually have the know-how to build nuclear weapons.

Well, we have a lot of know-how.

There is an incredible amount of know-how in there.

There is detailed information on how to assemble a nuclear weapon from parts.

There are even books on how to make nuclear bombs.

There are plans on how to create a terror farm that can actually manufacture, develop and assemble all the components.

All of this information is relatively available.

If you have a bachelor's degree in physics, I would recommend it, which I don't have so it may not be true, but if it's anything close to it you could actually build nuclear weapons using the information currently available.

The third element of the threat of nuclear terrorism is who would actually do it.

Now, what we are seeing now is a level of terrorism involving highly organized individuals.

They are very dedicated and dedicated.

they are stateless.

Someone once said, Al-Qaeda has no reply address, so if they attacked us with nuclear weapons, how would they react, and who would they react to?

And they can withstand retaliation.

Clearly this whole concept of mutually assured destruction doesn't work, since there are people willing to actually give up their lives to do us so much harm, so we can't think of any real retaliation that would change anything.

Here is Sulaiman Abu Ghais. Sulaiman was an important lieutenant of Osama bin Laden.

He wrote a number of statements to the effect that "we have the right to kill four million Americans, two million of whom should be children."

And for whatever reason, you don't have to go abroad to find people trying to harm you.

McVay and Nichols, and the 1990s Oklahoma City raid, were prime examples of homegrown terrorists.

What if they had nuclear weapons?

The fourth factor is that US high-value targets are accessible, flexible and abundant.

This is a story for another day, but the level of preparedness that the United States has achieved since September 11, 2001 is incredibly inadequate.

What you saw after Katrina is a very good indicator of how unprepared the United States is for any major attack.

Seven million sea freight containers arrive in the United States each year.

Only 5-7 percent is tested, 5-7 percent.

This is Alexander Lebed, the general who cooperated with Yeltsin, who spoke and submitted to parliament this idea developed by the Russians, the suitcase bomb. The amount produced was very small, between 0.1 and 1 kilotonnes, with Hiroshima at about 13 kilotonnes, but enough to cause incredible damage.

And Mr. Lebed came to the United States and told us that many of the suitcase bombs, more than 80, were not actually responsible.

And they look like this: It's basically a very simple arrangement.

Put the elements in a suitcase.

It becomes very portable.

The suitcase can be easily placed in the trunk of the car.

You can carry it anywhere and make it explode.

I didn't want to build a suitcase bomb, but I happened to have one of the unsafe nuclear warheads that exist.

This is the same size as the bomb "Little Boy" dropped on Hiroshima.

It was 9.8 feet long and weighed 8,800 pounds. Go to your local truck rental, rent a truck of the right capacity for $50 or so, pick up your bombs, load the truck and you're good to go.

it can happen. But what does that mean, and who will survive?

It's impossible to get an exact number of such probabilities, but what I'm saying is that we have all the ingredients for such things to happen.

Anyone who ignores the idea that nuclear weapons could be used by terrorists is making fun of themselves.

I think there are a lot of people in the intelligence community, but a lot of people in this business in general believe that it's almost inevitable unless certain things are actually done to reduce the risk, like better containment, better prevention, better remediation, you know, better inspection of freight containers entering the country.

There are many things we can do to make us even safer.

At this particular moment, we may actually witness a nuclear explosion in one of our cities.

I don't think all-out nuclear war is imminent, but even that isn't entirely out of the question.

The superpowers still have enough nuclear weapons in their arsenals to destroy the Earth over and over again.

India, Pakistan, the Middle East, North Korea and elsewhere have flashpoints, and any use of nuclear weapons, even if initially localized, can quickly lead to a situation facing all-out nuclear war.

I am very uneasy.

please. OK.

I got back in my truck and crossed the Brooklyn Bridge.

We'll come down here and take the truck you just saw here somewhere in the financial district.

This is a 10 kiloton bomb, slightly smaller than the one used on Hiroshima. Finally, I would like to finish with some information. I think the concept here is something like "usable news."

First of all, this is scarier than we can imagine.

This is the ultimate.

And if you're within an 800m radius of where this bomb went off, there's a 90% chance you won't get there.

If you are in the place where the bomb was dropped, you will be vaporized. That's not good.

(Laughter) You assume that.

Within a 2 mile radius you have a 50% chance of being killed, but at about 8 miles away, we're talking instant death, the chance of being killed is between 10-20%.

What is important about this is that the experience of nuclear explosions is, first of all, that the temperature at the core where the explosion occurs is in the tens of millions of degrees Fahrenheit, and an extraordinary amount of energy in the form of heat, acute radiation, and explosive effects.

A huge hurricane-like wind blew and almost completely destroyed the building. It is within this yellow circle.

In conclusion, what I'm trying to focus on here is what happens to you when you're here.

Yes, if we are talking about the old days of all-out nuclear strikes, you here are as dead as the people here. So it was moot.

But what I want to say now is that if you survived the initial explosion, there is a lot we can do for you here.

If there is an explosion, so be it. By the way, if an explosion happens, don't watch it.

(Laughter) If you see this, you will be blinded temporarily or permanently.

So if there is some way to avoid it, like looking away, that's good.

If you were alive and near a nuclear weapon, depending on the size and exact location of the weapon, it would take 10-20 minutes to get out of the way before a deadly dose of radiation rained straight out of the rising mushroom cloud.

During that 10-15 minute period, all you have to do is move about a mile away from the explosion.

And what happens is -- this is -- I'm going to show you a plume of fallout. In less than 20 minutes, you'll be down. Within 24 hours, lethal radiation is released with the prevailing winds, mostly in one direction, the northeast.

And if you are near here, you must stay away from it.

So you are feeling the wind, and what you are about to feel is a tremendous wind. And you want to go perpendicular to the wind (neither upwind nor downwind).

If only I could actually see where the explosion in front of me was.

I have to get out of there.

If you don't get out of there, you will soon be exposed to lethal radiation.

If you can't get out of there, I want you to go into a shelter and stay there.

Now, being in an urban shelter means you need to be in the deepest possible basement or, in case of a ground explosion, above the 9th floor, i.e. high floors. Therefore, it must be on the 10th floor or higher or in the basement.

But basically you have to get out of town as soon as possible.

And if you can do that, you can actually survive a nuclear explosion.

Over the next few days to a week, the radiation cloud will pick up again and settle another 15 or 20 miles away, in this case over Long Island.

And it's clear that if you're in the direct fallout zone here, you either have to actually evacuate or you have to get out of there. But if protected, they can actually survive.

The difference between knowing or not knowing information about what you're going to do personally can save your life. That could mean the difference between 150,000 to 200,000 deaths from events like this one, or 500,000 to 700,000 deaths.

Therefore, planning for response in the 21st century is both possible and essential.

But as of 2008, no American city has an effective plan for dealing with a nuclear blast disaster.

Part of the problem is that emergency planners themselves are personally mentally overwhelmed by the idea of ​​a nuclear catastrophe.

they are paralyzed.

If you say "nuclear" to them, they'll think, "Oh my God, we're all gone. What's the point? Useless."

And we try to tell them, "It's not in vain.

You can change your survival rate by doing common sense things. ”

So the goal here is to minimize the number of fatalities.

And I would like to leave a personal point that you might be interested in.

The key to surviving a nuclear explosion is getting out unharmed.

That's basically all we're talking about here.

And the greater the distance, the longer the time since the first explosion. And the greater the distance between you and the atmosphere outside, the better.

So if you can break up, if you can stay in dirt or concrete or in a basement, distance and time will save you.

So here's what you should do: First of all, like I said earlier, if possible, don't stare into the flashlight. I don't know if you can resist doing so.

But let's assume you want to do that in theory.

I want to keep my mouth open so the pressure doesn't rupture my eardrum.

If you're very close to what happened, you should really stoop down and cover, as Burt said, Burt the Turtle.

And if possible, you want to go under something to avoid getting hurt or killed by the object.

I said I wanted to escape the first fallout mushroom cloud in a matter of minutes.

and shelters and places. Suppose you want to travel 1.2 miles along a crosswind [only].

If you're outside and see a building heavily destroyed in that direction and less destroyed here, you know there was an explosion over there, and as long as you're going sideways into the wind, you're going this way.

Once you're out and evacuated, you want to keep as much skin and mouth and nose covered as possible, as long as it doesn't interfere with movement or escape.

And finally, it should be decontaminated as soon as possible.

And if you're wearing clothes and you're undressing, you're going to have a shower somewhere to clean up any radioactive material that could fall on you.

And they want to stay in the shelter for at least 48 to 72 hours, but they wait hopefully. You'll be waiting for people to tell you when it's safe to go outside with a small hand-wound, battery-free radio. that's what you have to do.

In conclusion, nuclear war is less likely than it used to be, but it is by no means out of the question, nor is it viable.

Nuclear terrorism is possible – it may be more likely – but it is possible to survive.

And this is Jack Geiger, one of the heroes of public health in the United States.

And Jack said the only way to deal with nuclear weapons, be it war or terrorism, is to abolish them.

And if you want to do something about solving global warming, I would like you to consider the fact that something must be done about this unacceptable and inhumane reality of nuclear weapons in our world.

Well, this is my favorite civil defense slide. And I -- (laughter) -- I don't want to be rude, but this -- he's out of office. I don't really care, okay.

This was sent to me by a fan of civil defense procedures, and the truth is that America is going through a very difficult time.

We weren't focused, we weren't doing what we were supposed to be doing, and now we're facing the possibility of the worst hell on earth.

thank you.

[Fucking] This is definitely the final stage of animal design.

(Laughter) But the reason I put this here is that when I went to Africa last year, my wife and I were driving around and our wonderful guide showed us both something that surprised us. And because it became very apparent in terms of the fascination that comes with animal designs.

It turns out that around the 1880s, missionaries came to Africa to teach English to the natives in order to spread Christianity.

And they brought blackboards and chalk.

Imagine, this is a chalkboard and you just put chalk on it.

And they brought a good deal of this.

But as the years went by, I ran out of chalk even though the blackboard was fine.

And this is a real crisis for them.

And then there are the hyenas.

Hyenas are perhaps the world's most perfectly engineered carrion-eating animals.

Hyenas strip carcasses and have amazing teeth. Because this allows hyenas to essentially eat bones.

The final product of that action is now posted here.

What missionaries do is walk around and pick up hyena poop.

The great thing about hyena poop is that it makes great chalk.

(Laughter) That's not what I want to talk about here, but that's the fascinating aspect of animal design.

I want to talk here about camels.

When I started talking to Richard about what I was going to talk about, I had just returned from Jordan, where I had a wonderful experience with camels.

(laughter) And we were in the desert.

Richard Warman: That's it! Keith Bellows: Yes, yes.

We were in the Wadi Rum desert in a small jeep.

There were four of us and two Bedouin drivers.

Please try to imagine. This vast sea of ​​sand is 105 degrees, one bottle of water.

And we were in the very best jeep they said.

I didn't see it.

Then, when we started going through the desert, the jeep broke down.

The men got out of the car, put the hood on, started working under the hood, and started working again.

It broke down after about 100 meters.

This continued for about 6 or 7 times, and we became more and more alert as we went deeper into the desert.

And finally my worst nightmare happened. My engine is flooded.

And they said, "Oh, no problem, just go out and walk."

And we said, "Shall we go out and walk?"

One bottle of water, remember, folks, four people.

Then they said, "Yes, yes, let's go on foot. Let's find a camel."

We walked outside and, sure enough, after about 800 meters, we crossed the top of this hill and saw a large group of Bedouin people with camels.

The guy went up and started making noise and after $10 we got 4 camels.

They went down like an elevator. we rode them

They climbed back up, and the Bedouins, four by four, caught up with the camels with little whips.

And they began to cut behind the camel and began to gallop.

If you've ever ridden a camel, you'll find that camels are a very, very uncomfortable ride.

This camel also has another side.

About every 10 steps, they lean back and try to rip off a chunk of your leg.

(Laughter.) So we kept going and this camel kept trying to get my leg lumps out.

And finally, after three miles, we reached our destination, where a jeep was to pick us up.

And the camels come down again like an elevator and we go down clumsily and obviously they try to rip another chunk off my leg.

And at this point I had such a great relationship with this creature that I realized this was a mean bitch.

By the way, he was much meaner than the Bedouin who greeted me and tried to sell me one of his 26 daughters to bring back to the United States.

So when Richard and I were talking, I said, "Look, maybe we should bring a camel."

It's the best designed animal in the world. ”

He said, "Oh, I don't want to take the camel with me."

And you should be really happy that we decided not to take camels.

So I did the next best thing.

I went to the Washington Zoo.

Richard said, "I want you to see this camel up close.

Examine its mouth and see its teeth.

go under it. Let's go over it. go around it.

pull up the tail. look over there

I want you to get as close to the camel as possible. ”

So I hired a National Geographic film crew.

We went there and had one look at this camel.

A 2,000-pound creature in heat.

(Laughter.) Now, if you've ever seen a 2,000-pound camel in heat, it's pretty scary.

And if Richard thought I'd be in the ring with that camel, someone would be smoking fine Bedouin cigarettes.

(Laughter) So we got as close to that as we could, so I'm going to share this.

Chris, if you want to show this movie.

Now let's talk a little bit more about the camel design.

Do you roll film?

(adventure music) (video) Hello. This is Keith Bellows from TED National Geographic's Camel Research Unit.

Came to see the ultimate desert machine.

(music continues) Keith Bellows: And having been around this camel all day, you must have noticed that I started chewing gum.

(Video) That's it. no!

You see, he's a little too excited.

Therefore, we have to be very careful around him. don't let him catch you.

Then you can see that there is a lot of saliva in it.

I always called myself the unstable stable boy.

Their noses, you can see his nose widening now.

When in heat, seals are similar to seals in that they must open their noses to breathe.

And they are similar. You have to consciously open your nose.

KB: What about your ears?

SK: It's small. However, they have excellent hearing.

But not big. Zebras, for example, have large ears that are so mobile that they can actually rotate both of their ears.

And they use them just like we use binocular vision.

They use it to identify sounds.

The desert is windy and very cold.

I mean, not only do they have very long eyelashes, but they also have secondary eyelashes, which I think they call [unintelligible] or something.

It is this hair that is above the eyes, and below it is longer.

Most people think that the humps hold water.

it's not. they store fat.

I'm no chemist, but basically what happens is that fat is oxidized by breathing.

And it turns into usable water.

Like many predators, they walk on their toes.

But there are big fat pads there that get crushed.

They are like sun shoes, but with sand in them.

Hoofs? They don't have traditional hooves, but they do have something like large claws.

(audience laughter) You can't see it very clearly. My fur has grown quite a bit.

However, they often use their tails, especially during the mating season.

He urinates and turns his tail to spread the urine around and make him more attractive.

I don't know why that would be the case, but it worked for them.

So what is it?

(audience laughter) Now they also defecate in specific places.

Normally they will poop wherever they like, but during estrus they will poop in the surrounding area.

I don't know if you've read or heard about elephant subsonic sounds, but you know what I mean, sounds like "Br-r-r!"

This big big rumbling sound. he will do the same.

You can actually see it vibrating here.

We weigh animals.

Unfortunately, he is such an aggressive animal that he actually destroyed some of his scales.

For example, there was a large one that weighed a bison.

I believe he weighs at least 1,600 pounds.

But I think I'd get him closer to 2,000.

He's basically a pile of walking mulch.

We are like buds, but I am also a man.

KB: Does he see you as a competitor? Senior Keeper: Yes, that's right.

And put him in great danger during this period.

don't think about it. Don't think!

But now we will meet. Outside!

outside! outside!

no.

outside!

(music) (applause) KB: What I didn't show you was that you were moving that swinging thing?

Well, I'm glad I didn't show you this.

Another beautiful camel design is that its penis is facing backwards.

Then the camel can dip its tail into the river and mow down all around it.

And that's how he actually marks his realm.

Well, what you didn't even notice, you might have noticed the enclosure next to him. By the way, the camel's name is Suki.

Inside the pen next to him is Jasmine.

Jasmine has been his companion for some time.

But on this special occasion, as excited as Suki was, it was very clear that Jasmine wasn't having it at all.

So we started thinking.

Now, if poor old Suki were looking for a mate, what would Suki do to find the perfect one?

Let me introduce you to another movie.

Before that, I just want to say that this animal is just like an SUV in the sand, a ship in the desert.

Camels are so important to the inhabitants of camel-inhabited regions (mainly Mongolia and the Sahara) that there are 160 Arabic words for camels.

And if this is a creature designed by a committee, it's certainly unlike any committee I've ever been on.

Here's what Suki does to find a spouse.

Can you roll it for me?

A camel seeking a camel A lustful beast desires an attractive and loyal mate.

I'm 7 feet tall, I weigh 2,000 pounds, I have brown hair and eyes, long legs, and I'm pretty... saggy.

My name is Ted Cammell.

A perfect desert machine.

I design smartly.

Eyelashes that keep out sand and a third eyelash that acts like a wiper.

Distinctive Nose - Features lined nostrils to filter sand and dust and grooves to catch moisture.

With surprisingly full lips, it can eat almost anything that grows on it.

I have calluses on my knees and can comfortably kneel.

A leather-like chest pad to keep out the heat.

Short fur to keep you cool.

Long legs for heat dissipation.

and my hump?

Ogden Nash once wrote, "A camel has one hump, but a dromedary has two or vice versa. I have no idea. What about you?"

The hint is Bactarian.

Dromedaries.

My hump contains up to 80 lbs of weight. Contains fat but does not store H2O.

I am built to last.

I'm the go-to animal when the oasis dries up.

I usually don't sweat until my body temperature reaches 105°F, which is enough to bake an egg.

I was able to lose 40% of my weight without dying.

(Most animals will drink even if they lose half of it.) I drink 5-7 gallons of water a day.

But don't eat for more than a month.

I am strong.

Packs up to 400 lbs. of freight.

You can outrun horses -- 42 miles in good weather.

Camelot.

Jackie O once said that traveling on a camel is like riding an elephant is like riding a jet plane.

Still, my big, soft feet keep me on the sand.

(Is that why Bedouins claim I can dance?) I'm a good provider too.

The Bedouins call the camel a gift of God.

No surprises.

Tents and rugs are made from my hair.

My dried bones are prized as a kind of ivory.

My feces are burned as fuel. My milk is used for cheese.

"Camels are like angels," a Bedouin once said.

(Applause.) Thank you. One last thought, and perhaps the most important one.

Humans are very lucky creatures. Because they generally don't have to adapt to their environment. We adapt our environment to ourselves.

And we've seen it repeatedly throughout this conference, not just this year but over the past few years.

But this creature you just saw will eventually adapt, adapt and continue to adapt.

I think that's one of the most remarkable things when you look at the animal kingdom.

There is no environment for it. You have to adapt to your environment.

Ricky, thank you so much for having me.

RW: That's amazing. thank you.

We need to put the best that we can offer within reach of our children.

If we don't, we'll get a generation that deserves it.

They intend to learn from what is around them.

And elites, parents, librarians, professionals, whatever it is, a lot of what we do is really trying to get the best we can offer, within the reach of those around us, or as far as we can go.

I would like to begin and end this story with a few things carved in stone.

One is at the Boston Public Library.

"Free to All" is engraved above the door.

This is a bit of an emotional statement, but I'll touch on it one last time.

I am a librarian and want to make all works of knowledge available to as many people as possible who want to read them.

And the idea of ​​leveraging technology is perfect for us.

I think we have a chance to beat the Greeks.

Beating the Greeks is not easy. However, thanks to the diligence of the Egyptians, they were able to build the Library of Alexandria. It envisions copying every book for every person in the world.

The problem was that we actually needed to go to Alexandria.

On the contrary, if I had done so, something wonderful would have happened.

I think we can surpass the Greeks and achieve something.

And I would like to make only one point today. It means that universal access to all knowledge is within our reach.

So if I succeed, you'll actually go home thinking, yes, we've actually achieved the great vision of everything that's ever been published, everything that's ever been intended for distribution, available to anyone in the world who wanted to have access to it.

Yes, there is an issue as to how the money should be distributed, which is still being considered.

But there's a lot of money and a lot of demand, so I think it's actually possible to achieve it.

But I'm looking at where we are technically, socially, and where we are as a whole, trying to arrive at that particular vision.

The way I'm going to do this is just like with the Amazon.com website, books, music, and videos, I'll just step through each media type and say, "Okay, what's going on here?"

So where are we if we start with books?

First, as an engineer, you need to identify the scope of the problem. how big is that?

How big a problem would that be if we wanted to put all published work online and make it available to everyone?

Well, I don't really know, but the world's largest print library is the Library of Congress. 26 million, 26 million.

This is by far the largest print library in the world.

And if you have a book, the book is about 1 megabyte. That is, if you created your book in Microsoft Word.

So 1 megabyte, 26 million megabytes is 26 terabytes, and so on, mega, giga, tera. 26 terabytes.

26 terabytes fits in a computer system this size with a spinning Linux drive and costs about $60,000.

So for the cost of a house, or garage around here, you can spin every word in the Library of Congress.

It's very beautiful, isn't it?

So the question is, what do you get?

Is it worth trying to get there?

Do you really want it online?

Some of the first things people do is build book readers that let you search inside books, and that's kind of fun.

You can download these things and explore them in new and different ways.

If you have a laptop, you can access it remotely.

We're starting to see some of these page-turning interfaces that look a lot like books in some ways, allowing you to search for books and create little tabs on your laptop, and it's kind of cute -- but still very bookish.

But reading a book on my laptop always makes me feel like I'm working.

I think that's one of the reasons the Kindle is great.

You don't have to feel like you're at work to read your Kindle.

It's starting to get more specific.

But I have to say there are older technologies that I tend to prefer.

I like physical books.

And I think with our technology, we can digitize things, put them online, download them, print them, bind them, and finally make them into books again.

And we said, "How hard is this?"

And it turns out it's not that hard.

I actually went to make a bookmobile.

And the Bookmobile -- the size of a van with a satellite dish, printer, binder and cutter, lets kids build their own books.

It costs about $3 to download, print and bind a regular old book.

And it actually looks better too.

In fact, really good looking books can be had for around a penny per page. It's kind of like the parts bill for doing this.

So the idea is that this technology might actually put books back in people's hands.

There are also a few other bookstores running around.

This is Eric Eldred making a book at Walden Pond -- Thoreau's work.

This was shortly before he was kicked out of the Parks Service Department for competing with a bookstore.

A few more bookmobiles are rolling around in India.

And today is the opening day of the new Library of Alexandria, Egypt's Library of Alexandria.

It was quite a success.

And children who have started making their own books, and children who are happy with their first books.

So the idea of ​​using this technology to end up using paper to be able to do some sort of thing sounds a bit retro, but I still think it has a place.

And coming from Silicon Valley, a sort of utopian world, we thought, if we could bring this technology to rural Uganda, we might be able to do something about it.

So we actually got funding from the World Bank and tried it out.

And within about 30 days, I found that I could take a few people from Silicon Valley and fly to Uganda, buy a car, set up the first internet connection at the National Library of Uganda, figure out what they wanted, and start a book-making program in rural Uganda.

And actually, it technically works.

What this taught me was that I didn't have the right book.

So the book was in the library. If it was digital, I could reach people, but I didn't know how to make it fully digital.

Everyone thought the answer was to send things to India and China.

So we gave it a try. More on that later.

There are also some new technologies for delivery that are actually very exciting.

One is a print-on-demand machine similar to the Rube Goldberg machine.

We have one of those now. It's completely cool, isn't it?

It's all a conveyor belt and that makes the book.

It's called an "Espresso Book Machine," and you can make a book in about 10 minutes at the push of a button.

Another thing that I'm very excited about in this particular area, beyond this kind of kiosk where you can get books on demand, is some new little screens.

One of my favorites is the $100 laptop.

Not trying to steal anything here, but I tried using one of these things as an e-reader.

Here is one of the beta units. It turns out that this is actually a very nice looking e-reader.

And I did a quick hack to place the book, and found that 200 dots per inch meant I could place the scanned book very nicely.

200 dots per inch, equivalent to a 300 dot printing laser printer.

We are in good enough shape.

In fact, you can go read your scanned book very easily.

This is where the concept of e-books began to emerge.

But how do we do all this scanning?

So we thought, OK, let's try sending books to India.

And then there was the National Science Foundation-funded project where they were going to send a bunch of scanners and the American libraries were going to send the books.

Well, they didn't. They didn't want to send the book.

So we bought 100,000 books and sent them to India.

And now I understand why you don't want to send books to India.

The lesson I learned from this is to scan your own books.

If you really care about your books, you'll scan them better, especially if they're of good value.

If it's a new book and you can dismantle it so you can just buy another one, it's not that big of a deal in terms of doing quality scans.

But do what you like.

But the Indians are doing a lot of scanning of their own books (currently around 300,000) and they are doing very well.

There are more than 1 million Chinese and about 30,000 Egyptians.

But we sent it -- we thought, okay, if we have to do this, let's do it at the library.

How do you do this and how do you keep costs to an acceptable level?

And I chose a price range of 10 cents per page.

If it was the basic Xerox cost of being able to basically digitize, OCR, package, download, print, bind, the whole cost, we would have achieved something.

So we started by understanding it. How do you get to 10 cents?

And we tried these robot features and they worked quite well - a sort of automatic page turning feature.

With a Mars rover, you would think you could turn the page.

However, it's actually pretty hard to turn the pages and doesn't have a lot of volume.

Anyway, we ended up creating our own book scanner, using two high-end professional digital cameras and controlling the museum lighting so that we could get the proper intonation even for black and white books.

So basically you are doing beautiful and respectful work.

This is not a fax, this is the idea of ​​doing a beautiful job when browsing these libraries.

And we were able to hit 10 cents per page if we did it in bulk.

Here's what it looks like at the University of Toronto.

And, in effect, you will be paying a living wage.

People seem to like it.

Yes, it's a little boring, but some people get hooked on the Zen world.

(Laughter) And even more so if it's an interesting and interesting book written in a language you can read.

In fact, we were able to do a pretty good job with this and get 10 cents per page.

So 10 cents per page, 300 pages for the average book, $30 per copy.

If the Library of Congress does all 26 million books, that's about $750 million, right?

But I think 1 million is actually a pretty good start, but it costs $30 million. That's not a very big bill.

And what we were able to do is walk into the library.

We currently have eight scanning centers in three countries, and libraries accept book scans.

The Getty company here is moving the books to UCLA, where they have a scanning center that scans out-of-copyright books. This is great.

Therefore, we are beginning to take on organizational responsibility.

We are short of 10 cents.

If you can get your 10 cents, all the rest will flow.

About 200,000 books were scanned.

We are currently scanning about 15,000 books each month and have started doubling from there.

All in all, I'd say it's going very well.

And we are beginning to move from a world of just out-of-copyrights to a world of out-of-prints.

That's where I think. We are moving out of the out-of-copyright library stuff, and Amazon.com is moving out of the print world.

And I think we're going to meet somewhere in the middle where the classics -- the publishing system and the library system -- are going to work side by side.

That's why we're launching a program to lend out-of-print works.

I'm not quite sure what you mean by financing.

But anyway, we're trying out this model of where libraries stop and bookstores take over, lending out-of-print works from the Boston Public Library, Woods Hole Oceanographic Institution, and several other libraries that are starting to participate in the program.

So it is possible to do this at scale.

We also plan to retroactively publish the microfilms online.

That means you can do it for 10 cents per page, sell 15,000 books each month, and if you include all the other projects that are starting to add, there are about 250,000 books online.

So what I wanted to argue is that books are within our reach.

The idea of ​​taking on an entire ball of wax isn't that big of a deal.

Yes, the cost is in the low tens of millions to hundreds of millions of yen, but you can get the history of basically printed literature online in one go.

And then there's also the business model question of how to effectively market it and reach people.

But technically and legally, we believe everything will be available online, at least for out-of-print and out-of-copyright material.

Now let's talk about audio. I will explain these.

So how much do you have?

As far as we know, 2-3 million discs have been published so far. In other words, it includes records and CDs from the 78's. At least, this is the largest archive of published material we could identify.

If you do a lot of work, it costs about $10 per disc to get the discs out and put them online.

However, the rights issue turned out to be very thorny in practice.

It's a fairly litigious field, so it turns out that there are niches in the world of music that the classic commercial publishing system doesn't serve very well.

And we're starting to make these available by offering shelf space online.

In the United States, it costs nothing to give something. right?

If you donate something to charity or the public, you will get compliments and tax donations. However, the Internet is an exception, and it can also lead to bankruptcy.

If you post a Garage Band video and it starts getting traffic, you could lose your guitar or your house.

This makes no sense.

That's why we offer unlimited storage and unlimited bandwidth for free, forever, to anyone who has something to share in their library.

And we get a lot of participants. One is a rock'n'roller.

Rock'n'rollers had a tradition of sharing as long as no one made money. It's possible -- concert recordings, not commercial recordings, but concert recordings initiated by the Grateful Dead.

And about a couple of bands sign up a day.

They have permits and 40-50 concerts a day.

We've put about 40,000 concerts, everything the Grateful Dead has ever done online so people can see it and hear this song.

So while it is possible to list audio, the rights issue is very thorny.

We currently have a large collection containing hundreds of thousands of items and growing over time.

Videos: When it comes to theatrical releases, there aren't that many.

As far as we know, there have been about 150,000 to 200,000 films ever made that were actually intended for large-scale theatrical distribution. But not so many.

But half of them were Indians.

Anyway, it's doable, but I've only found about 1,000 of them out of copyright.

So we digitized them and made them available.

But it turns out there are a lot of other types of movies that never really saw the light of day: archival movies.

We also found a lot of political movies, a lot of amateur movies, basically all sorts of things that need a home, a permanent home.

So we started offering these and they have grown to be very popular.

We are not a full YouTube.

We tended to like things that were long-term and things that people could reuse and make new movies with, but it was a lot of fun.

TVs are quite large.

I started recording 20 channels of TV 24 hours a day.

It's like the biggest TiVo box I've ever seen.

So far, this equates to about petabytes of television from all over the world, including Russia, China, Japan, Iraq, Al Jazeera, BBC, CNN, ABC, CBS, NBC, etc., broadcasting 24 hours a day.

We only covered one week, mainly for cost reasons, and it was 9/11, 9/11/2001. What did the world see for a week?

CNN reported that Palestinians were dancing in the streets.

Is that so? Let's find out by watching Palestinian television.

How can we have critical thinking without being able to quote and compare what happened in the past?

And TV is horribly unable to record or quote, except for John Stewart who does a great job.

Anyway, I think TV is within our reach.

So $15 an hour of video, about $100 to $150 an hour of celluloid, is a very cheap way to get material online and put it online.

And now we have a lot of these materials.

So there are about 100,000 works out there.

So books, music, videos, software. There are only 50,000 titles.

Most of the issues are legal issues and removal of copy protection.

But while we have resolved some of them, Washington still has serious problems.

Well, we are best known as the World Wide Web.

We've been archiving the World Wide Web since 1996.

We take snapshots of all websites and all pages on them every two months.

And in fact, it was pioneered by Alexa Internet, who donated this collection to the Internet Archive.

It's been growing over the last 11 years and is a great resource.

And I created a Wayback Machine that allows you to see old websites as they were back then.

Try searching for something, this is Google.com. The different versions of it that we have, this is what it looked like in the alpha release, and what it looks like at Stanford University.

Anyway, I basically understood where things came from.

Most of the time people want to see their old stuff in this.

If there's one thing you want to learn from Version 1 of the Library of Alexandria, perhaps the best-known version of Burning, it's that you shouldn't have just one copy.

So we started -- we made another copy of all this and actually put it back in the Library of Alexandria.

This is a photo from the Internet Archive of the Library of Alexandria.

And now another copy is also being built in Amsterdam.

Therefore, it should be placed on the San Andreas Fault Line in San Francisco, in the flood zone in Amsterdam, and in the Middle East. Well, anyway...

So we are hedging our bets here.

I think it will be in good shape if we put it in a few more places.

There are political and social issues here.

Will all of this become public or private as it becomes more digital?

There are some large companies that have recognized this vision and are going digital at scale, but they are locking the public domain.

The question is, is that the world we really want to live in?

What will be the role of public and private institutions in the future?

How do we achieve a world in the future where we both have libraries and publications, just as we have basically benefited from growing up?

So, I believe universal access to all knowledge could be one of humanity's greatest achievements, like mankind on the moon, the Gutenberg Bible, or the Library of Alexandria.

It may be something we will remember for thousands of years for what we have achieved.

As I said before, it ends with a carving above the door of the Carnegie Library.

Carnegie, one of the country's great capitalists, engraved "Freedom for the people" on his legacy.

thank you very much.

When I found out you were coming to talk to me, I thought, "I should call my mother."

I have a little Cuban mother. she's that big

four legs. There is nothing greater than the sum of her concrete parts.

are you still with me (laughs) I called her.

"Hello, how are you doing, baby?"

"Hey mom, do you have something to talk about?"

"You already talked to me. What's wrong?"

I said, "I have to talk to a lot of nice people."

"Except when I go to the White House, I always talk to nice people."

"Mom, don't start!"

And when I told her I was coming to TED, she said, "What's the problem?"

And I said, "Well, I'm not sure."

I said, 'I have to talk to them about the story.

It's 'technology, entertainment, design'," she said.

(laughter) I said, "You're a peach, Mom. Shall we go there?"

"What's the matter? Are the pearls of wisdom that fly out of my lips like lemmings and are of no use to you?"

(Laughter) And my pop got on there.

Hey, he's one of the old souls, you know, an old Cuban man from Camaguey.

Camaguey is a province of Cuba.

he's from florida.

He was born there in 1924.

He grew up on the Bohio soil bed, and the structure was of the kind used by our old Arawak ancestors, the Tainos.

My father is quick-witted, terrifyingly funny, and all at once poignant and breathtaking.

"Papi, help me"

"I've heard what your mother said. I think she's right."

(Laughter) "After what I just said?"

My father has been there all my life.

So we talked for a few minutes and he said, "Why don't you tell them what you believe?"

I really like it, but I don't have the time.

Good storytelling is creating stories that people want to hear.

Great stories are the art of letting go.

So let's talk a little bit.

Remember, this tradition did not come out of the mists of Avalon, but far back in time, even before we wrote these stories on papyrus, and painted pictographs on the damp, damp walls of caves.

At the time, we had the urge and the need to tell stories.

When Lexus wants to sell you a car, they will tell you the story.

did you see the commercial?

Because we all have a desire to tell our story and be heard, once and for all.

There is a story told from the stage.

There are stories told in small groups while sipping delicious wine.

And maybe once in my life, I also have a story to tell my friends late at night.

And so are the stories we whisper into the darkness of Stygian.

I'm not telling you that story.

i say this to you

Its name is “You’re Going to Miss Me”.

It's about human connection.

My Cuban mother, briefly introduced in a short character sketch earlier, came to the United States 1000 years ago.

I was born in 19 years. I forgot, I came to this country with them in the aftermath of the Cuban Revolution.

From Havana, Cuba to Decatur, Georgia.

And Decatur, Georgia is a small town in the South.

And in that little southern town I grew up and grew up hearing these stories.

But this story happened just a few years ago.

I called my mother.

It was Saturday morning.

And I was calling about how to make ajiako. Cuban food.

that's delicious. It's delicious.

I spit foam in the corner of my mouth, is that enough? Will your armpits be juicy?

That kind of food, yes.

This is the sensory part of the program, folks.

I called my mother and she said, 'Carmen, I want you to come.

I have to go to the mall, and your dad already knows, he's taking a nap in the afternoon, so I have to go.

I have something to do. ”

Please allow me to pause here in brackets. My mom, Esther, gave up driving a few years ago for the Atlanta-wide relief effort.

Ever since I was a little girl, when I went out with her in the car, the blue light was flashing as a matter of course.

But she got better at avoiding the boys in blue, and when she actually met them, oh, she had a great, well, great relationship.

"Ma'am, did you know that was the signal that just came running?"

(Spanish) "Don't you speak English?"

"no."

(Laughter) But at the end of the day, every dog ​​has its own day, and in the end she went to traffic court and negotiated with the judge for a discount.

There are historical markers.

But now, in her 70s, she stopped driving.

In other words, the entire family had to register to have her hair dyed. It's that distinctive blue that goes well with her polyester pantsuit. It was the same color as the Buick.

who? have understood.

Slightly pinch the leg where she will stick the needle, leaving a small loop.

Rockport -- they're there for this.

That's why they call it so.

(Laughter) This is her ensemble.

And this lady wants me to come on Saturday morning when she has a lot to do, but Cuban guilt is heavy so it won't take long.

I'm not going to say anything political to you... so I'm going to my mother.

Appear. She is in the carport.

Of course there is also a carport.

It's the one with the corrugated roof.

A Buick is parked outside and she jingles her keys.

"I got a surprise, baby!"

"Would you like to bring your car?"

"It's not us, it's me."

And she reached into her pocket and pulled out a catastrophe.

someone's story. interactive art. You can talk to me.

Oh, a driver's license, a perfectly valid driver's license.

Apparently issued by the DMV in Gwinnett County, where she lives.

Cheerful fucking idiots.

(laughs) "Is that real?" I said.

"I think so."

"can you see it?"

"I think you have to."

she gets in the car She sits on top of two phone books.

She's so small she can't even make up for this part.

She designed an umbrella to do just that - bang! -- Slam the door.

Her daughter, me, the village idiot with an ice cream cone in the middle of my forehead, is still standing there with my jaw loose.

"Are you coming? Are you not coming?"

I said, "Okay, okay. Does Pop know you're driving?"

"are you kidding me?"

"How is it going?"

"He must sleep someday."

So we left my father sound asleep. I knew that if I let my father go alone, he would kill me. and we got in the car.

Place it upside down. 55 minutes from the road and in the opposite direction.

I fasten my seat belt from the front.

I will pull you from behind. I have a double knot.

I mean, my mouth is dry like the Kalahari desert.

Doors have white knuckle grips. You know what I'm saying

And she whistles, and at the end I breathe like childbirth.

Um, uh, um, only a few women. right.

And I said, "Mommy, can you take it easy?"

Because she's now on Highway 285, which wraps around Atlanta. There are 7 lanes and she drives them all.

I said, "Mom, pick your lane!"

"They give you seven lanes and expect you to use it."

And there she goes, yes.

I can't believe for a moment that she left and couldn't be stopped.

So, well, I think we can talk. It will change your mood.

It will help me breathe. It may have some effect on the pulse.

"Mom, I know you stopped me."

"No, what are you talking about?"

"You have a license, how long have you been driving?"

"Four or five days."

"Yes. So you couldn't stop it?"

"I couldn't get a ticket."

I said, "Yeah, yeah, yeah, yeah, but come on, come on, come on."

"So I stopped at a traffic light and there was a man behind me."

"Does this man, for example, wear a blue uniform and look frightening?"

"You weren't there, don't start."

"Now, do you have a ticket?"

"No," she explained, "that man--he must say the same as she does, otherwise he will lose something--" "He comes to the window and does this. You can see that he is quite old.

So I look up and think maybe he still thinks I'm cute. ”

"Mom, are you still doing it?"

"If it works, it works, baby.

So I say, "Peldon, no Habro Ingles." Well, didn't you know, he was in Honduras for the Peace Corps. ”

(Laughter) So he's talking to her, and at one point she said, "Okay, it's over. That's it. It's over."

"Eh? What?

Did he give you a ticket? Didn't he give you a ticket? what? "

"No, when I look up, the light transforms her."

(laughter) You should be scared.

Well, I don't know if she's toying with me. It's like a cat hitting a mouse back, right foot, left foot, right foot. But now we're at the mall.

Well, you all went to the mall during the holidays, right?

talk to me. yes. yes. I can say yes.

Audience: Yes.

Carmen Agra Didi: Okay, so you know you've entered parking lot purgatory, praying to that eternal availability saint that as you join a meandering line of crawling cars, someone will turn on your brake lights the moment you pull over behind him.

But that doesn't happen most of the time, right?

So first I say, "Mom, why are we here?"

"I mean, in the car?"

"No, please don't -- why are we here today?

it's saturday It's a holiday. ”

"Because I have to change my father's underwear."

Now, look, this is a Machiavellian way of thinking, and it really has to be -- you know, in my head, it's like a rabbit, this woman's mind.

Unless Ariadne's clues are fixed, do I want to go in? Enough metaphors?

But you know.

(laughter) "Why do we have to take Pop's underwear back now?"

why? what happened to his underwear? ”

"It will upset you."

"It doesn't upset me. Why? What? Is there something wrong with him?"

"No, no, no. The only thing he has is that he is a fool.

I sent him to the store and this was my first mistake, he went to buy underwear and he bought grippers and was supposed to buy boxers. ”

"why?"

"I read on the Internet, you can't have children."

"oh my god!"

(laughs) Olivia? teeth? teeth?

Well, we crawled another four feet, and finally my mother said to me,

i am an immigrant we create space What do I tell you? right there. "

And she pointed out the passenger window and I looked out and three, three, down the aisle and said, "Look, Chevrolet."

I want to laugh, but I don't know - you're being politically corrected, do you realize it?

Now fix it in the opposite direction. fine.

"Hey Chevrolet, it's over here."

"Mom, mama, mama, wait, wait, wait. The Chevrolet's three down the aisle."

She looks at me like I am her. You know, her stupid child, Cretin, who she has to speak very slowly and clearly.

"I know that, honey. Get out of the car and stand in the parking space until I get there."

Yes, I would like to vote. Come on. no no

How many of us, as children or adults, have stood in a parking space to drop off someone's car?

Look, we are a secret club that holds secret handshake events.

(Laughter) And after years of treatment, we are recovering well.

we are doing well. We are doing well.

Well, I confronted her.

This is—you see, I think I am now—and do you still have it?

I said, "No way, Mom, you've been humiliating me all my life."

Of course, her comeback is "When did I bother you?"

(Spanish) And while she parked the car, applied the emergency brake, and opened the door, she was still talking, jumping out of the car with surprising agility for a woman her age, knocking out the phone book, and then she walked around—she had a cheap Kmart purse—around the front of the car.

She has incredible land speed for a woman of her age.

Unbeknownst to me, she waded across the parking lot and between the car and the people behind me, doing her typical holiday religious charity.

"I'm going now." Italian hand signals follow.

I run over. close the door. I will leave the phone book.

This is new and fast, so are you still with us?

We are looking forward to seeing you late. OK.

I start, and this is where the child tells me -- and the story doesn't work if I've told her before, because this is my brief child.

Everything is simple, simple with this child.

As you know, she eats in small portions.

Language is expressed in small phonemes. Just a little bit, hmm, hmm.

She has a mean spiral notebook and a pen.

she has great power.

she listens. Because that's the first thing the storyteller does.

But sometimes she would stop and say, "How do you spell it? What year? OK."

Don't believe a word of it when she writes a revealing article some 20 years later.

But this is my daughter, Lauren, my wonderful daughter, a borderline Asperger's kid.

Rest in peace, Dr. Watson.

She says, "Mom, look!"

Now, if this kid says I have to see, I see.

But it's not that I've never seen this crime scene before.

I grew up with this woman.

I said, "Lauren, you know, give me a rundown. I can't do that."

"No, Mom, look at me."

Must see. please look.

don't you want to see

she is there

I looked in bewildered awe. She is standing, sitting on the ground, although Lockport is slightly away.

She holds out a cheap Kmart wallet and swings it around.

She holds back masses of steel with the sheer power of her little personality, and says things like, "Come back, buddy! No, it's reserved!" in that crone-like voice.

(Laughter) Are you ready? Here we come

"No, daughter, I'm coming in a Buick.

Honey, sit down so they can see you. ”

Oh Jesus. Oh Jesus.

It's finally here, and now it's the South.

I don't know which part of the country you live in.

I think we all secretly love stories.

We all secretly crave blankets and boo bears.

We want to curl up and say, "Tell me, tell me."

Come on, honey, tell me about it. ”

But in the South we love a good story.

People stepped aside, that is, out of the row of rows, took off their trunks, took out lawn chairs and cold drinks.

A bet is made.

"I'm with the young lady. Damn!"

(Laughter.) And she brought me in with some light salsa moves.

After all, she's Cuban.

I'm thinking, "Axel, break. Axel, break."

Like you've never thought of that in your life? right? yes.

Park your car and put it in the parking lot.

The engine is still running - it's mine, not the car.

"Don't move!" and jump out next to her.

"I'm not going anywhere."

She sat in the front row of a Greek tragedy.

Esther is there when you go outside.

She is holding her purse.

"Huh?" This means "what" and so on.

(laughter) "Mommy, aren't you ashamed?

People are watching us."

Well, some of that you have to make up for, folks.

trade secrets.

guess what? Some of these stories I sculpt a little here and there.

Some are right there. put it there

she tells me

After I said--let me refresh--"Aren't you ashamed?"

"No, I stopped with pantyhose because they are too restrictive."

(Laughter) (Applause) Yes, you can clap, but we're about 30 seconds away from the end.

Suddenly someone tapped me on the shoulder when I was about to break like a fragile twig.

brave soul.

You think, "This is my child. How can I do that?"

She jumped out of the car. ”

It's okay, I yell at my mom because she yells at me.

It's a beautiful hierarchy and it works.

(laughs) I turn around and I'm not a child. It was a young woman, a little taller than me, pale green, with happy eyes.

With her is a young man - husband, brother, lover, it's not my business.

And she says, "Excuse me, ma'am" - that's how we talk there - "Is that your mother?"

I said, "No, I'm chasing a little old lady in the parking lot to see if they stop. Yes, it's my mother!"

The boy now says: "Well, what she meant"--they looked at each other, it was a knowing look--"Oh my God, she's crazy!"

When I said (in Spanish) the young girl and young boy said, "No, no, honey, we want to know one more thing."

I said, "Look, please let me take care of her, okay, I know her, and believe me, she's like a little nuke, you just want to treat her really carefully."

Then the girl said, "I know, but I mean, I swear to God, she reminds us of our mother."

I almost forget.

He stepped on the heel of his shoe and turned to her.

It was a half whisper, "God, I miss her."

Then they turn shoulder to shoulder and walk away in reverie.

Memories of a crazy woman whose DNA brought her luck.

And I turned to Esther rocking in those harbors and said, "Do you know, honey?"

"What, mother?"

"If you're lucky, it'll probably drive you crazy for another 14 or 15 years. But after that, honey, you'll miss me."

(applause)

What I think about school lunches is that it's a matter of social justice.

I am the Director of Nutrition Services for the Berkeley Unified School District. We have 90 employees, 17 locations and 9,600 children.

I have been eating 7,100 meals a day for two years and am changing the way American children are fed.

That's what I want to talk to you about today.

These are my kids with the salad bar.

When I got there, I installed a salad bar in every school.

Everyone says it couldn't be done.

Little kids can't eat the salad bar and big kids spit on the salad bar, neither happened.

When I took over this, I seriously tried to understand what my vision would be.

How can we really change our children's relationship with food?

I'll tell you why it needs to change, but it absolutely does.

And what I understood is that we need to teach our children the symbiotic relationship between a healthy planet, healthy food, and healthy children.

And the antithesis is that if we don't, we're really going extinct because we're feeding our children to death.

That's my premise.

We see sick children getting sicker and sicker.

And the reason this is happening is largely because of our food system and the way governments commoditize food, the way governments oversee our food, the way the USDA puts unhealthy food on children's plates, and the way unhealthy food is allowed in schools.

And, implicitly, we all tell our children, grandchildren, nieces and nephews to go to school and learn what school is about.

And that's what they learn when you feed these kids bad food. That's exactly what this is all about.

We are here thanks to a large agribusiness.

We now live in a country where most people generally do not decide for themselves what they eat. You can see that big companies such as Monsanto and DuPont have brought orange defoliants and anti-fouling carpets to the world.

They control 90 percent of the seeds commercially produced in our country.

These are 10 companies that control a lot of what's in the grocery store and a lot of what people eat. And it really, really matters.

So when we started thinking about these issues and how we could change what our kids eat, we started to really focus on what we were teaching them.

The first thing I worked on was about local food. That meant trying to eat food within our area.

And obviously, what's going on with fossil fuel use, or when it's going to happen, as fossil fuels run out and oil hits peak oil, we have to start thinking seriously about whether we should or can travel 1,500 miles before eating food.

So we started talking to our kids about it and actually getting them to eat local food.

And talk about organic food.

While most school districts cannot afford organic food today, we as a nation must start thinking about consuming, growing, and feeding our children chemical-free food.

We cannot continue to feed our children with pesticides, herbicides, antibiotics and hormones.

It cannot continue.

It doesn't work.

And as a result, children get sick.

One of my big soapboxes right now is antibiotics.

70% of the antibiotics consumed in the US are consumed in the livestock industry.

We feed our children beef and other animal proteins mixed with antibiotics every day.

70 percent – ​​unbelievable.

And as a result, we get sick.

We have things like E. coli that we can't cure or make our children sick when they get sick.

And yes, antibiotics are over-prescribed, but that's a food supply problem.

One of my favorite facts is that US agriculture uses 1.2 billion pounds of pesticides each year.

That means all of us, and all of our children, will be consuming a 5-pound bag, or the equivalent of a bag at home. If I had it here and ripped it open, it would leave a pile of it on the floor. It's what we consume and feed our children every year because of the way we consume produce in America.

The USDA allows these antibiotics, hormones and pesticides to be used in the food supply, and the USDA paid for this ad in Time magazine.

I can talk to Rachel Carson about DDT, but I know it's not good for you and me.

And that's what the USDA allows in our food supply.

And it has to change.

The USDA cannot be considered final in what we feed our children and what is allowed.

I can't believe they have our interests in mind.

The antithesis to all this is sustainable food.

That's what I'm really trying to get people to understand.

I really try to teach it to my kids. I think that's the most important thing.

It's about consuming food in a way that we try to sustain the planet, allow our children to grow up healthy, and actually mitigate all the negative effects we're seeing.

It's really a new idea.

So people think about sustainability, but we need to understand what sustainability is.

In less than 200 years, in just a few generations, we went from 200 people, 100 percent, 95 percent farmers, to less than 2 percent farmers.

We now live in a country where there are more prisoners than farmers. 2.1 million prisoners and 1.9 million farmers.

And we spend an average of $35,000 a year to keep prisoners in jail, and school districts spend $500 a year to feed our children.

No wonder there are criminals.

(Laughter) And what's happening is we're sick.

We got sick, and so did our children.

That's what we give them.

We are what we put into it.

We really are what we eat.

And if we continue down this path, if we continue to feed our children bad food, and if we don't continue to teach them what good food is, what will happen? Can you see what happens?

What will happen to our entire healthcare system?

What will happen is that we will have children with shorter life spans than we do.

The CDC (Centers for Disease Control) announced that among children born in 2000 (currently ages 7 and 8), 1 in 3 whites and 1 in 2 African Americans and Hispanics will develop diabetes in their lifetime.

If that's not enough, they continue, mostly by high school graduation.

This means that 40-45 percent of all school-aged children could become insulin dependent within 10 years. Within 10 years.

what will happen?

Now, the CDC goes a step further, saying that children born in 2000 could be the first generation in our nation's history to die younger than their parents.

And it's because of what we're giving them.

Because 8-year-olds are indecisive. If you decide, you need to seek treatment.

As you know, we are responsible for what our children eat.

But hey, maybe they're responsible for what they eat.

Large corporations spend $20 billion a year marketing non-nutritional foods to children.

$20 billion a year. Most kids see 10,000 ads.

They spend $500 on every dollar. For every dollar you spend marketing healthy, nutritious foods, you spend $500 marketing foods your kids shouldn't eat.

As a result, children will think they will die if they don't eat chicken nuggets.

You know we all think we should eat more, more, more.

This is the size of a single USDA serving. That little, little thing.

And there, bigger than my head, is what McDonald's and Burger King and those big companies think we should be eating.

And why can they offer so much service?

Why can you eat a 29-cent Big Gulps or a 99-cent Double Burger?

That's because the way governments commoditize food and the cheap corn and cheap soybeans pushing into our food supply make these non-nutritive foods really, really cheap.

That's why I say this is a social justice issue.

Now, when I say we do this at Berkeley, you might be thinking, "Oh, Berkeley, of course Berkeley can do it."

Well this is food I found 24 months ago.

This is not even food.

Here's what we used to feed the kids: Extramo burritos, corn dogs, pizza pockets, grilled cheese sandwiches.

Everything arrived in plastic or cardboard.

The only kitchen tool my staff had was a cutter.

The only equipment I could use in my kitchen was a can crusher. If it wasn't in a can, it would have been frozen in a box.

USDA allows this.

USDA allows all of this.

In case you can't tell the difference, it's like a pink Danish and a cupcake.

Chicken Nuggets, Tater Tots, High Fructose Chocolate Milk, Canned Fruit Cocktail - Refundable Meal.

That's what the government says it's okay to feed our children.

It's not okay you know what? it's not okay.

And we all need to understand that this is our own issue and that we can make a difference here.

Now, I don't know if any of you invented chicken nuggets, but if you did, you would be rich.

But who decided chickens should look like hearts, giraffes and stars?

Well, Tyson did, because chicken has no chicken in it.

And then they figured it out and we knew we could sell this to our kids.

What's wrong with telling kids that chicken looks like chicken?

But this is what most schools offer.

In fact, this may be what we are trying to do, as opposed to what many parents do.

We really need to change this whole paradigm when it comes to kids and food.

We really have to teach our children that chickens are not giraffes.

Vegetables actually have color, they have taste, carrots grow in the soil, strawberries grow in the soil.

No strawberry trees, no carrot bushes.

You know, we have to change the way we teach our kids about these things.

There are many things we can do. There are many schools that run farm-to-school programs. In fact, many schools have introduced perishable foods into their schools.

Now in Berkeley, we feel completely fresh.

No high fructose corn syrup, trans fats or processed foods.

We cook from scratch every day.

Twenty-five percent of our products -- (applause) Thank you -- twenty-five percent of our products are organic and locally grown. we cook

those are my hands I get up at 4:00 am.

Make meals for your children every day. Because this is what we have to do.

We can't continue to feed our children chemical-laden processed waste, and we expect these to become a healthy nation.

Without nourishment for the next generation and the generations after that, this way of thinking will never develop.

Eating chemicals all the time makes it impossible to think.

they won't be smart.

you know what? they just get sick.

Well, what happened when I went to Berkeley, I realized that this was all very surprising to people, that it was something very different, and I had to market it.

I came up with these calendars and sent them out to all parents.

And then these calendars actually started laying out my program.

Currently, I am in charge of all cooking classes and all gardening classes in my district.

So, it is a representative menu.

This is what the school is offering this week.

And can you see these recipes on the side?

These are the recipes that children learn in my cooking class.

The gardening class also offers tastings of these ingredients.

They may also grow. and serve it in the cafeteria.

If children's relationship with food is to change, they need delicious and nutritious meals in cafeterias, hands-on experiences such as cooking and gardening classes, and an academic curriculum that ties it all together.

Now, you probably understand that I don't love the USDA, and I have no idea what to do with the USDA pyramid, this upside-down pyramid with a rainbow on top.

Run up to the end of the rainbow, I don't know what to do with it. So I came up with my own.

This is published on my website in English and Spanish and is a visual way to talk to children about food.

Really small burgers, really big veggies.

We have to start changing this.

We have to make our children understand that food choices make a big difference.

We have a cooking class - our school has a cooking class.

And why this is so important is because we now have a generation, perhaps two generations of children who will eat 1 out of 4 meals at fast food, 1 out of 4 meals in the car, and 1 out of 4 meals in front of the TV or computer.

What are children learning? Where is your family time?

Where is socialization? where is the discussion?

Where is learning to speak?

You know, it has to change.

I often work with children. These are the kids I work with in Harlem.

EATWISE -- Enlightened and conscious teens who encourage smart eating.

We must teach our children that Coke and Pop Tarts are not breakfast.

We have to teach our children that eating a diet of refined sugar will make them gain and lose weight just like eating crack.

And we have to put it all together. All schools compost.

We recycle at all our schools.

What we do at home and think is very important, we have to teach our children at school.

It has to be a part of them so that they can really understand it.

Because many of us are nearing the end of our careers, we need to give these kids, the younger kids, the next generation of kids, the tools to save themselves and the planet.

One of the things I do a lot is public-private partnerships.

I work with private companies that are ambitious in research and development. Someone who distributes with me, someone who is really willing to work so that I can go to school.

Schools are underfunded.

Most schools in America spend less than $7,500 a year on educating children.

That's less than $5 an hour.

Most people spend $10-15 an hour to hire a babysitter.

So we spend less than $5 an hour on our education system.

And if we're going to change that and change the way we feed our kids, we really need to rethink that.

This means working with public-private partnerships, advocacy groups and foundations.

Our school district allocates 0.03 percent of the General Fund to nutrition services as a way to fund this. And I think once every school district allocates 0.5 percent to 1 percent, we can start to really fix this program.

We really need to change that.

It costs more.

Of course, food isn't everything. It is also for children to exercise.

One simple thing we can do is have a break before lunch.

It's a kind of "normal" thing.

You know, if the kids were at lunch, and when they got out of lunch they were just going to go to recess, they would throw their lunch away so they could run outside.

Then, at 1:00 PM, it completely collapses.

Your children and grandchildren who are completely melted when you pick them up because they haven't eaten lunch.

I mean, if the only thing they had to do after lunch was go to class, believe me, they would sit there and eat lunch.

we need to educate.

we need to educate our children.

We need to educate our staff.

The number of employees was 90.

Two were supposed to be chefs, but none of them became chefs.

And you know, I'm not so good right now.

But we really have to educate.

We have to get academic institutions to start thinking about how to teach people how to cook again. Of course they don't. Because we've been eating this processed food in schools and educational institutions for a long time.

We need a 40 minute lunch (most schools have a 20 minute lunch) and we need a timed lunch.

Extensive research has just been done and many schools are starting lunch at 9 and 10 in the morning.

It's not lunch break.

I get it, it's crazy. What we do is crazy.

And remember, at least implicitly, this is what we teach our children to do.

If we want to solve this problem, I think one of the things we have to do is make a big change in how we monitor the national school feeding program.

I think the National School Lunch Program should be under CDC, not USDA.

If we started thinking about food and how we feed our children as a health initiative, and started thinking about food as healthy, I think we would stop eating corn dogs for lunch.

Well, finance number 101, this and that -- I think this is something we all need to understand, so I'm going to wrap up with this finance article.

The National School Feeding Program provides $8 billion annually to 30 million children.

That number should probably double.

People say, "Oh my God, where did you get eight billion?"

The country spends $110 billion annually on fast food.

We spend $100 billion a year on dietary supplements.