This is from a paper by Bill Buttow, a student now at Intel, who wondered why not just make smaller chips, put them in a viscous medium, and pour out computing by the pound or by the square inch, instead of making bigger and bigger chips.

And that's what you see here.

On the left is PostScript rendered by a conventional computer. On the right is a postscript rendered from the first prototype we made, without any framebuffers or IO processors or anything like that, just this material.

Unlike this screen where the dots are carefully placed, this is raw material.

Adding 2x will double the display.

Shooting in the middle does nothing.

If you need more resources, just add more computers.

This is the next step, computing as raw material.

This is still the conventional bit and the steps after that are: This is an early prototype in the lab. This is a slow slowed down video.

Now, integrate chemistry into the computation. Bits are foam.

This shows the creation of bits. This is again slowed down so you can see the bits interacting to do the logic and multiplexing and demultiplexing.

Therefore, it can now be calculated that the output contains not only information, but also material. And finally, these are the slides from an early project I did. By calculating where the bits are quantum mechanically stored in the nucleus, the program rearranges the nuclear structure of the molecule.

All of these have been advanced further in the lab, integrating bits and atoms literally, not as metaphors, leading to the following realizations.

We all know the digital revolution has happened, but what is it?

Well, Shannon took us from here to here in the 40's. The phone was the distance to the Internet from speaker wire that degrades with distance. And he proved the first threshold theorem, showing that imperfect devices can be perfectly computed by adding or removing information from the signal.

And then we got the internet.

Von Neumann did the same thing with computing in the 50's. He showed that even an unreliable computer can be restored to its perfect state. It was the last good analog computer at MIT, a difference analyzer, but the more I ran it, the worse the answer got.

After von Neumann was the Pentium, and the billionth transistor is just as reliable as the first.

But all our productions are in this bottom left corner.

State-of-the-art airplane factories spin metal wax against fixed metal. Or maybe you're melting plastic. The $10 billion chip factory uses a process that any village craftsman would understand: spread and bake ingredients.

All intelligence is outside the system. There is no information in the documentation.

Yesterday I heard about molecular biology, which is basically compute and build.

Information processing system.

We have had a digital revolution in communication and computing, but the exact same ideas, the exact same mathematics that Shannon and von Neumann did, have yet to appear in the physical world. So my colleagues in this program, the Bit and Atom Center at MIT, were inspired by a group of people who, like me, never understood the boundaries between physical and computer science. I'd go even further and say that computer science is one of the worst things that ever happened to computers and science -- (laughter) -- computer science the norm -- many of them are good, but the computer science norms prematurely frozen computational models based on technologies that were available in 1950. Nature is a much more powerful computer than that.

Well then, tomorrow we'll hear from Saul Griffiths. He was one of the first students to come out of this program.

We started thinking about how it could be calculated and manufactured.

This is just a proof-of-principle he did for magnetically interacting tiles, and you can write code to specify their structure, much like protein folding.

Therefore, there is no feedback to tool metrology. The material itself encodes its structure in exactly the same way proteins are manufactured. For example, you can do:

You can also do other things. It's 2D. Works in 3D.

The video on the top right, which I won't show due to time constraints, shows self-replication, creating templates so that something can make something, and it's doing it now, probably on a scale of nine orders of magnitude or more. These ideas have been used to demonstrate the highest fidelity and direct rate of DNA for making organisms in functionalizing nanoclusters with peptide tails that encode assemblies. So much like magnets, but now on the nanometer scale.

Laser Micromachining: Basically, a 3D printer that digitally manufactures functional systems leading up to the construction of a building, using the part codes of the building structure rather than blueprints.

So these are early examples in the lab of emerging technologies to digitize manufacturing. Not the computer that controls the tool, but the computer that is the tool whose program output rearranges not only bits but also atoms.

Well, that's why -- thank you, with your tax dollars -- I bought all of these machines. We made a modest proposal to the NSF. Digital fabrication cannot be separated by specialties or length scales, so we wanted to be able to create everything in one place for all length scales.

Therefore, we combined a focused nanobeam writer, a supersonic water jet cutter, and an excimer micromachining system.

However, there was a problem. After getting all these machines, I spent far too much time teaching my students how to use them.

So I started teaching a class modestly named "How to Build Almost Anything." It wasn't meant to be provocative. It was for just a few graduate students.

However, the first day of classes was like this.

Hundreds of people came begging. I have been waiting for this class since I was born. I will do anything for that.

Then they ask, "Can you teach that at MIT?" Too convenient, don't you think?

And then -- (laughter) -- the amazing thing was that they weren't there to do research.

They were there because they wanted to create something.

They had no traditional technical background.

At the end of the semester, they consolidated their skills.

I'll show you an old video. Kelly is a sculptor and this is what she did for a semester project.

(Video): Kelly: Hello, I'm Kelly. This is my scream buddy.

Have you ever been in a situation where you couldn't or weren't allowed to do so because you were at work, in class, or watching the kids when you really should?

Yes, Scream buddy is a mobile scream space.

When a user shouts at a Scream Buddy, the screams are silenced.

Also, where, when, and how the user chooses are recorded for later releases.

(shouting) (laughter) (applause) Then Einstein would want this too.

This student created a web browser for parrots. Allows parrots to surf the web and talk to other parrots.

This student made an alarm clock. Wrestle to prove it's happening. This is a protective dress, a dress that protects your personal space.

This is not technology for communication. technology to prevent it.

This is a device that allows you to check your music.

This is a student who built a machine that builds a machine and builds it out of Lego blocks that do computing.

Year after year, I finally realized that it was the killer home-made apps that my students showed me that were for one market.

You don't need this for anything you can buy at Walmart. You need this to make you unique.

Ken Olsen famously said, "No one needs a computer in their home."

However, it is not used for inventory or payroll. DEC has now gone bankrupt twice. You can buy what you can afford, so you don't have to make it yourself at home.

Just like personalization, it is necessary to make you unique.

So now this is what we're going to do with $20 million today. Twenty years from now we will be building a Star Trek replicator that will build anything.

The students hijacked all the machines I bought for personal use.

Today, when you spend that much money, you are mandated by the government to do outreach. This is often not as glamorous as a class at a local school or a website.

So I made a deal with the NSF program manager to give me the tools in exchange for talking about it.

This isn't meant to be provocative or critical, but we've put together these fab labs. A rough estimate of what $20 million will do and where it will go is equivalent to about $20,000 in equipment.

Laser cutters for 2D to 3D press-fit assembly, sine cutters for copper plotting for electromagnetism, micron-scale numerically controlled milling machines for precision structures, sub-dollar programming tools, and 100-nanosecond microcontrollers. It became possible to work in microns and microseconds, and it spread explosively all over the world.

This was not planned, but they traveled from downtown Boston to Poval, India, to Sekondi-Takoradi on the coast of Ghana, to the town of Soshangve, South Africa, to the Far North of Norway, all finding or helping to find unused computers despite the focus on the digital divide.

A farmer in a rural village. Children need to measure and change the world, not just get information about the world on the screen.

In fact, the gap between the manufacturing sector and the measurement sector is greater than the digital gap.

And the way to solve it is IT development for the masses, not IT for the masses.

So, one after another, we saw similar developments. That means opening one of the fab labs that we didn't open. This is unthinkably crazy.

We never thought we would be drawn to a place like this. we open it The first step was just authorization.

All you can see on their faces is this joy of 'I can do it'.

This is a girl in downtown Boston who just ran a high-tech on-demand handicrafts sale at a downtown community center.

From there, formal, hands-on technical education takes place informally outside the school. Ghana has established one of these laboratories.

We designed a network sensor and kids would show up and wouldn't leave the lab.

There was a girl who insisted on staying up late -- (video): Kids: I love fab labs.

-- The first night in the lab to build the sensor.

So she persisted in learning how to make and pack boards and learn how to program them. She didn't really know what she was doing or why she was doing it, but she just knew it had to be done. There was something electrical there.

It was late at 11pm, and I think I was the only one who was surprised when her creation worked for the first time.

I've shown this to engineers at big companies and they say you can't do that. If it's one thing she does, it could be done better, but it's spread across many people and many sites and you can't do what this girl in rural Ghana is doing overnight.

(Video): Girl: My name is Valentina Kofi. i am 8 years old

I made a stacking board.

And, again, it was just for pleasure.

These laboratories then set out to solve serious problems such as agricultural instruments in India, steam turbines for energy conversion in Ghana, and high-gain antennas for thin client computers.

And in turn, the business of making these antennas and so on began to grow.

And finally, the lab started inventing.

We learn from them more than we give them.

I was teaching children how to use it at the fab lab.

They invented a way to build kits out of cardboard boxes. As you can see, this is becoming a business. But their design was better than MIT's sole design. So at MIT, three students are currently writing a paper on expanding jobs for eight-year-olds. Because they had better designs.

The real inventions are made in these labs.

And I still continue to do that -- so last year I've spent time with heads of state, generals, tribal chiefs, and they all want this, and I keep saying, this isn't real.

Wait 20 years and you're done.

And then I finally understood what was going on. This is Kernigan and Ritchie, the inventors of UNIX on the PDP.

PDPs appeared between mainframes and minicomputers.

They cost tens of thousands of dollars and were hard to use, but they brought computing down to workgroups, where everything we do today is done.

These fab labs come with the cost and complexity of PDP.

Predicting digital fabrication is not predicting the future. Now is the age of PDP.

We then whispered about a great discovery.

It was very chaotic and I didn't really understand what was going on.

In the same vein, we are today in the mini-computer age of digital fabrication.

The only problem is that it breaks everyone's boundaries.

In Washington DC, go to any agency you want to talk to. In the Bay Area, I go to every organization I can think of. Every organization wants to talk about it, but it breaks organizational boundaries. In fact, in many cases it is illegal for them to allow ordinary people to create technology rather than consume it.

And the problem is so serious that I was amazed at the ultimate invention that came out of this community. It's social engineering. The lab in the far north of Norway is so far north that the satellite dish points at the ground instead of the sky. Because there are satellites there. The lab has grown beyond the small barn it used to be.

They wanted to find animals in the mountains so they were there, but there were too many animals, so they built this wonderful village for their laboratory.

This is not university. it's not a company. This is essentially a village for inventions. It's a village of social outcasts, who have grown up around fab labs all over the world.

As such, the program was split into an NGO Foundation, a Fab Foundation to help scale up, and a micro VC fund.

The people who run it aptly put it like this: "A machine that makes machines needs a company that makes businesses." It combines microfinance and venture capital to fan out, and it's a research partnership with MIT that makes it possible.

So I would like to leave you with two thoughts.

From top-down megaprojects to bottom-up grassroots to root-investing microfinance, everyone understands that big changes in aid can and do work.

But we still see technology as a top-down mega-project.

Computing, communications, and energy for the rest of the planet are these top-down megaprojects.

If this room full of heroes is smart enough, the problem will be solved.

The message from Fab Labs is that the other 5 billion people on Earth are more than just technological think tanks. they are sources of information.

The real opportunity is to harness global ingenuity to locally design and produce solutions to local problems.

I thought it was a prediction for the future 20 years from now, but that's where we are today.

It breaks down every organizational boundary we can think of.

The hardest right now is social engineering and organizational engineering, and today it's here.

And finally, any talk like this about the future of computing needs to point to Moore's Law, but my favorite version -- this is the original version from Gordon Moore's original paper -- and what's going on is, year after year we scale, scale, scale, scale, scale, scale, scale, scale, scale, and what's to come, there's an impending bug. It happens at the end of Moore's Law. Here comes the ultimate bug.

But we have come to understand that moving from 2D to 3D, from programming bits to programming atoms, changes the endpoint of Moore's Law, which extends from ultimate bug to ultimate feature.

So we are at the leading edge of this digital revolution in manufacturing. There, the output of computations programs the physical world.

So combining these two projects can answer a question I hadn't carefully asked. My MIT classes taught me that the killer app for personal fabrication in the developed world is a technology for one market: a personal expression in technology that touches my passions, unlike anything I've seen in the tech world.

And the killer app for the rest of the planet is the disconnect between equipment and manufacturing. That is, people who locally develop solutions to local problems. thank you.

Today, I am very honored to share with you a digital universe created to help us really know where humanity is in the universe.

So I think we can publish the video that we have.

[HIMALAYAS] (music) The flat horizon we have evolved is a metaphor for infinity. Infinite resources and infinite waste disposal capacity.

It wasn't until we actually left the Earth, reached the upper atmosphere, and saw the horizon warped, that we could understand the limited state of the Earth.

The Digital Universe Atlas has been built over the past 12 years at the American Museum of Natural History.

We keep it and put it together as a project to really graph the universe on all scales.

What we see here is the satellites around the Earth as we see them, and the Earth properly aligned to space.

NASA supported this work 12 years ago as part of the reconstruction of the Hayden Planetarium to share it with the world.

The Digital Universe is the foundation of the space show production we do, the main space show in the dome.

But what you see here is actually the result of an internship organized by us and Linköping University in Sweden.

I had 12 students work on this as their senior thesis, and the result was this software called Uniview and a Swedish company called SCISS.

The software allows for interactive use, so the actual flight paths and movies you see here were actually flown live.

This was captured live from my laptop at a cafe called Earth Matters in Manhattan's Lower East Side, where I live, as a joint project with the Rubin Himalayan Museum for an exhibition on comparative cosmology.

And as we go out, it continues to be visible all the way from our planet to the galactic realm, as seen here, giving us a sense of how far we are in the travel time of light.

When we go outside, the light from these distant galaxies takes a very long time to reach us, and we are essentially back in the past.

We receded far into the distance until we finally contained it around and saw the afterglow of the Big Bang.

This is a WMAP microwave background.

I fly out of here just to see this kind of containment.

If we were out of this, it would be all but meaningless, in the same sense as before.

But this is the containment of our visible universe.

We know the universe is bigger than what we see.

Quickly back, here you can see the radiosphere we first popped out of, but these are the locations, the latest locations of the exoplanets we have mapped, and our sun here, apparently our own solar system.

What you'll see -- you'll have to dive fairly quickly between orders of magnitude to get to where the solar system is visible -- these are the paths of the first four spacecraft to leave the solar system: Voyager 1, Voyager 2, Pioneer 11, and Pioneer 10.

If you get closer and pick up the orbits of the Earth and the Moon, you can see the Earth.

This map can be updated and new data can be added.

I know Dr. Carolyn Poco is a photographer.

For the Cassini mission.

But here we see the complex trajectory of the Cassini mission, color-coded into different mission phases. It was engineered to change orbit during different parts of the mission phase with 45 encounters with Titan, the largest moon larger than Mercury.

This software allows you to get a closer look at some of this.

The software can also be networked between domes.

We are growing the user base of this and networking the dome.

You can also network between domes and classrooms.

We actually share a space tour, including Ghana's first sub-Saharan planetarium, a new library built in a Colombian ghetto, and a Cambodian high school.

And the Cambodian actually ran the Hayden Planetarium since high school.

This is an image from Saturday, taken by the Aqua satellite, but through Uniview software.

In other words, you can see the edge of the earth.

This is Nepal.

Actually, this is the Lhasa Valley in Tibet.

However, in India's Ganges valley below, you can see the haze caused by fires.

This is Nepal and Tibet.

And finally, I would like to say about this beautiful world in which we live. We're seeing a little bit of snow here that some might have dared to step outside, but I'd say what the world needs now is a sense of being able to see itself in this much larger state now, and a greater sense of what home is.

Because our home is the universe and we are essentially the universe.

we carry it within ourselves.

And I think being able to see our situation in this larger sense at every scale helps us all understand where we are and who we are in the universe.

thank you.

(applause)

why build a house Because we can.

America is currently in a state of constant trauma.

There's a reason for that.

There are Mac People, Mac Cars, and Mac Houses.

As an architect, I have to face things like this.

So what is the technology that makes it possible to build giant houses?

Well, it's been going on for 2500 years.

This is called peaching, or grafting the tree, or grafting the joint material into one continuous vascular system.

And we do things differently than we have done in the past. Add a little intelligence to it.

We use CNC to build scaffolds, train semi-epicethic substances, plants, into specific shapes, and build homes called fab tree hubs.

fit in the environment. It's the environment.

It's a landscape, right?

You can have hundreds of millions of these homes and it's great because they suck up the carbon dioxide.

they're perfect

You can have 100 million families or take stuff out of the suburbs. Because the home is part of the environment.

Imagine a village pre-grown. This will take about 7-10 years. Then everything will be green.

So, not only are we building a vegetable house, but we're also building an ex-corporeal meat habitat, a house that we're currently doing research in Brooklyn. For the first time as an architectural firm, we have set up a laboratory for molecular and cellular biology, have started experiments in regenerative medicine and tissue engineering, and are beginning to think about what the future will look like when architecture and biology are united.

We've been doing this for several years, that's our lab.

And what we're doing is growing extracellular matrix from pigs.

Print the geometry using a modified inkjet printer.

We print geometries that can create industrial design objects such as shoes, leather belts, and handbags to keep sentient beings from being harmed.

No victims. Meat out of a test tube.

So our theory is that eventually we should do this at home as well.

This is a typical stud wall, architectural structure and this is part of our proposal for a meat house. You'll find it uses fat cells as insulation, cilia to deal with wind loads, and the sphincters of doors and windows.

(Laughter) And we know it's incredibly ugly.

An English Tudor style or a Spanish Colonial style would have been fine, but we chose this style.

And there, at least that particular section is kind of growing.

We had a big show in Prague, but decided to do it in front of the cathedral so that religion could face off against the House of the Flesh.

That's why we grow homes. Thank you very much.

(applause)

Who will be fascinated by the creatures under the sea here?

wonderful.

So what have we done now?

Let's look at this in a little more detail.

The simple action of one person raising his hand has led many others to do the same.

Indeed, when individuals within a social network have common priorities, it is often beneficial to imitate each other.

Remember when you were in elementary school? Dressing like cool kids made you "cool."

However, copy behavior is also common in wild animals.

For example, some birds copy the alarm sounds of other birds to disseminate information about approaching predators.

But could mimicking the behavior of wildlife affect entire ecosystems on which we humans depend?

I came to this question while researching coral reefs that support millions of people through fishing and tourism here in Africa and around the world.

However, coral reefs rely on fish that play an important role by feeding on algae.

Because if left unchecked, these algae can kill corals and take over entire reefs, a change that is difficult or impossible to reverse and is costly.

So, to understand how the fish prevent this, I scouted them when they were feeding on the algae, but it can be difficult for them to do so in the open areas of the reef where they are exposed to predators, and on rare occasions some fish have noticed that I am observing them.

(Laughter) Obviously, obviously, eating out is scary for reef fish.

But I wanted to understand how these fish do their job in dangerous situations.

So a colleague and I set up a giant video camera stand on the reef to remotely monitor the entire feeding ground, which produces large amounts of algae but is also exposed to predators.

And this top view shows the feeding behavior and precise movements of different fish, indicated by the colored dots.

By analyzing the movement of thousands of fish in and out of feeding grounds, they discovered a pattern.

These fish mimic each other, even though they are different species and do not swim in groups, and when one fish enters these dangerous feeding grounds, many others may do the same.

And when surrounded by more feeding fish, they stayed longer and ate more algae.

Now, it's possible that this is happening because even simple movements of individual fish can misrepresent important information.

For example, if a single fish finds a predator and escapes, it can warn many other fish of danger.

And you can show others that the shore is clean by allowing the fish to safely enter the feeding grounds.

So, even though these fish are different species, they are connected within a social network that can provide information about when it is safe to eat.

And our analysis shows that fish that simply copy other fish within social networks may account for over 60 percent of the algae eaten by fish communities and thus may be important for energy and resource flows through coral reef ecosystems.

But these findings also suggest that overfishing, a common problem on coral reefs, not only robs fish, but can also disrupt social networks of remaining fish, hiding more fish and reducing the amount of algae they eat, lacking critical information.

And this will make coral reefs more vulnerable than currently expected.

Amazingly, the social network of fish means that the actions of one person can spread to many, feeding millions of us and impacting entire coral reefs that underpin the global economy for all of us.

Now, our findings show us how to better manage coral reefs sustainably, but they also show that we humans are not only influenced by the behavior of other humans, but we can be influenced by that behavior through the simple mimicking behavior of individual fish on distant reefs.

thank you.

(applause)

In 1969, New York City, during a third-grade music class, our teacher took us into a room with nothing but a piano and a chair.

And then he called us one by one and asked us to play middle C and sing it.

(singing) You will then be directed to go to the right or left side of the room.

(Laughter) And when all 35 kids were done, the left side of the room I was in was told to get up and go back to the homeroom.

(Laughter) And no one took music class again in elementary school.

In-clubs and out-clubs were established, and I didn't even know what a gate test was at the time.

A few years later, an English class...

(Laughter) I got my first paper of the new semester, and it was in C+, with the comment, "It was what I expected."

(Laughter) To be honest, I didn't care about C+.

I'm glad it wasn't C or D.

But the comment "good as expected"...

Even at such a young age, it didn't seem right.

It seemed somehow limited.

Now, how many people have had similar experiences at school or work?

we are not alone.

So maybe it's ironic that my path in life led to a career in making and writing music with the Blue Man Group (laughs) and starting school.

(laughs) But school was torture for me.

Originally, I had no interest in learning, so the teachers never seemed to understand me.

So I started to wonder why, if even then, these environments didn't know how to treat people who didn't fit the norm, why didn't they reframe the environment to play to people's strengths?

I have come to believe that safe and beneficial conditions must be cultivated for new and innovative ideas to evolve and thrive.

We know that humans are inherently innovative. Because otherwise, we would all be using the same arrowheads we used 10,000 years ago.

So one of the questions I asked was, is there an easier, more frequent way to innovate?

Are there breakthrough moments that seem random and occasional, or a way to deliberately make them happen more often?

When we started The Blue Man Group in 1988, we had never done an Off-Broadway show before.

In fact, we had very little theater experience.

But we knew what we were passionate about, and it was a series of things we hadn't seen on stage before, like art, pop culture, technology, sociology, anthropology, percussion, comedy, and following your bliss.

We wanted to establish a rule that nothing could be staged that had been seen before, and to inspire creativity and connection between ourselves and the audience. We wanted to do something good for society, and we wanted to enjoy it.

And in the office, we wanted to create an environment where people could treat each other a little better and treat each other with a little more respect and consideration than they would in the outside world.

And iteratively and collaboratively, we found solutions to create something never seen before.

Over time, I've learned that the best conditions for this kind of creative and innovative environment are clear intentions, purpose and passion. This is about working on something bigger than ourselves.

Personal Integrity: Do what you set out to do.

It's about being who we really are in every interaction.

Direct communication and clear expectations, even if the subject matter is difficult.

Guts and Perseverance: Repeat, repeat, repeat.

Establish a supportive team.

Instills deep trust and mutual respect.

Everyone on the team is on board.

No out clubs.

We rise as a team and fall as a team. A decision is a decision until it is no longer.

Incorporate multiple perspectives.

This means that all voices matter and all emotions matter.

Address disagreements head-on.

People need to feel seen and heard.

Take risks and celebrate your mistakes.

A commitment to being a learning organization, always looking to innovate and push the learning curve upwards.

and speak in unison.

This is perhaps the glue that holds all these conditions together.

The concept is to talk about people who are not there in exactly the same way as if they were there.

This seems like a basic thing, but it's an aspirational practice that can help you deal with difficult situations more respectfully.

Incorporating this practice can go a long way toward raising standards, increasing mutual respect and trust, reducing gossip and political talk in offices and classrooms, and reducing the noise that gets in the way of innovative processes.

At Blue Man Group, iteration was integral to the creative process.

We were trying to explain the consumption and disposal loop in a way that was interesting, creative, and surprising to our audience.

Well, if you are thinking of doing the same effort, I can save you a lot of time here and now.

What I can say for certain is that oatmeal, jello, wheat cream, calyx, pudding, clay, tapioca, silly putty, and tomato paste don't slide down the tube wrapped around the costume, which is supposed to come out of the chest hole and squirt into the audience.

It won't happen.

(Laughter) After months of iterations, we finally settled on bananas.

(Laughter) Who would have expected a banana to have just the right properties of staying firm when forced air is forced into a tube, yet slippery enough to get the dramatic oozing effect we were looking for.

(Laughs) This work has become a symbol of the Blue Man Show.

But that doesn't mean he completely threw away all the rules of theater.

I had a set design. I did the lighting design.

The stage manager was calling the show.

But we believe it was one of the first shows to respectfully connect with an audience by hanging them upside down, (lol) dipping them in paint, slamming them into a canvas, (lol) putting their heads in 70-pound jelly. And made them one of the heroes of the show.

(Laughter) On top of that, we didn't reinvent anything that didn't need to be reinvented.

(Laughter.) Years later, we took all this learning and created a school. It was a school for the kids we wanted to go to, a school where what happened in the hallway between classes was as important as what happened in the classroom. A place where you can take music classes even if you can't sing medium C.

At Blue School, teachers, parents and students are equal collaborators at the table, deliberately creating a safe space where they can develop a lifelong, fun passion for learning.

Again, I wouldn't try to reinvent the wheel if I didn't have to.

We do not hesitate to use more traditional methods such as direct instruction when that is the best method for the lesson.

However, we balance with an integrative approach to learning across all subjects, and balance is key.

In fact, the Blue School was founded on the foundation of academic mastery, creative thinking, and balancing self and social intelligence.

I know this may sound like common sense, but in some circles this is radical.

(laughter) And these qualities have made the Blue School a lot of attention as a truly innovative school.

Nearly a decade later, we announced our middle school expansion.

Our faculty has asked sixth graders to participate in the development of middle school values.

Their process began with the question, "What do we need from our community to be happy and productive at school?"

The students went through a six-week process of individual, collaborative, refinement, and consensus, and the list they came up with was truly extraordinary.

Engage with each other and be present.

Respect and support what others need to learn.

Embrace our diversity—the way we see, think, and act.

Cultivate the practice of self-awareness and awareness of others.

Be respectful and make time for fun and joy.

And challenge yourself, practice being okay, make mistakes, get over them and support each other.

Remember, these kids were 11 when they came up with this.

They articulated what took us 20 years to identify.

One of the big by-products of building these vibrant communities is that we attract people who want to prioritize these values.

They want it above money, prestige, and tradition.

We can all walk this path together in our own companies, our communities, our families, with our values.

For us, and for me, it was important to prioritize children's voices in order to give them the tools to build a harmonious and sustainable world.

Join us on this exciting, passionate and fun journey.

And when we expect to be able to change the world by rebuilding our environment, the good things we can expect are endless.

thank you.

(applause)

thank you very much.

Excuse me for sitting there. I am very old.

(Laughter) Now, the subject I'm about to discuss is very old, so in some ways it's very special.

Roughness has forever been a part of human life, and ancient writers have written about it.

It seemed so out of control, in a way, the height of complexity, just chaos, chaos, and chaos.

There are many different kinds of confusion.

Now, as a matter of fact, by sheer fluke, many years ago I took part in the study of this complex form, and to my complete surprise I found in its roughness a trace—a very strong one, I must say—of order.

So today I want to give you some examples of what this means.

I prefer the word "roughness" to the word "irregularity". Because for those who studied Latin in their youth, "irregularity" means the opposite of regularity.

But it's not.

Regularity is the opposite of roughness, because fundamental aspects of the world are so rough.

Now let's introduce some objects.

Some of them are artificial.

Others of them are very real in a way.

This is the real deal. It's cauliflower.

Now, why am I introducing you to a very common and ancient vegetable called cauliflower?

Because it may be old and old, but it is very complicated and very simple at the same time.

If you try to weigh it, of course it is very easy to weigh it, and weight is important when you eat it, but if you try to measure its surface.

Well, it's very interesting.

If you cut one of the cauliflower florets with a sharp knife and look at it individually, you might think of a whole cauliflower, but it's smaller.

And cut it again, again, again, again, again, again, again, again and still get a little cauliflower.

Therefore, in human experience, it has always been that there are some forms that have this special property of each part being similar to the whole but being smaller.

So what did mankind do with it?

Very, very few.

(Laughter) So when I actually researched this problem, I found something very surprising.

Roughness can be measured by numbers of 2.3, 1.2 and sometimes higher.

One day a friend brought me a picture to pester me and said, "What is the roughness of this curve?"

I said, "Well, 1.5 is a bit short."

was 1.48.

Well, it didn't take long.

I have seen these things for a long time.

These numbers are therefore a measure of the roughness of these surfaces.

Let me quickly say that these surfaces are completely artificial.

These are done on a computer, the only input is a number, and that number is the roughness.

For the left side, I adopted the roughness copied from many landscapes.

On the right side we took higher roughness.

So after a while your eye will be able to distinguish between these two very well.

Mankind had to learn about measuring roughness.

This is very rough, this is kind of smooth, this is perfectly smooth.

Very few are very smooth.

So let's ask, "What is the surface of cauliflower?"

Well, measure and measure and measure.

Each time it gets closer, it grows to a very small distance.

How long are the shorelines of these lakes?

The closer you measure, the longer the length.

The concept of coastline length seems very natural as it is given in many cases, but in fact it is completely false. That's not true.

You have to do it differently.

What is the use of knowing these things?

Well, surprisingly, it excels in many ways.

First, artificial landscapes like the one I invented are used all the time in movies.

You can see mountains in the distance.

They may be mountains, but they may also be just formulas that are just made up.

It's so easy now.

It used to take a lot of time, but now it's nothing.

Come on, look at it. It's real lungs.

Well, lungs are a very strange thing.

When you pick this up, you can see that the weight is very light.

Lung volume is very small, but what about lung area?

Anatomists were arguing about it.

Some say that normal male lungs have an area inside a basketball [court].

And others say, no, we have five basketball [courts].

big disagreement.

Why? Because, in reality, the lung region is very vague.

The bronchial tubes branch, branch, and stop branching for a physical reason, not a principle, but the mucus in the lungs.

That is, they have much larger lungs in some ways, but they branch out about the same distance as whales, humans, and small rodents.

Now, what's the use of having it?

Well, surprisingly, surprisingly, until recently, anatomists knew very little about the structure of the lung.

And, amazingly, I think my mathematics has been very useful to surgeons who study pulmonary diseases and kidney diseases, all these bifurcated systems where geometry does not exist.

That is, I found myself constructing geometry—the geometry of things that do not have geometry.

And the amazing thing is that very often the rule of this geometry is very short.

I have such a long formula.

And crank several times.

Sometimes, repeat, again, again, same repeat.

And finally you can get something like that.

This cloud is completely, 100% artificial.

Well, 99.9.

And the only part that is natural is a number taken from nature: cloud roughness.

Something so complex, so volatile, so changeable, like clouds, should have simple rules behind it.

Now, this simple rule does not explain clouds.

The cloud seer had to take that into account.

I'm not sure how advanced these pictures are. they are old

I was heavily involved in it, but then turned my attention to other phenomena.

Now, here's another interesting thing.

One of the shocking events in the history of mathematics that many people do not understand happened about 130, 145 years ago.

Mathematicians began to create shapes that did not exist.

Mathematicians congratulated themselves, quite astonishingly, that man could invent things that nature did not know.

In particular, you might be able to invent things like curves that fill planes.

A curve is a curve, a plane is a plane, and the two are never mixed.

Well they mix.

Someone named Peano defined such a curve and it was a very interesting subject.

It was very important, but on the one hand it was very interesting because it was a kind of separation, a separation, between the mathematics that comes from reality and the new mathematics that comes from the pure human mind.

Now, it was a great pity to point out that the pure human mind has, in fact, at last seen what has been seen for so long.

So here we introduce a series of rivers of plane filling curves.

And well, it's a story in itself.

So it was from 1875 to 1925, an extraordinary time when mathematics was poised to break out of the world.

And I have completely reversed the objects, those objects, that were used when I was a child and student as an example of the disconnect between mathematics and visible reality.

I have used these to illustrate some aspects of nature's complexity.

Well, in 1919 someone named Hausdorff introduced numbers, a mathematical joke. And I've found this number to be a good measure of roughness.

When I first mentioned this to my math friends, they said, "Don't be silly, it's just [silly]."

Well, actually, I wasn't stupid.

The great painter Hokusai was well aware of this.

Algae is what is on the ground.

He didn't know math. it didn't exist yet.

And he was a Japanese who had no contact with the West.

But painting has long had a fractal side.

We could talk about it for a long time.

The Eiffel Tower has a fractal aspect.

I read the book Mr. Eiffel wrote about his tower and was certainly amazed at how much he understood.

This is confusion, confusion, confusion, brown loop.

One day, I was mid-career and stuck in a lot of things at work, so I decided to give it a try myself.

Can we look at what everyone has been eyeing for a long time and find something dramatically new?

Well, I've looked into these things called Brownian motions - they just go full circle.

I played for a while and returned to the origin.

Then I said to my assistant, "I can't see anything. Can you draw it for me?"

So he painted it, which means he put everything inside. He said: "Well, this came out..." and I said, "Stop! Stop! Stop!"

Oh yeah; it's an island. ”

And wow.

Therefore, Brownian motion, which happens to have a roughness number of 2, orbits.

I measured it and it was 1.33.

again, again, again.

Long measurement, large Brownian motion, 1.33.

Math Problem: How to Prove It?

It took my friend 20 years.

Three of them had incomplete proofs.

They got together and got the evidence together.

So they got a big [Fields] medal in mathematics. This is one of the three medals people have received for proving what I couldn't prove.

Everyone now asks me once, "How did it all begin?"

What got you into that strange business? ”

Why did you become a mechanical engineer, a geographer, a mathematician and a physicist at the same time?

Well, actually, strangely enough, I started studying stock market prices.

So I came up with this theory and wrote a book about it - increasing financial prices.

The left side shows data over time.

At the top on the right you will see a very fashionable theory.

It's so easy, and many books could be written about it in no time.

(Laughter.) There are thousands of books about it.

Then compare it with the actual price increment.

Where is the real price increase?

Well, those other lines include the actual price increase and the counterfeiting that I did.

So the idea there was that one should be able to -- what do you say? -- model price movements.

And 50 years ago it worked.

For 50 years, people have been kind of like pooches to me because it's a lot easier for them to do it.

But at this point, people listened to me.

(Laughter) These two curves are averages. standard and average. Poor blue guy. Red is the standard; the five largest discontinuities are taken from Poor's.

Discontinuities are now a nuisance and are therefore set aside in many studies of prices.

"Well, it's God's work.

And a little nonsense remains.

act of God. ” In this painting, the five acts of God are as important as all others.

In other words, it is not an act of God that we should put aside.

That's the meat, that's the problem.

If you master these, you can master the price, and if you can't master these, you can master as little noise as possible, but it doesn't matter.

Well, here is that curve.

Now, the final step is the set with my name on it.

In a way, this is the story of my life.

My youth was under German occupation of France.

I was dreaming so big because I thought it might be gone within a day or a week.

After the war, I met my uncle again.

My uncle was a very eminent mathematician and said, 'Look, there's a problem I couldn't solve 25 years ago, and no one else can.

This is the work of a man named [Gaston] Julia and [Pierre] Fatou.

If you can find something new, you can build a career, whatever. ”

It's very simple.

So I searched too, but like thousands of people I've tried before, I didn't find anything.

But then computers came along and I decided to apply them to old problems in mathematics instead of new ones.

Then, we moved from so-called real numbers, which are points on a straight line, to imaginary complex numbers, which are points on a plane, and as a result of thinking about what to do there, this shape was born.

This shape is very complicated.

The equation is hidden there, z is z squared plus c.

Very simple, very dry.

Very uninteresting.

Now turn the crank once, twice, twice and the wonders will come out.

This is what comes out.

I'm not going to explain these things.

This comes out. This comes out.

So complex, so harmonious, so beautiful.

This comes up over and over and over again.

And discovering that these islands are more or less the same as the whole big thing was one of my great discoveries.

And all around you have this wonderful baroque decoration.

All of this comes from this little formula that contains whatever five symbols you have.

Then this.

This color was added for two reasons.

First of all, these shapes are so complicated that I don't know what the numbers mean.

And if you want to plot them, you have to choose some system.

My principle was to always represent the shapes in different colors. Because some colors emphasize it and others emphasize it.

It's very complicated.

(Laughter) In 1990, I was in Cambridge, England.

Three days later, a pilot was flying over to pick up an award from the university and spotted this.

So where did this come from?

It's clearly extraterrestrial.

(Laughter) Well, the Cambridge papers ran an article about the "discovery," and the next day I got 5,000 letters from people saying, "But it's just a very large Mandelbrot set."

Okay, let's finish.

This shape was born out of pure mathematics practice.

Bottomless Wonders are born from simple rules that repeat endlessly.

thank you very much.

(applause)

I'd like to start with a Seth Godin-esque story when I was 12 years old.

Uncle Ed gave me a beautiful blue sweater - at least I thought it was beautiful.

And there was a fluffy zebra walking on my stomach, and Mount Kilimanjaro and Mount Meru just across my chest, which was also blurry.

And I wore it whenever I could, thinking it was the nicest thing I had.

Until one day in 9th grade when I was standing with some soccer players.

And my body is definitely changing, and Matt, my definite nemesis in high school, said in a bouncy voice that we no longer had to go on far ski trips and that we could all ski on Novogratz.

(Laughter.) And I was so humiliated and frustrated that I immediately ran back to my mother and accused her of keeping me in that awful sweater forever.

We drove to Goodwill and threw away our sweaters somewhat ceremonially. My idea was that I would never have to think or look at that sweater again.

Fast Forward -- Eleven years later, I'm a 25-year-old kid.

I was working in Kigali, Rwanda and was jogging down a steep hill. Then, 10 feet in front of me, I saw a little 11-year-old boy in my sweater running towards me.

And I'm thinking, "No, it's not possible."

But out of curiosity, I ran up to the kid—frightening the living Bejesus out of him, of course—grabbing him by the collar and turning it inside out, this sweater had my name on the collar.

I tell that story because it has served and continues to serve as a metaphor for the level of connection we all have on this planet.

We often don't realize how our actions and inactions affect people we may never see or know.

Also, I tell this story because it tells the larger context story of what help is and is possible.

This played a part in Virginia's goodwill, paving the way for a larger industry that at that time was supplying millions of tons of used clothing to Africa and Asia.

It was very nice to be able to offer clothing at low prices.

And at the same time, certainly in Rwanda, local retail has been destroyed.

That's not to say you shouldn't, but it should answer the questions that need to be considered when thinking about consequences and responses.

So I stayed in Rwanda around 1985 or 1986 and was doing two things there.

I started a bakery with an unmarried mother of 20.

We were called 'Bad News Bears' and the idea was to hunt down the snack food business in Kigali, but with no snacks in sight, it wasn't difficult.

And we had a great business model, so we did it and I saw these women change on a micro level.

But at the same time, I founded a microfinance bank. Tomorrow Iqbal Kudir will talk about Grameen, the father of all microfinance banks. Grameen is a global movement now, but we're talking about memes, which were all new at the time. Especially in an economy that is moving from barter to trade.

A lot of things worked.

We focused on our business model. In the game, I was particular about skins.

At the end of the day, the women decided for themselves how they could use this access to credit to set up small businesses to earn more and better support their families.

What we didn't understand, what was going on around us, a mixture of fear, ethnic conflict, and certainly the aid game, how it was affecting this invisible but certainly tangible movement within Rwanda, that 30 percent of the budget at the time was all foreign aid.

The genocide happened in 1994, seven years after women worked together to build this dream.

And the good news is that this financial institution survived.

In fact, the company has become the largest restructuring financier in the country.

The bakery was completely destroyed, but the lesson for me was that accountability is key. We had to build things with people on the ground using a business model where incentives matter, as Steven Levitt would say.

Understand that incentives matter, no matter how complicated they are.

So when Chris brought up how great everything was going on in the world and how we were seeing a shift in the zeitgeist, on the one hand, I totally agreed with him and was so excited to see what happened at the G8, the world is talking about global poverty because of people like Tony Blair and Bono and Bob Geldof. The world is talking about Africa in a way that I have never seen in my life.

It's thrilling.

And at the same time, what keeps me up at night is the fear that we will see the G8 victory of $50 billion in increased aid to Africa and $40 billion in debt relief as a victory beyond chapter one, as our moral pardon.

And really, all we have to do is celebrate it as the first chapter, and realize that we need a second chapter, all about execution and how-to.

And remember, one of the things I want to talk about today is that the only way to end poverty and make history is by building viable systems on the ground that provide critical and affordable goods and services to the poor in a financially sustainable and scalable way.

Then you can really create a history of poverty.

And that whole philosophy inspired me to start my current effort called the 'Acumen Fund'. The fund seeks to build a small blueprint of how it can be realized in the areas of water, health and housing in Pakistan, India, Kenya, Tanzania and Egypt.

I would like to talk a little bit about that. And I would like to show you some examples so that you can see what we are doing.

But before I do this, which is another complaint I hate, I want to talk a little bit about who the poor are.

Because we often talk of them as strong, gigantic people who yearn to be free, but in reality it is a very amazing story.

At a macro level, 4 billion people on earth earn less than $4 a day.

These are the people we are talking about when we think of the "poor people."

Combined, it's the third largest economy on earth, but most of these people are gone.

Where we usually work, there are people making between $1 and $3 a day.

who are these people?

They are farmers and factory workers.

They work for government agencies. they are drivers.

they are domestic.

They typically pay for essential goods and services such as water, health care and housing, paying 30 to 40 times what the middle class pays. That is certainly the case where we work in Karachi and Nairobi.

Poor people will and do make wise decisions when given the opportunity.

Now let me give you two examples.

One is India. India has 240 million farmers, most of whom earn less than $2 a day.

The Aurangabad land where we work is unusually dry.

There are people who earn 60 cents per dollar on average.

This pink-clad man is a social entrepreneur named Ami Tabar.

What he did was look at what was happening in Israel, a larger-scale approach, and find a way to drip irrigation that brings water directly to the plant stock.

However, until now it was only made for large farms, so Ami Tabar has modularized it and reduced it to 8 acres.

Some principles: Build small.

Make it infinitely scalable and affordable for the poor.

Sarita and her husband, the family, purchased the $15 unit when they were literally living in a tri-wall lean-to house with a tin roof.

After one harvest, their income increased enough to purchase a second system to harvest all four acres.

A few years later, I met them.

They now earn $4 a day, which is roughly middle class for India, and they showed me the concrete foundations they had just laid to build their houses.

And I swear, I can see the future in that woman's eyes.

what I truly believe.

Today, we cannot talk about poverty without talking about malaria bed nets. Once again, huge kudos to Jeffrey Sachs at Harvard for bringing this concept of anger to the world. $5 can save a life.

Malaria is a disease that kills 1 to 3 million people annually.

300-500 million cases have been reported.

The disease is estimated to cost Africa about $13 billion annually.

$5 can save a life.

We can send people to the moon. We can see if there is life on Mars - why can't we get a $5 net to 500 million people?

But the question is not "why can't you?"

The question is how can we help Africans do this themselves?

There are many hurdles.

The first is that the production volume is too small. 2: The price is too high.

3: This is a good road--it's right near where our factory is.

Distribution is a nightmare, but not impossible.

We started with a $350,000 loan to one of Africa's largest traditional mosquito net manufacturers, allowing them to transfer technology from Japan and build such long-lasting 5-year mosquito nets.

Here are some photos of the factory.

Three years later, the company now employs an additional 1,000 women.

It contributes about $600,000 in wages to the Tanzanian economy.

The largest company in Tanzania.

The current throughput rate is 1.5 million nets and will reach 3 million nets by the end of the year.

We hope to reach 7 million by the end of next year.

That's why the production side is also working hard.

But on the distribution side, the world as a whole has a lot to do.

Today, 95 percent of these nets have been purchased by the United Nations and are mainly provided to people around Africa.

We are looking to tap into Africa's most precious resource: its human resources.

their women.

So I want you to meet my namesake Jacqueline, 21 years old.

I mean, if she was born anywhere but Tanzania, she could run Wall Street.

She runs two of them and has already saved enough money for a home down payment.

She earns about $2 a day, has created an education fund, and told me she won't get married or have children until these things are done.

So when I told her about our idea that maybe we could take a Tupperware model from the US and find a way for the women themselves to go out and sell these nets to other people, she immediately started calculating what she could make and signed up.

We took a lesson from one of our favorite companies, IDEO, quickly built a prototype, and took Jacqueline to her area.

She took 10 women she knew and asked if she could sell the net for $5 apiece, even though they said no one would buy it. We learned a lot about how to sell things.

She didn't even talk about malaria until the end, so we couldn't bring our own concept.

First, she talked about comfort, status and beauty.

She said that if you put these nets on the floor, the insects will leave the house.

Children can sleep through the night. The house looks beautiful. you hang them in the window.

And then we started making curtains. Not only is it beautiful, but it can convey the status to people that you care about your children.

Only then did she talk about saving your child's life.

There are many lessons to be learned regarding how to sell goods and services to the poor.

I would like to end by saying that there is a great chance that poverty will go down in history.

To do it right, we need to build a business model that is significant, scalable, and works with Africans, Indians, and developing nations who fall into this category to do it themselves.

Because at the end of the day, it's the engagement that counts.

It's about understanding that people don't really want handouts, they want to make their own decisions. They want to solve their own problems. And by engaging with them, we can create greater dignity, not only for them, but for us as well.

So next time I ask all of you to think about this concept that we all have and how we approach this opportunity to make history of poverty. It's about really participating in that process, stepping away from the world that's just us and them, and recognizing that it's a problem for all of us, the kind of world we want to live with and share.

thank you.

(applause)

I'm Ellen I am obsessed with food.

But I wasn't obsessed with food to begin with.

My fascination with global security policy began because I lived in New York during 9/11 and it was very real.

The reason I got interested in food through global security policy is because when I'm hungry, I get really angry, and I think the rest of the world is the same.

Especially if you and your kids are hungry, the kids in your neighborhood are hungry, and the whole neighborhood is hungry.

And indeed, the hunger-stricken parts of the world are also likely to be the most insecure.

So I got a job at the United Nations World Food Programme, trying to address these security issues through food security issues.

It was there that I found what I thought was the best of their programs.

It's called 'school feeding' and it's a very simple idea to intervene and stop the cycle of poverty and hunger that continues to so many people around the world.

Free school meals get children into school, education, a first step out of poverty, but also provide them with the micro- and macronutrients they need for their mental and physical development.

I met this girl when I was working at the United Nations. Her name is Lauren Bush.

And she came up with a really cool idea to sell a bag called the "Feed Bag". The Feed Bag can be strapped on so it's really beautiful and ironic.

But each bag we sell is equivalent to one child's school lunch for one year.

It was so easy, we figured it would cost us $20 to $50 to provide school meals for a year.

Selling these bags can raise a lot of money and awareness for the World Food Programme.

But at the United Nations, we were basically told no, partly because things move slowly.

And we thought this was a really good idea and would raise a lot of money.

So we said, 'No more, let's start our own company,' and we did it three years ago.

My first dream was to start a company called FEED. Here is a screenshot of our website.

Just one month after the earthquake, we made bags for Haiti to provide school meals to Haitian children.

So FEED is doing great.

We have sold 550,000 bags, tons of bags, and fed 55 million meals to children around the world.

All this time you really have a hard time thinking about hunger. Because what we think is eating.

I'm thinking of eating a lot and I really love it.

And the strange thing about talking about international hunger and international issues is that most people want to know, "What are you doing for America's children?"

Hunger definitely exists in America, with a population of 49 million and about 16.7 million children.

I mean, it's pretty dramatic for our country.

Hunger in America means something different than it does internationally, but addressing hunger at home is very important.

But the bigger problem we all know is obesity, and it's dramatic.

Another dramatic thing is that both hunger and obesity have actually increased in the last 30 years.

Unfortunately, obesity is not just an American problem.

In fact, it's spread all over the world, mainly through the food systems that we export.

The numbers are pretty crazy.

1 billion people are obese or overweight and 1 billion are hungry.

These seem like two separate issues, but I started thinking about what obesity and hunger are.

Well, both stories are about food.

And when you think about food, it's potentially problematic agriculture that sustains food in both cases.

And agriculture is where food is produced.

American agriculture is very interesting.

It is very integrated and the food it produces leads to the food we eat.

The foods produced are more or less corn, soybeans and wheat.

And that's three-quarters of the food we eat: processed and fast food.

Unfortunately, our farming system hasn't done a good job over the past 30 years, despite exporting these technologies around the world.

So agriculture in Africa, the world's most hungry country, is actually declining sharply as hunger increases.

So somehow we don't make the link between exporting the superior agricultural systems that help feed the world.

who is doing the farming? That's what I was wondering.

So I stood over a large grain bunker in the Midwest. It didn't help me understand agriculture, but I think it's a great picture.

And the reality is that the relationships between American farmers are, quite frankly, generally pretty big when I'm spending time in the Midwest.

And their farm is big too.

But farmers in other parts of the world are actually pretty lean, and that's because they're starving.

Most of the hungry people in the world are subsistence farmers.

And most of those people are women. This is a completely different topic, so I won't bring it up right now, but I'd like to do something feminist one day.

I find it very interesting to look at agriculture from these two sides.

There is large-scale integrated agriculture that has led to what we eat in America, starting around 1980 after the oil crisis. The country has experienced massive consolidation and a mass exodus of smallholder farmers.

And in the same period, we let African farmers do their thing.

Unfortunately, what is grown becomes what we eat.

And in America, much of what we eat leads to obesity, and the last 30 years have seen a major shift in how we eat.

it's crazy.

1 in 5 children under the age of 2 drink soda.

Hello! Don't put soda in the bottle.

But people do. because it's so cheap. So our entire food system has changed a lot in the last 30 years.

So this isn't just our country, we're actually exporting the system all over the world, and when you look at the data for the least developed countries, especially in the fast-growing cities, people are eating processed American food.

And from hunger and all the ill effects of hunger on health, we're going to move in a generation to obesity, diabetes, heart disease, and more.

In short, a troubled food system contributes to both hunger and obesity.

You won't beat dead horses, but this is a global food system with 1 billion starving and 1 billion obese.

I think that's the only way to see it.

And rather than looking at these two things as very separate and forked problems, it's very important to see them as one system.

We get a lot of our food from all over the world, and with people all over the world importing our food system, it's very important to start looking at our food system in a new way.

I've learned, tech folks here, and I'm not one of them at all, that it really takes 30 years for a lot of technology to be unique to us, like the mouse, the internet, Windows.

There is a cycle of 30 years.

I think 2010 will be a really interesting year. Because it marks the end of a 30-year cycle and the birthday of the global food system.

That's the first birthday I want to talk about.

If you really think this is what has happened in the last 30 years, there is hope.

This year marks the 30th anniversary of GMO crops and Big Gulp, Chicken McNuggets, high-fructose corn syrup, the American agricultural crisis, and the changing international approach to agriculture.

So there are many reasons to view the last 30 years as something like the creation of this new food system.

I'm not the only one who's been obsessed with it for the last 30 years.

Celebrities like TED Award winners Michael Pollan and Jamie Oliver both want to highlight the last 30 years as highly relevant to changing food systems.

Well, this year is also my 30th anniversary, so I'm very curious about 1980.

And a lot of things have happened in the world in my lifetime, and as a food obsessed human being, a lot of that has really changed.

So my second dream is to see the next 30 years as a time to change the food system again.

And we know what happened in the past, so if we start now and look long term at technology and improvements in the food system, we might be able to rebuild the food system, so when I give my next talk when I turn 60, I can say that it has succeeded.

So today I am announcing the start of a new organization, or new fund, within the FEED Foundation called The 30 Project.

And 30 projects focus on long-term ideas for food system transformation.

And by collaborating with international advocates tackling hunger and national advocates tackling obesity, I think we can really find long-term solutions that make the food system better for all.

We all tend to think these systems are very different and debate whether or not organic can feed the world, but in 30 years' perspective, collaborative ideas are more hopeful.

So I hope that by bringing together the ONE campaign and disparate organizations like Slow Food, we can discuss holistic, long-term, systemic solutions to improve food for all, even though they don't seem to have much in common at the moment.

Some ideas I've come up with are, look, the reality is: Children in the South Bronx need apples and carrots, and so do children in Botswana.

And how can those children be fed nutritious food?

Another thing that has become incredibly global is meat and fish production.

Understanding how to produce proteins in ways that are both environmentally and human healthy is critical in addressing issues such as climate change and petrochemical fertilizer use.

And, as you know, these are long-term and important themes, both for smallholder farmers in Africa and farmers and consumers in America.

I also think we need to think about processed foods in new ways. There, they actually factor in negative externalities such as petrochemicals and fertilizer runoff into the price of a bag of potato chips. So, if that bag of potato chips is inherently more expensive than an apple, it may be time to change the perception of individual responsibility in food choices. Because three-quarters of our products aren't just made from corn, soybeans and wheat, but choices really are choices.

30Project.org was born and I started by gathering a coalition of several organizations.

And it will grow even more in the coming months.

But I really hope that you will take a long-term view of things like our food system and think about how we can make a difference.

(applause)

Trees are the epitome of stagnation.

Trees have been rooted in the same place for generations of human beings, but when you shift your perspective from trunk to branch, they become very dynamic entities that move and grow.

And I decided to explore this movement by turning trees into artists.

I just tied the tip of the paintbrush to a twig.

I waited for the wind to blow and held the canvas up, and art was born.

The piece on the left is painted in Western Red Cedar and the piece on the right is painted in Douglas fir. What I learned was that, like Picasso and Monet, different tree species have different characteristics.

But I was also interested in tree movement and how this art could capture and quantify it, so I simply measured each line and summed it up to determine how far the single maple tree that made this painting moved in a year.

I multiplied the number of twigs per branch by the number of branches per tree and divided it by the number of minutes per year.

And I was able to calculate how far a tree would travel in a year.

you might guess.

The answer is actually 186,540 miles, or 7 laps around the earth.

So just by shifting your perspective from a single trunk to many dynamic twigs, you can see that the tree is not just a static entity, but a very dynamic entity.

And I started thinking about how to take this lesson of trees into account. I began to think about how to consider other beings who were similarly static and stuck, but seeking change and dynamics. One of those entities is our prison.

Prisons, of course, are places where people who break the law get stuck and locked inside bars.

And our prison system itself is at a standstill.

There are more than 2.3 million men and women incarcerated in the United States.

Their number is increasing.

100 prisoners will be released, 60 of whom will return to prison.

This desperate cycle of incarceration continues as funding for education, training and rehabilitation dwindles.

I decided to ask if the lessons I learned from trees as an artist could be applied to static institutions like prisons. I think the answer is yes.

In 2007, I started a partnership with the Washington State Department of Corrections.

We've started working with four prisons to bring science and scientists, sustainability and conservation projects to four state prisons.

We have science classes, and the men here are choosing to come to our science classes instead of watching TV or weightlifting.

I think that's the movement.

We partnered with the Conservation Society for Inmates at Stafford Creek Correctional Center to grow endangered grassland plants for the restoration of Washington State's heritage grasslands.

I think that's the movement.

We worked with the Washington State Department of Fish and Wildlife to raise the endangered Oregon spotted frog for later release into protected wetlands.

I think that's the movement.

And just recently, we have started working with men who are quarantined in what we call Supermax facilities.

They have used violence against guards and other prisoners and committed violent violations.

They are kept in bare cells like this 23 hours a day.

When they have meetings with review boards and mental health professionals, they are placed in static booths like this one.

They are brought to this stark, innocuous playground for an hour a day.

We can't bring trees, grassland plants, and frogs into these environments, but we bring images of nature into the playground and put them on the walls so that at least they have a visual image of nature.

This is Mr. Lopez, who has been in solitary confinement for 18 months. He offers his opinion on the kind of imagery he believes will make him and other inmates softer, gentler and less violent.

And I think what we're seeing is that small collective movement for change can probably move an existence like our prison system in the direction of hope.

Looking at the trunk of a tree, we can see that the tree is a static entity.

But if trees can create art, if trees can circle the earth seven times a year, if prisoners can grow plants and if they can raise frogs, then perhaps the static entities we carry within ourselves, such as grief, addiction, and racism, can also change.

thank you very much.

(applause)

I still remember the day at school when my teacher told me that the world population had reached 3 billion. It was 1960.

I'm going to talk about how the world's population has changed from that year to the future, but I won't use digital technology, as I did in my first five TEDTalks.

Instead, I'm making progress and today I'm announcing this box of all-new analog educational technology purchased from IKEA.

There are 1 billion people in this box.

And our teacher said that in 1960 the developed world had a population of 1 billion.

There are two billion people in developing countries, she said.

And they lived apart at the time.

There was a big gap between 1 billion people in developed countries and 2 billion people in developing countries.

In developed countries, people were healthy, educated, wealthy, and had small families.

And their desire was to buy a car.

And in 1960, every Swede was saving up to buy a Volvo like this.

This was the economic level of Sweden.

But in contrast, in far-flung developing countries, the average family's desire there was to secure food for the day.

They were saving up to buy a pair of shoes.

When I grew up, the world was a huge chasm.

And this gap between the West and the rest of the world created the way we think about the world, which we still use linguistically when we talk about "the West" and "the developing world."

But the world is changing, and it's getting late to upgrade your thinking and classification of the world and make sense of it.

That's what I'm going to show you. Because what happened in the world between 1960 and 2010 was an astounding 4 billion people added to the world's population.

Look how many there are.

The world's population has doubled since I went to school.

And, of course, there was economic growth in the West.

Westerners migrated here as it happened that many businesses grew the economy.

And now their desire is not only to have a car.

Now they want to spend their vacation in a very far away destination and they want to fly.

This is their situation today.

And the most successful of the developing nations, as you know, developed and came to be called emerging economies.

They are buying a car now.

And what happened a month ago was that China's Geely bought Volvo, and finally the Swedes realized something big had happened in the world.

(Laughter.) So there they are.

And the tragedy is that two billion people here struggle for food and shoes and are still nearly as poor as they were 50 years ago.

The new thing is that we have the biggest billions, $3 billion here. These countries are also becoming emerging countries. Because they are very healthy, relatively well-educated and, like the [wealthier] people, they already have two or three children per woman.

And their desire now is of course to buy a bike and then they want to have a bike as well.

But this is the world today and there are no more gaps.

But the distance between the poorest people here, the very poor, and the richest people here is greater than ever before.

But the world is continuous: walking, biking, driving, flying. There are people on all levels and most people tend to be somewhere in between.

This is the new world of today in 2010.

And what will happen in the future?

Well, let's try to predict the year 2050.

I recently went to Shanghai to ask what was going on in China, and I have no doubt that China will catch up, just like Japan.

All projections say that this projection [1 billion] will only increase by 1-2 or 3 percent.

[But this second one] will grow seven or eight percent and we'll end up here.

they will start flying.

And these low-, middle- and emerging-income countries will also move forward economically.

And if we invest in the right green technologies, and if we can avoid severe climate change and energy remains relatively cheap, they will rise to this point.

And they will start buying electric cars.

You will find this there.

But what about the poorest two billion people?

What will happen to the poorest two billion people here?

Will they move on?

Now, this is where population [increase] comes into play. Because [some emerging economies] already have two to three children per woman, family planning is widespread, and population growth is coming to an end.

Here (the poorest) the population is growing.

So these [poorest] 2 billion people will grow to 3 billion in the coming decades and then to 4 billion.

This growth can only be stopped by nuclear warfare of a kind never before seen.

Because we are already moving forward with this [growth].

But population growth will stop in 2050 only if [the poorest] get out of poverty, get an education, have better child survival, buy bikes and cell phones and [can live] here.

You can't have people on this level looking for food or shoes. Because the population will continue to grow.

To explain why, let's go back to old digital technology.

Here is my country bubble on the screen.

Every bubble is a country. The size is the population.

Colors indicate continents.

The yellow there is the Americas. Dark blue is Africa. Brown is European. Green is the Middle East, this light blue is South Asia.

Over there is India, over there is China. Size is population.

Here, every woman has a child. 2 kids, 4 kids, 6 kids, 8 kids, big families, small families.

The year is 1960.

And here is the child survival rate, the percentage of children who survive from infancy to the time they start school. 60 percent, 70 percent, 80 percent, 90 percent and almost 100 percent, as in today's richest and healthiest countries.

But look, this is the world my teacher was talking about in 1960. We have a billion Western worlds here, with high child survival rates and small families. And all the rest are rainbow developing countries with very large families and low child survival.

What happened? I start the world please.

Do you see that the survival rate of children increases as the years go by?

They receive soap, hygiene, education, vaccinations, penicillin, and family planning. Family size is declining.

With child survival reaching 90 percent, families are dwindling and most of the Arab countries of the Middle East are down there.

Look, Bangladesh has caught up with India.

Emerging countries as a whole join the West in terms of high child survival and small family sizes, but they still have the poorest billion people.

Poorest billion, can you see the [two] boxes I had here?

they are still here

And child survival is still only 70 to 80 percent. So if you have 6 children, at least 4 will survive to the next generation.

And the population doubles in one generation.

So the only way to really stop the world population is to continue improving child survival rates to 90 percent.

That's why investments by the Gates Foundation, UNICEF, aid agencies, and central governments of the poorest countries are so good. Because they are actually helping us reach a sustainable population size for the world.

It is possible to stop at 9 billion if you do the right thing.

Child survival is the new green.

Only if children survive can we stop population growth.

And will it happen?

Well, I'm neither an optimist nor a pessimist.

I am a very serious "possibilityist".

This is a new category that breaks down emotions and engages with the world analytically.

It is possible.

We can have a fairer world.

With green technology, investment in poverty alleviation, and global governance, the world could be like this.

And look at the old west location.

Remember when this blue box was all alone leading the world and living its own life?

This will not happen [again].

The role of the old West in the new world is to be the foundation of the modern world, nothing more, nothing less.

But it's a very important role.

Do it well and get used to it.

thank you very much.

(applause)

A few years ago I embarked on a mission to find God.

Now, I will tell you frankly that I have failed, and as a lawyer it is really hard to admit.

But in that failed journey, many things I found were enlightening.

And one thing in particular gave me great hope.

It has to do with the magnitude and importance of our differences.

So, I was raised in America by Indian parents. Although culturally Hindu, they follow a strict and relatively unknown religion outside of India called Jainism.

To explain how minority I am, Indians make up roughly 1 percent of the US population. Hindus, about 0.7 percent. Jains, at most 0.00046 per cent.

To put this in context, more people visit a teddy bear factory in Vermont each year than Jains in America.

Adding to my minority make-up, my parents decided, "Great idea! Let's send her to Catholic school." (Laughter) My sister and I were the only non-white, non-Catholic students in the entire school.

At the Infant Jesus of Prague School (yes, that's what it was called) in Frothmoor, Illinois, we were taught to believe that there was one supreme being responsible for the entire shebang, from the creation of the universe to moral shepherds to eternal life.

At home, however, I was taught something completely different.

Jain believers do not believe in a single Supreme Being or even a team of Supreme Beings.

Instead, we are taught that God manifests as the perfection of each of us as individuals, and that in fact we spend our lives removing bad karma that prevents us from becoming perfect like God.

In addition, one of the core principles of Jainism is called 'non-absolutism'.

Non-absolutists believe that no one person can possess ownership or knowledge of absolute truths, even regarding religious beliefs.

Try the concept on Catholic school priests and nuns.

(Laughter) No wonder I was confused and overly aware of how different I was from my colleagues.

Twenty-odd years later, I found myself to be a very spiritual person, but I struggled.

I was homeless in spirit.

I found myself to be "None". This is not an acronym, or a clever wordplay, or any of that.

It's just the painfully uninspired name Pew Research gives to anyone who ticks "none" when asked about their religious affiliation.

(Laughter) Now, there are some interesting things about the nose. It's that we're outnumbered and young people are skewed.

In 2014, there were more than 56 million religiously non-religious people in the United States.

And more than one-third of adults between the ages of 18 and 33 are non-racial.

But the most interesting thing about Nons to me is that we are often spiritual.

In fact, 68 percent of us believe with some degree of certainty that God exists.

I don't know who it is.

(Laughter.) So when I realized I was no and the information was out there, the first thing that came to my mind was that I wasn't alone.

It was really reassuring to finally be part of a group with many American members.

But the second, not so reassuring one, is that, oh, we have a lot of people.

That's not good. Because if many spiritual people don't have God now, finding God may not be as easy as I originally expected.

So I decided in my spiritual journey to avoid the obvious places and skip big religions entirely, and instead step into the spiritual fringes of mediums, faith healers and divine beings.

But remember, I'm not an absolutist. I mean, I tend to keep a pretty open mind, and that turned out to be a good thing. Because I went to a witch potluck dinner at the LGBT Center in New York City and befriended two witches there. I drank a five-gallon jerrycan full of volcanic water with a shaman in Peru. I had a saint hug me at the convention center—she smelled really good—lol. I chanted for hours in a smoke-filled, heat-filled sweat lodge on a Mexican beach. Worked with a tequila-drinking medium to meet the dead. Among them, bizarrely, was both his late mother-in-law and the late manager of hip-hop group The Roots.

(laughter) Yes, my mother-in-law said that she was very happy that her son chose me as his wife.

Of course! But -- (laughter) Yes.

But the Roots manager said I might as well cut back on the amount of pasta I was eating.

I think we can all agree that my husband was lucky it wasn't his late mother who encouraged me to cut back on carbs.

(laughter) I also joined a laughter yoga group in South Africa. Witnessed a woman orgasm for 45 minutes – this is not a myth – when she harnessed cosmic energy – I think I’ll go back there – (laughter). And laid an old Indian man on top of me, and no, he was not my husband.

He was a total stranger named Paramji who was chanting into my chakras harnessing the power of cosmic energy to heal my yoni, Sanskrit for 'vagina'.

(Laughter) I was going to have a slide here, but a few people suggested that my Yoni slide at TED wasn't the best idea, even TEDWomen.

(Laughter.) Very early in my quest, I also went to see a Brazilian faith healer, John of God, at his compound in Brazil.

Now John of God is considered a full trance medium, which basically means he can converse with dead people.

But in his case, he claims to be channeling a very specific group of dead saints and doctors to cure whatever is wrong with you.

John of God does not have a doctor's degree or a high school diploma, but he does perform serious surgery with a scalpel and without anesthesia.

Yes I don't know.

He also offers invisible surgery that doesn't require an incision, and surrogate surgery, which is said to treat someone thousands of miles away by operating on a loved one.

Now, when visiting John of God, there are all sorts of rules and regulations.

It's all complicated, but the point is, go to John of God, show him three things you want him to fix, and he'll let the dead saints and doctors work for you to finish the job.

(Laughter) Now, before you chuckle, consider that, according to at least his website, more than eight million people, including daytime TV goddess Oprah, were going to see John of God, and I was pre-wired to keep an open mind.

But to be honest, the whole thing was strange and inconclusive for me, and in the end I went home even more confused than I had started.

But that doesn't mean I left empty-handed.

In the weeks leading up to my trip to Brazil, I spoke to friends and a few Google colleagues who were lawyers at the time about our plans.

And since I'm talkative, I might have mentioned this to a few more: my neighbors, the man who works at the local coffee shop I go to every morning, the woman who runs the checkout at Whole Foods, the stranger who sat next to me on the subway.

I told each of them where they were going, why they were going, offered to take three of their wishes back to Brazil, and explained that anyone who went to see John of God could save the trip on behalf of someone else.

And to my surprise, my inbox overflowed.

A friend passed it on to a friend, who in turn passed it on to more friends, other strangers, coffee shop clerks, until a few days before I left for Brazil, it seemed like everyone knew my email address.

And at the time, all I could conclude was that I gave too much to too many people.

But years later, when I actually read those messages back, I realized something completely different.

In fact, these emails had three things in common, the first of which was pretty interesting.

Almost everyone sent me detailed details on how to contact them.

I used to tell them, or their friends, that they needed a photo, name, and date of birth, along with a list of three things they wanted fixed.

However, they gave me the full address, including apartment number, zip code, etc., as if John of God was going to drop by their house to meet in person or send a package.

It was as if they just wanted to make sure their wishes were not delivered to the wrong person or the wrong address, even though their wishes were very unlikely to be granted by John of God.

Even if they didn't believe it, they were hedging their bets.

The second commonality was equally interesting, but much more humble.

The stranger in the subway, the man in the coffee shop, the lawyer in the hallway, the Jew, the atheist, the Muslim, the devout Catholic, virtually everyone asked for essentially the same three things.

OK, there were some outliers and yes, a few people asked for cash.

But when we finally ruled out a handful of anomalies, we found striking similarities.

Nearly everyone sought the health of themselves and their families first.

Almost without exception, they sought happiness next, followed by love, in that order health, happiness, and love.

Sometimes they asked for solutions to specific health problems, but often they just asked for general health conditions.

Each of them spoke of happiness in slightly different ways, but they also wanted the same specific subtype of happiness, the kind that would permeate and take root in the soul. The kind of happiness that sustains us even if we lose everything else.

And about love, they all wanted romantic love, the kind of soulmate we read about in epic romantic novels, the kind of love that would stay with us until the end of life.

I'm sorry, it's my husband.

Rubbish! I have forgotten where I am now.

(Laughter) (Applause) So, by and large, regardless of background, race, or religion, all these friends and strangers wanted the same thing, and they were exactly what I really wanted, a simplified version of the basic human needs identified by social scientists like Abraham Maslow and Manfred Max Neef.

No one was looking for the answers to the big existential questions, the proof of God and the meaning of life that I was trying to find.

They didn't even call for an end to war or global hunger.

They all wanted health, happiness, and love, even if they could really ask for anything.

So these emails also had a third thing in common.

All had exactly the same ending.

Instead of thanking them for bringing their wishes to Brazil, they said, "Don't tell anyone."

So I decided to tell everyone -- (laughter) on this stage, not because I can't be trusted, but because the fact that we have so much in common, felt especially important for all of us to hear, especially now that many of the world's problems seem to keep us focused on what's different rather than what brings us together.

And look -- I'm not a statistician, and I'll be the first to admit that the data I've just accumulated in your inbox is anecdotal rather than scientific, and qualitative rather than quantitative.

As anyone who works with data will tell you, this is not a statistically significant or demographically balanced sample.

But nonetheless, I find myself thinking about those emails every time I reflect on the prejudices and prejudices I've faced in my life, or whenever there's a new hate crime or a senseless tragedy that highlights a discouraging sense that our differences may be insurmountable.

And I remind myself that the humble and united commonality of our human race is that most people, if given the chance to ask for something, would want the same thing, and there is evidence that this is true whoever we are, whatever name we call our God, or whatever religion we call home.

Then, apparently there are some of us who want these things so badly that they email a mentally confused noe like me - some might say they are otherwise confused - and seek out this stranger in case there is the slightest chance that someone who is not God, much less our God, or even a member of our chosen religion, who seems unlikely to deliver when you see him on paper, might grant that wish. Also note that you will be emailing your wishes.

And now, looking back on my spiritual quest, even though I didn't find God, I found my place in this. Even today, in a world divided by religious, ethnic, political, philosophical, and racial divisions, despite all our apparent differences, at the end of the day, and at the most basic level, we are all the same.

thank you.

(applause)

Nina Drubik Blochmann: We grew up believing that the hymen is the mark of virginity.

But as it turns out, we were wrong.

What we have discovered is that the common story we are told about female virginity is based on two anatomical myths.

This truth has been known to the medical community for over 100 years, but somehow these two myths continue to make life difficult for women around the world.

Ellen Stocken Dahl: The first myth is about blood.

It tells us that the hymen ruptures and bleeds when a woman has vaginal intercourse for the first time.

In other words, if there was no blood on the sheets afterwards, the woman simply wasn't a virgin.

The second myth is a logical consequence of the first.

Because the hymen is believed to break and bleed, it is believed that the hymen either actually disappears or is somehow fundamentally altered during a woman's first sexual intercourse.

If that is true, a virginity test would make it easy to determine if a woman is a virgin by examining her genitals.

NDB: These are our two myths. The virgin bleeds and the hymen is permanently lost.

Now, this may sound like a minor problem to you.

Why should you care about the small, inconspicuous skin folds on a woman's body?

But really, this is more than an anatomical misunderstanding.

Myths about the hymen have survived for centuries due to their cultural significance.

They have been used as powerful tools to control women's sexuality in nearly every culture, religion and decade of history.

Women are still distrusted, humiliated, hurt, and at worst subject to honor killings if they don't bleed on their wedding night.

Some women are forced to undergo degrading virginity tests simply to get a job, protect their reputation, or get married.

ESD: As in Indonesia, women are systematically screened for military service.

After the 2011 Egyptian riots, groups of women protesters were forced to undergo virginity tests by the military.

In Oslo, doctors are testing a girl's hymen to reassure parents that their children are not ruined.

And sadly the list still goes on.

Women are so afraid of not believing the myths about the hymen that they choose to use various quick-acting methods to protect their virginity to ensure bleeding.

It could be plastic surgery known as "re-virginity surgery," a vial of blood poured onto the sheets after sex, or a fake hymen purchased online with the promise of "kissing goodbye to a deep, dark secret."

NDB: We have terrified girls by telling them that nothing they do can be kept secret, that whatever happens will be revealed in their bodies.

Girls are afraid of spoiling themselves through sports, playing, using tampons, or having sex.

We have limited their opportunities and freedoms.

It's time to put an end to virginity fraud.

It's time to break down the myths about the hymen once and for all.

ESD: We are medical students, sexual health practitioners, and authors of "The Wonder Down Under."

(Laughter) It's a popular science book about female reproductive organs.

And in our experience, people seem to believe that the hymen is some kind of seal that covers the opening of the vagina.

Also called "hymen" in Norwegian.

And with this, we imagine something fragile, something that can be easily destroyed, perhaps something that can be torn, like a plastic wrapping sheet.

You may have wondered why I brought hula hoops to the stage today.

Introducing.

(Laughter) Now, it's very hard to hide that something happened to this hoop, right?

It's different before and after hitting.

Now that the seal is broken, it won't go back to its original state unless the plastic is replaced.

So if you want to do this hoop virginity check here and now, it's pretty easy.

It's easy to say that this hoop is no longer a virgin.

(laughter) NDB: But the hymen isn't some kind of plastic or sticker that you can wrap around food.

in fact ...

It's like a scrunchie or a rubber band.

The hymen is the rim of tissue at the outer opening of the vagina.

And usually it's donut-shaped or half-moon shaped, with a big hole in the middle.

But this is very different, the hymen may be streaked, it may have several holes, or it may consist of leaves.

In other words, the appearance of the hymen is naturally very different, which makes virginity testing very difficult.

ESD: Now that we know a little more about the anatomy of the hymen, let's return to two myths: virgins bleed and the hymen is lost forever.

However, the hymen does not need to be broken at all.

The hymen is like a scrunchie, not only visually, but functionally as well.

Can you stretch a scrunchie?

(Laughter) You can also stretch your hymen.

In fact, it is very elastic.

And for many women, the hymen is elastic enough to withstand vaginal intercourse without damage.

For other women, the hymen may tear slightly to make room for the penis, but that doesn't mean the hymen disappears.

But it may look a little different than before.

Of course, the hymen cannot be tested to confirm virginity.

This was pointed out over 100 years ago in 1906 by Norwegian physician Marie Jansett.

She examined a middle-aged sex worker and concluded that her genitals were reminiscent of a teenage virgin.

But that makes sense, right?

Because if her hymen wasn't damaged during sex, what were we expecting?

ESD: Since the hymen comes in all shapes, it is difficult to know if the dents and creases are due to previous damage or just normal anatomic variations.

The absurdity of virginity testing was revealed in a study of 36 pregnant teenagers.

Doctors examined the hymen and found obvious signs of penetration in only two of the 36 girls.

So unless you believe the 34 cases of virgin birth, (laughter) we should all agree that our second myth also suffered a fatal blow.

You can't look between a woman's legs and read her sexual talk.

NDB: Like most myths, the myth about the hymen is not true.

There is no virginity mark that magically disappears after sex, and half of all virgins can easily have sex without bleeding.

I wish we could say that removing these myths would make all the difference, all the shame, all the harm, all the honor killings would go away.

But of course it's not that simple.

Sexual repression of women stems from something much deeper than simple anatomical misconceptions about the properties of the hymen.

It is a matter of cultural and religious management of female sexuality.

And it's much harder to change.

But we have to try.

ESD: As medical professionals, this is our contribution.

We want every girl, parent and [future] husband to know what a hymen is and how it works.

I want you to know that the hymen cannot be used as proof of virginity.

Then you can remove one of the most powerful tools being used to control young women today.

Having said this, you may be wondering what the alternatives are. If the hymen cannot be used as proof of a woman's virginity, what should be used?

We choose to use nothing.

(Cheers) If you really want to know— (applause) if a woman is a virgin, ask her.

(Laughter) But how she answers that question is her choice.

thank you.

(applause)

This is the sea that I once knew.

And I've been to the Gulf a few times, so I find it really traumatic. Now, every time I look at the ocean, no matter where I am, even though I know the oil is gone, I see a slick, and I realize that I am very annoyed by it.

But what I want to talk to you about today is not just about the oil spurt, but what it means and why it happened, a lot of things that try to put all this in context.

First, a little bit about me.

I'm basically a guy who likes to go fishing since I was a little girl, and I've been fishing, which led me to study seabirds to stay in the coastal habitats I love.

And now I'm writing a book mainly about how the ocean is changing, and the ocean is certainly changing very quickly.

Now, as you saw this diagram earlier, we actually live on hard, slightly damp marble.

The same is true for the atmosphere. If you take all the atmosphere out and roll it into a ball, you get the little ball of gas on the right.

So we live on the most fragile little soap bubble you can imagine, a very sacred bubble, but a very susceptible one.

And the burning of oil, coal, gas, all fossil fuels has changed the atmosphere greatly.

We are warming the climate.

So the Gulf eruption is just one part of the bigger problem we have with the energy we use to run our civilization.

Besides warming, there is also the problem of increasing acidification of the oceans, which is already visibly acidifying and is already affecting animals.

Now, in the lab, if you put shellfish at a pH of 7.5 instead of 8.1, which is the normal pH of seawater, they will dissolve in about three days.

If a 8.1 sea urchin larva is placed in an environment with a pH of 7.7, there will be no significant change, but it will morph and die.

Already, commercial oyster larvae are dying on a large scale in some places.

This problem has slowed coral reef growth in some places.

So this is really important.

Well, let's take a short walk around the bay.

One of the things that really impresses me about the Gulf people is that they are really, really aquatic people.

And they can handle water.

They can handle hurricanes that come and go.

They know what to do when the water goes down.

But if it's anything other than water and the aquatic habitat changes, they don't have many options.

In fact, there really aren't many options across these communities.

They can't do anything else.

They can't go and work in the local hotel business. Because there are no hotels in the community.

If you go to the Gulf and look around, you certainly see a lot of oil.

You can see a lot of oil in the sea.

When I went to the site of the explosion, the situation was quite unbelievable.

It seems that the oil pan of the car was emptied and thrown into the sea.

And I think one of the really most incredible things is that no one is trying to collect it where it is most densely packed.

Some of the ocean there looks really apocalyptic.

They are everywhere along the coast.

It's really messed up.

If you go to places where the waves are coming in, such as the eastern Gulf Coast of Alabama, there are people still using the beaches and others cleaning them up.

And they have a very strange way of cleaning the beach.

It is forbidden to put more than 10 pounds of sand in a 50 gallon plastic bag.

They have thousands of plastic bags.

I don't know what they would do with all that.

They didn't see the "Do not enter the water" sign.

their children are in the water. They have tar on their clothes and sandals and they are a mess.

And there's basically no one there anymore, just a few people trying to keep using it.

I see people who are really shocked.

They are very hard working people.

All they know about life is that they get up in the morning and go to work when the engine starts.

They always felt they could rely on the guarantees that nature provided through the bay's ecosystem.

They are beginning to realize that their world is really crumbling.

And you can literally see signs of their shock...

A sign of their anger...

A sign of their anger...

and signs of their grief.

These are things you can see.

There are many things you can't see in the water.

What is going on underwater?

Well, some say there is an oil plume.

And Rep. Markey asks, "Are we going to be on a submarine to see if there really is an oil plume?"

But I had to do a little experiment myself to see if there was oil in the Gulf of Mexico, especially since I couldn't go on a submarine until today, especially since I knew I was going to be here.

So this is the Gulf of Mexico...

A shining place full of fish.

And caused a small oil spill in the Gulf of Mexico.

And I found out that I actually confirmed the hypothesis that oil and water don't mix...

Until you add the dispersant...

they start to mix.

And with a little energy from the wind and waves, havoc ensues. It creates such havoc that it cannot be cleaned, touched, or removed. And most importantly, this is what I think, invisible.

I think it's hidden on purpose.

Now this is such a catastrophe and so confusing that a lot of information is leaking out the edge of the information stream.

However, as many have said, there is a massive attempt to suppress what is happening.

Personally, I think dispersants are the primary strategy for hiding bodies, as you leave the crime scene to the killer.

But we get it.

In my opinion, they don't want evidence, so we know that the places where the oil is concentrated on the surface are being attacked.

OK。

I heard that bacteria eat oil?

The same goes for sea turtles.

Even if it breaks down, it takes a long time to reach the bacteria.

turtles eat it Enter the gills of the fish.

They have to swim through it.

I heard the most incredible story on the train that comes here today.

A writer named Ted Williams called me. He writes for Audubon magazine, so he had some questions about what I had seen.

He said he was in the Gulf not long ago. About a week ago, a man who was a recreational fishing guide took him in and showed him what was going on.

Bookings have been canceled for the entire calendar year for that guide.

Everyone wants their deposit back and everyone is running away.

It's the story of thousands of people.

However, he tells Ted that on the last day he was out, a bottlenose dolphin suddenly appeared next to the boat, spewing oil from its blowhole.

And he left because he knew it was his last fishing trip and the dolphins would scare the fish.

So he got away from it, and after a few minutes he turned around and it was again right next to the side of the boat.

He said he had never seen a dolphin do that in his 30 years of fishing.

And he felt it -- (sighs) He felt it coming for help.

Now, about 30 percent of the killer whales died in the first few months of the Exxon Valdez spill.

Their numbers have never recovered.

Therefore, all these recoveries will be variable.

Some things may take longer.

And I think some things will probably come back a little sooner.

Another important point about the Gulf is that many animals congregate there at certain times of the year.

The Gulf is therefore a very important body of water, more important than the same amount of water in the open Atlantic Ocean.

These tuna swim across the ocean.

They come inside when it's time to lay their eggs. These two tagged tuna can be seen in the very slick area of ​​the spawning grounds.

Perhaps this year, at the very least, we will have a devastating spawning season.

I expect that adults are probably avoiding the dirty water.

They usually don't like going into very murky water anyway.

But these are really high performance, athletic animals.

I don't know what this kind of thing would be in their gills.

I don't know if it affects adults.

If not, I'm pretty sure it's affecting eggs and larvae.

But if you look at the graph that goes down and down, that's what we've done to this species through decades of overfishing.

So, while oil spills, leaks, and eruptions are catastrophes, I think it's important to keep in mind that we've been doing a lot for a very long time to affect what's in the ocean.

We don't start with what was okay.

We are starting with something that originally had a lot of stress and a lot of problems.

If you look around for birds, you'll find that many birds congregate in the bay at certain times of the year, but then leave.

And they inhabit a much wider area.

For example, most of the birds in this photo are migratory birds.

All were in the Gulf in May, but oil was beginning to land in some places.

At the bottom left is a red turnstone and a thunder ring.

It breeds in the Arctic highlands and winters in southern South America.

However, they are concentrated in the Gulf and then fan out across the Arctic.

I saw birds breeding in Gulf Greenland.

So this is a hemispherical problem.

The economic effects will affect at least nationally in different ways.

The biological effects are certainly hemispherical.

I think this is one of the most amazing examples of complete unpreparedness I can think of.

Even when the Japanese bombed Pearl Harbor, they at least shot back.

And we seem to have no idea what to do.

Nothing was ready, as you can see by what they were doing.

What they do is mostly booms and dispersants.

Booms were never made for open water.

They don't want to confine themselves to the places where the oil is most concentrated.

They approach the shore -- look at these two boats.

And you know, there's literally hundreds of thousands of square miles in the Gulf right now, and there's oil on the surface, and I think that's a great name for a ship that's dragging a boom among ships and doing whatever it takes to stop this.

Dispersants drive the oil under the boom.

Boom diameter is only about 13 inches.

So it's completely crazy.

A shrimp boat is used here.

Hundreds of shrimp boats are used to pull booms instead of nets.

It's easy to see that all the oily water is just going over the back of the boom.

All they are doing is stirring.

It's ridiculous.

Also, every booming coastline, hundreds of miles of coastline, every booming coastline has an adjacent non-booming coastline.

It is quite possible for oil or dirty water to enter.

Below is a photo of a booming bird colony.

Everyone is trying to protect the bird colony there.

Well, as an ornithologist, I can tell you that birds fly, and (laughs) it doesn't work just to grow a colony of birds. it won't.

These birds make their living by diving.

in fact ...

Rather, I think what they should be doing is trying hard to protect their nests. In fact, if they destroy all the nests, some birds will fledge and it will be better for them this year.

As long as you clean them...

I don't blame the people cleaning the birds.

It is really very important that we express our compassion.

I think the most important thing that people have is "compassion".

Getting an image of them and showing it is very important.

But where are those birds actually released?

It's like getting someone out of a burning building, treating them if they breathe smoke, and sending them back into the building because the oil is still gushing out.

I refuse to admit this as something of an accident.

I think this is the result of gross negligence.

(Applause.) It's not just blood pressure.

BP has run very sloppy and very reckless, just because they can.

And they were allowed to do so because government oversight, which is supposed to protect us, has failed utterly.

It turns out that all merchant ships in the United States display this sign. Spilling a few gallons of oil would be a big problem.

And we must seriously consider who the law was made for and who has gone beyond it.

And there are things we can do in the future.

I was able to get the kind of equipment I really needed.

After drilling 30,000 holes for oil in the seafloor of the Gulf of Mexico, it's not too hard to predict that oil might emerge from one of them.

And you will have some idea of ​​what to do.

But I think we need to understand where this leak actually started.

It really started by destroying the idea that government exists for our government and to protect the greater public good.

So I think the oil bursts, the bank bailouts, the mortgage crisis, and all these are symptoms of the very same cause.

We still seem to understand that we need a police force to protect us from at least a few bad guys.

And the police sometimes give us tickets and stuff like that, which can be a little annoying, but no one says they should be disposed of.

But now, and for at least the last 30 years, across other government agencies, there is a culture of deregulation caused directly by the people who need to protect us from buying our government out of our control.

(Applause) Well, this has been a problem for a very long time.

At the time America was founded, corporations were found to be illegal, and even Thomas Jefferson complained that corporations were already rebelling against our country's laws.

Well, people who say they're conservative will tell these companies to hell with them if they really want to be conservative and patriotic.

That's the true meaning of being conservative.

So what we really need to do is restore the idea that it is our government that is guarding our interests, and restore the sense of unity and common cause that has really been lost in our country.

I think there are signs of hope.

The Glass-Steagall Act of 1933, which was actually meant to protect us from whatever caused the recession, bank meltdowns and anything else that needed relief, was systematically scrapped.

There is now a mood to put some of them back in place, but lobbyists are already trying to loosen restrictions after the bill is passed.

So the battle continues.

This is a historic moment.

As many have pointed out today, we are either going to have a totally unmitigated catastrophe of this oil spill in the Gulf, or we will make the moment we need out of this situation.

There is certainly a common theme that this moment needs to be put to good use.

We have experienced this problem before with other methods of offshore drilling.

The first offshore well was called Whale.

The first offshore drill was called Harpoon.

That time we emptied the sea of ​​whales.

Ever since I lived in a cave, whenever I wanted energy I would set something on fire and I still do.

We still light something every time we need energy.

And people say clean energy is too expensive to use.

Who said it's too expensive?

People who sell fossil fuels.

We've been here before with energy, but people say the cheapest energy was slavery, and the economy won't survive the switch.

Energy is always a moral issue.

It's a matter of right or wrong.

thank you very much.

When I was a student here in Oxford in the 1970s, the future of the world looked bleak.

The population explosion did not stop.

Global hunger was inevitable.

Cancer epidemics caused by chemicals in the environment will shorten our lives.

Acid rain was falling in the forest.

The desert was advancing one to two miles a year.

Oil is running out and a nuclear winter will destroy us.

None of that happened (laughter) and amazingly, if you look at what actually happened in my lifetime, the average per capita income of the average person on the planet tripled in inflation-adjusted real terms.

In my lifetime, my life expectancy has increased by 30 percent.

Child mortality has been reduced by two thirds.

Per capita food production has increased by a third.

At the same time, the population doubled.

Whether you think it's a good thing or not, how did we achieve that?

How did you achieve that?

How did we become the only species to thrive as our population grew?

The size of the blobs in this graph represents the size of the population and the levels of the graph represent GDP per capita.

To answer this question, I think we need to understand how humans bring their brains together so that they can combine and recombine ideas, meet and actually interbreed.

In other words, we need to understand how ideas have sex.

Imagine how we went from making objects like this to making objects like this.

Both of these are real objects.

One is a 500,000-year-old Acheulean hatchet made by Homo erectus.

The other is obviously a computer mouse.

Both are surprisingly similar in size and shape.

I've tried to find out which one is bigger, but it's nearly impossible.

Both are designed to fit the human hand.

Both are technologies. After all, their similarities are not so interesting.

You can see that both are designed to fit the human hand.

It's the difference that interests me. This is because the one on the left was made with a design that has hardly changed for about 1 million years, from 1.5 million years ago to 500,000 years ago.

Homo erectus made the same tools for 30,000 generations.

Of course there have been some changes, but back then the tools were changing slower than the skeletons.

There was no progress, no innovation.

It's an anomaly, but it's a fact.

On the other hand, the object on the right will be obsolete after 5 years.

There is another difference. That is, the object on the left is made out of one substance.

The object on the right is made of sweets that combine various substances such as silicon, metal, and plastic.

And more than that, it's a combination of different ideas: plastic ideas, laser ideas, transistor ideas.

All of them are integrated in this technology.

And it is this combination, this accumulation of technology, that intrigues me. Because I think that's the secret to understanding what's going on in the world.

My body is also a collection of ideas. Ideas for skin cells, ideas for brain cells, ideas for liver cells.

they have gathered.

How does evolution do cumulative and combinatorial things?

Well, it takes advantage of sexual reproduction.

For asexually reproducing species, if two different mutations of green and red occur in different organisms, one must be superior to the other.

When one becomes extinct, the other survives.

However, if there are sexual species, one individual may inherit both mutations from different strains.

So what sex does is that it enables individuals to take advantage of genetic innovations across species.

It is not limited to one's lineage.

What processes have had the same impact on cultural evolution as sex has on biological evolution?

I think the answer is exchange, the practice of exchanging one thing for another.

It's a characteristic of humans.

No other animal does that.

Animals can be taught a little exchange in the lab, but reciprocity actually exists in other animals. But the exchange of one object for another never happens.

As Adam Smith said, "No one has ever seen a dog trade bones fairly with another dog."

(laughs) Culture can exist without interaction.

You can have an asexual culture, so to speak.

Chimpanzees, killer whales, these creatures have a culture.

They teach each other the traditions passed down from parent to child.

In this case, the chimpanzees are teaching each other how to crack nuts with stones.

But the difference is that these cultures never expand, never grow, never accumulate, never combine. The reason is that there is no gender and no exchange of ideas, so to speak.

Chimpanzee squads have different cultures.

There is no exchange of opinions between them.

And why would the exchange rate raise the standard of living?

Well, the answer came from David Ricardo in 1817.

And this is the Stone Age version of his story, but he told it in terms of trade between nations.

Adam takes 4 hours to make a spear and 3 hours to make an axe.

Oz takes 1 hour to make a spear and 2 hours to make an axe.

So Oz is better than Adam with both a spear and an axe.

He doesn't need Adam.

He can make spears and axes himself.

No, come to think of it, if Oz made two spears and Adam made two axes and replaced them, that would save an hour of work each.

And the more you do this, the more true it will become. Because the more you do this, the better Adam gets at making axes and the better Oz gets at making spears.

Therefore, profits from trade will only increase.

And this is one of the benefits of interaction, and in fact this creates an atmosphere of more specialization, which in turn creates an atmosphere of more interaction and so on.

Adam and Oz both saved an hour.

That's prosperity and saving time to meet your needs.

Ask yourself how long you'll have to work tonight to make sure you have an hour of reading time to finish your book tonight.

If you have to start from scratch, let's say you go out to the countryside.

find the sheep you kill it Remove the fat from it.

Render it. Make candles, etc.

How long does it take? quite a long time.

At the current average UK wage, how long would you really have to work to earn an hour of light reading?

And the answer is about 0.5 seconds.

In 1950, you would have had to work eight seconds for the average wage to get that much light.

And that's seven and a half seconds of prosperity you've gotten since 1950, so to speak. Because you can do something else or acquire another good or service during those seven and a half seconds.

In 1880, it would have taken 15 minutes to get this much light for the average wage.

In 1800, you had to work six hours to earn a candle that lasted an hour.

In other words, in 1800, the average person making an average wage couldn't afford a candle.

Return to this ax and mouse image and ask yourself, "Who made them and for whom?"

The stone ax was made by someone for himself.

It was self-sufficient.

These days we call it poverty.

But the object on the right was made for me by someone else.

how many others?

Ten? Hundreds? Thousands?

Probably millions.

Because you have to include people who grew coffee, people who were on oil rigs, people who drilled for oil, people who brewed it for people who were going to be plastic.

They all worked to make a mouse for me.

And that's how society works.

That is what we have achieved as a species.

In the old days, if you were rich, you literally had someone working for you.

That's how you get rich. you hired them

Louis XIV had many people working for him.

They made a silly costume for him, like this [laughs], they made a silly hairstyle and so on.

He had 498 people prepare dinner every night.

But modern tourists walking around the Palace of Versailles and looking at pictures of Louis XIV still have 498 dinners tonight.

They can be found in bistros, cafés, restaurants and shops all over Paris, ready within an hour to serve you a fine meal, perhaps of a higher quality than Louis XIV ate.

And that's what we've accomplished, because we're all working for each other.

We can raise each other's standard of living by making use of our expertise and interacting with each other.

Now other animals can work for each other too.

Ants are a classic example. Workers work for the Queen and Queens work for the Workers.

But the big difference is that it only occurs within colonies.

You cannot cooperate with each other across colonies.

The reason is that there is a division of labor for reproduction.

In other words, it specializes in reproduction.

The Queen will do it all.

Our species does not like that.

The only thing we insist on doing for ourselves is reproduction.

(Laughter) Even in England, we don't leave reproduction to the Queen.

(Applause) So when did this practice start?

And how long has it been going on? And what does that mean?

Well, I think perhaps the oldest version of this is the sexual division of labor.

But there is no proof of that.

It looks like the first thing we did was men work for women and women work for men.

In all today's hunter-gatherer societies, there is generally a division of foraging between male hunting and female gathering.

It's not always that simple, but there are differences between the professional roles of men and women.

And the advantage of this system is that it's a win-win.

This woman knows that in the case of the Hadza, they dig up roots to share with men in exchange for meat. They know that all they have to do to get protein is to dig up the excess roots and replace them with meat.

And she doesn't have to go out on an exhausting hunt and try to kill a warthog either.

And the man knows that nothing needs to be dug to put down roots.

All he has to do is when he kills a warthog, make sure it's big enough to share some.

Both sides raise each other's standard of living through the sexual division of labor.

When did this happen? We don't know, but it's possible Neanderthals didn't do this.

They were a very cooperative species.

They were a highly intelligent race.

Their brains, on average, ended up being bigger than yours and mine in this room today.

They were imaginative. they buried the dead.

They had language, probably because we know they have the same kind of FOXP2 gene as we do, which was discovered here at Oxford.

Therefore, they probably had language skills.

they were wonderful people. I'm not against Neanderthals.

However, there is no evidence of a sexual division of labor.

There is no evidence of group behavior by females.

The females seem to have hunted together with the males.

And another proof is exchanges between groups. This is because the items found in Neanderthal sites and the tools they made are always made from local materials.

For example, in the Caucasus there are sites where local Neanderthal tools can be found.

They are always made from local charts.

In the same canyon are modern human remains dated to about the same time, 30,000 years ago, some from local chert, but more, but much of it made from distant obsidian.

And when humans started moving objects in this way, it was proof they were trading between groups.

The history of trade is ten times that of agriculture.

people forget it. People think of trade as modern.

Exchanges between groups have continued for 100,000 years.

And the earliest evidence of that was found in Africa 80,000 to 120,000 years ago, when we witnessed obsidian, jasper, and other objects traveling long distances in Ethiopia.

We also see the shells found by the team here in Oxford migrating 195 miles inland from the Mediterranean Sea in Algeria.

It's evidence that people are starting to interact between groups.

And that leads to specialization.

How do we know that long-distance travel means trade, not migration?

Well, modern hunter-gatherers are like the natives who mined stone axes in a Kalkadoon-owned quarry called Mount Isa.

They traded their stone axes with their neighbors for things like stingray thorns, and as a result stone axes became common in most of Australia.

Therefore, long-distance movement of tools is a sign of trade, not immigration.

What if we cut people off from interaction, cut off their ability to interact and specialize?

The answer is that it not only slows down technological progress, it can actually reverse it.

One example is Tasmania.

When sea levels rose 10,000 years ago and Tasmania became an island, not only did its people progress more slowly than those on the mainland, they actually experienced regression.

With a population of about 4,000, they gave up their ability to make stone tools, fishing gear, and clothing because there weren't enough of them to maintain the expertise needed to sustain their craft.

It feels as if the people in this room have been thrown on a deserted island.

How much of what we have in our pockets will we be able to continue making in 10,000 years?

In Tierra del Fuego, a similar island, with similar people, the same thing did not happen.

This is because Tierra del Fuego is separated from South America by a much narrower straight line, and trade has crossed that straight line for 10,000 years.

Tasmanians are isolated.

Return to this image again and ask yourself not only who made it for whom, but who knew how to make it.

In the case of the stone ax, whoever made it knew how to make it.

But does anyone know how to make a computer mouse?

No one, literally no one.

No one on earth knows how to make a computer mouse.

I want to say this quite seriously.

I don't know the president of the computer mouse company.

He just knows how to run a company.

Assembly line guys don't know because they don't know how to drill oil wells to get the oil out to make plastics and such.

We all know a little bit, but no one knows the whole.

I am, of course, quoting from the famous 1950s economist Leonard Reid's essay, "I, the Pencil," in which he writes about how pencils came to be made, and that no one even knows how to make them, because the people who build them don't know how to mine graphite, they don't know how to cut trees, and so on.

And what we have achieved in human society is that through exchange and specialization, we have created the ability to do things that even we cannot understand.

Language is not the same.

When we use language, we have to communicate ideas that we can understand each other.

But with technology, we can actually do things that are beyond our capabilities.

We are beyond the capabilities of the human mind to an extraordinary degree.

By the way, this is one of the reasons I'm not interested in the I.Q. debate, whether one group has a higher I.Q. than another.

It doesn't matter at all.

What matters to society is not how smart individuals are, but how well people communicate their ideas and how well they cooperate.

So we built something called a collective brain.

We are just nodes in the network.

We are the neurons of this brain.

The exchange of ideas, the meeting and connection of ideas, is driving technological progress step by step.

But bad things can happen too.

And in the future, as we move forward, we will naturally experience terrible things.

There will be war. there will be panic. There will also be natural disasters.

I am absolutely certain that terrible things will happen in this century.

But I also believe that the connections people are making and the ability of ideas to meet and interbreed like never before will advance technology and thus improve our living standards.

Because through the cloud, crowdsourcing, the bottom-up world we have created, a world where everyone, not just the elite, can have their own ideas and meet and connect them, we are definitely accelerating the pace of innovation.

thank you.

(applause)

I am American. So unless it's about players my size colliding at super speed, I basically ignore football.

That said, it's been really hard to ignore football over the past few weeks.

Go to Twitter and you'll find lots of weird words you've never heard before: FIFA, vuvuzela, weird jokes about octopuses.

But what really stresses me out is this phrase that I don't understand: "Cala a boca, Galvao".

If you've been on Twitter in the last few weeks, you've probably seen this.

It has become a big trending topic.

As a monolingual American, I obviously don't know what this phrase means.

So I went to Twitter and asked some people if they could explain 'Cala a Boca, Galbao'.

And luckily my Brazilian friends were more than happy to help.

They explained that the galbao bird is a rare and endangered parrot and is terrifyingly endangered.

Actually, let me talk a little bit more about that.

Narrator: A few words about the galvao, a very rare species of bird native to Brazil.

More than 300,000 galbao birds are killed during carnival parades each year.

Ethan Zuckerman: Clearly, this is a tragic situation, and it's actually much worse.

Galba parrots turned out to be very attractive and not only serve as headdresses, but also apparently have certain hallucinogenic properties. This means that Galbao's abuse has a terrifying problem.

Some sick and perverse people found themselves snorting Galbao.

And it is seriously endangered.

The good news about this is that the international community – also told to me by a Brazilian friend – is stepping up to help.

Lady Gaga has released a new single titled 'Cala a boca, Galvao'. As far as I know, there are actually 5 or 6 new singles out.

And my Brazilian friends told me that just by tweeting the phrase "Cala a boca, Galvao" 10 cents will be donated to a global campaign to save this rare and beautiful bird.

Now, most people realized that this was a prank and was actually a very good prank.

"Cala a boca, Galvao" actually means something completely different.

In Portuguese it means "Galvao, shut up".

And it specifically refers to Lede Globo's chief football commentator, Galbao Bueno.

And what I understand from my Brazilian friend is that this guy is just a corny machine.

He just spouts clichés over and over and can ruin the most interesting matches.

So the Brazilians went to their first match against North Korea, hung up this banner and launched a Twitter campaign, trying to persuade other citizens to tweet the phrase "Cala a Boca, Galbao".

And in fact, it was so successful that it topped Twitter for two weeks.

There are some lessons here. There are several lessons to be learned from this.

And the first lesson, which I think is a worthwhile lesson, is that it's not wrong to ask people to be active online as long as activity simply means retweeting a phrase.

So as long as the activity is simple, it's very easy to escape.

By the way, what this tells us is that there are a lot of Brazilians on Twitter.

There are over 5 million of them.

As a national representative, 11 percent of Brazilian internet users use Twitter.

This is a much higher number than the US and UK.

It is the second most populous country in Japan.

If you've been using Twitter or any other social network and didn't realize it's a space full of Brazilians, you're like most of us.

Because what happens on social networks is that you interact with the people you choose to interact with.

And if you're a big, geeky white American guy like I am, you tend to hang out with a lot of other geeky white American guys.

And you don't necessarily have the feeling that Twitter is actually a very Brazilian space.

And for many Americans, it's very surprising that the space is heavily African-American.

Twitter recently conducted some research.

They turned to the locals.

They believe that 24 percent of Twitter users in America are African-American.

That's almost double the number of African Americans in the population.

Again, this was quite a shock to many Twitter users, but it shouldn't be.

And the reason why you shouldn't do that is because you can always get into trending topics.

And I tend to find topics that are almost entirely African-American conversations.

This is a visualization done by two amazing visualization designers, Fernando Viegas and Martin Wattenberg, who surveyed a weekend's worth of Twitter traffic and found that many of these trending topics are essentially isolated conversations, and they do it in unexpected ways.

Oil spills turned out to be mostly white conversations and soup kitchens were mostly black conversations.

And the cool thing about this is that if you want to confuse who you see on Twitter, it's literally a quick click away.

Click on that cooking tag and you'll see a completely different conversation with different people participating.

But generally speaking, most of us don't.

We end up in what my friend Eli Palliser calls a filter bubble, where we see people we already know and people who look like people we already know.

And we tend not to see the big picture.

Well for me this was a surprise. Because this wasn't what the internet was supposed to be.

Back in the early days of the internet, when cyber utopians like Nick Negroponte were writing big books like Being Digital, it was predicted that the internet would be an incredibly powerful force to smooth out cultural differences and put us all in some common realm of fashion.

Negroponte begins the book with a story about how difficult it is to build connections in the atomic world.

He attends a technology conference in Florida.

And he sees something really, really ridiculous, which is a bottle of Evian water on the table.

And Negroponte says this is funny.

This is the old economy.

The economics of moving these heavy and slow atoms over long distances are very difficult.

We're headed for a future of bits where everything is speedy and weightless.

It can be anywhere in the world at any time.

And it will change the world as we know it.

Well, Negroponte was right in many ways.

He is completely wrong about this.

It turns out that atoms are often much more mobile than bits.

Walk into a store in the US and you can very easily buy water bottled in Fiji and shipped to the US at great cost.

It is actually surprisingly difficult for me to watch Fijian feature films.

It's really hard for me to listen to Fijian music.

It's very difficult for me to get news about Fiji, but strangely enough, there is actually a lot going on in Fiji.

A coup government was established. We have a military government.

There is a crackdown on the media.

In fact, it may be the place that deserves the most attention right now.

Here's what I'm thinking.

I think we tend to focus on the infrastructure of globalization.

We look at the frameworks that enable us to live in this connected world.

And it is a framework that includes airline routes and so on.

This includes things like internet cables.

Looking at a map like this, the whole world looks flat because everything is one or two hops away.

You can catch a flight in London or arrive in Bangalore later today.

Two hops away, you'll be in Suva, the capital of Fiji.

It's okay there.

When we start looking at what's actually flowing on these networks, we see a completely different picture.

When you start observing how plane flights move around the world, you suddenly realize that the world isn't even close to being flat.

Very lumpy.

There are parts of the world that are very well connected.

Basically, there is a huge corridor in the sky between London and New York.

But look at this map. You can keep watching this for 2-3 minutes.

You don't see many planes flying from South America to Africa.

And you will notice that parts of the earth are systematically clipped.

When we stop focusing on the infrastructure that makes connectivity possible and look at what's really going on, we begin to realize that the world doesn't work exactly the way we think it does.

There is a problem that has interested me for the last ten years.

In fact, the world is becoming more and more global.

It's getting more and more connected.

Many of the problems are global.

More of our economy is global.

And our media is becoming less globalized by the day.

If you were watching TV broadcasts in the United States in the 1970s, 35 to 40 percent of them would have been international news with new broadcasts each night.

It reduces to about 12-15 percent.

And this tends to give us a very distorted view of the world.

Here's a slide from Alisa Miller's previous TED talk.

Alisa is the president of Public Radio International.

And she created a cartogram. It's basically a distorted map based on what an American TV newscaster looked up over the course of a month.

And when we warp the map based on our attention, we find that the world in American television news is basically reduced to this giant, bloated America.

And some other countries we invaded.

And that's basically what our media is for.

And before you conclude that this is just a feature of American TV news, it's terrifying, and I agree it's terrifying, but I've been mapping elite media outlets like the New York Times, and I've found the same thing.

If you look at the New York Times or look at other elite media, what you mostly get are pictures of very wealthy countries and countries that we have invaded.

It turns out that new media doesn't always help us that much.

This is a map made by Mark Graham near the Oxford Internet Institute.

This is a geocoded Wikipedia article map.

And we can see that there is a very large skew in North America and Western Europe.

Even within Wikipedia, where we create our own content online, there is a great deal of bias towards where many Wikipedia authors are based rather than other parts of the world.

In the UK, after this session, you can get up and pick up your computer and read an Indian, Australian or Canadian newspaper, but in the US it's forbidden.

Probably not.

Looking at online media consumption (in this case, the top 10 Internet users), more than 95 percent of news readers come from national news sites.

This is one of those rare cases where the US is actually marginally better than the [UK]. Because we actually like reading British media, not the other way around.

All this led me to wonder if we were in what I call an imagined cosmopolitanism.

we look at the internet

I think we can see the earth widely.

We come across Chinese pages from time to time and decide they actually have the best technology ever built to connect us with the world.

And most of the time we forget that we're checking Boston Red Sox scores.

So this is a real problem — not just because the Red Sox are having a bad year this year — because, as we are discussing here at TED, the real problems of the world, the interesting problems to solve, are global in scale and scope, and global solutions require global conversations.

This is the problem we have to solve.

Good news there.

For six years I have been dating these people.

The group is called Global Voices.

We are a team of bloggers from all over the world.

Our mission was to fix the world's media.

We started in 2004.

As you may have noticed, it hasn't worked so well so far.

I also don't think we can actually solve the problem on our own.

But the more I think about it, the more I think some of the things we've learned along the way are interesting lessons about how to rewire the web if you want to have a wider world.

The first thing to consider is that there is a dark side to the world when it comes to attention.

In this case, NASA's map of the world at night is literally pitch black due to the lack of electricity.

And I was thinking that the dark spots on this map basically meant I couldn't get media from there because I had more basic needs.

What I'm starting to realize is that while it's possible to get media, it's a huge amount of work and requires a huge amount of encouragement.

One such dark spot is Madagascar. This country is better known for its DreamWorks movies than it is for the lovely people who actually live there.

So those who founded the Foco Club in Madagascar were not really interested in trying to change their country's image.

They were doing something simpler.

It was a club for studying English and learning about computers and the Internet.

But what happened was a violent coup in Madagascar.

Most independent media were shut down.

And the high school students who were learning to blog through the Foko Club suddenly found themselves talking to a global audience about the protests, the violence and everything that was going on in this country.

So a very small program meant to get people in front of their computers, put their thoughts out there, and publish an independent media outlet ended up having a huge impact on what we know about this country.

Now, the point here is that most people here probably don't speak Malagasy.

Also, I'm afraid most of you can't even speak Chinese. It's kind of sad considering it's the most used language on the internet right now.

Fortunately, people are trying to find ways to fix this.

If you use Google Chrome and visit a Chinese site, you will notice this very cute box at the top. This box will automatically detect that the page is in Chinese and with a click of the mouse you will immediately see the translation of the page.

Unfortunately this is a machine translation of the page.

Google is very good at some languages, but it's actually pretty bad at Chinese.

And the results can be very interesting.

What you really want, what I really want, is eventually the ability to press a button to queue this and allow a human to translate this.

If you think this is silly, it's not.

Now there is a group called Yeeyan in China.

Yeeyan is a group of 150,000 volunteers who go online every day.

They are looking for the most interesting content in English.

They translate around 100 articles daily from major newspapers and major websites.

They put it online for free.

It was the project of a man named Zhang Lei, who lived in the United States during the Lhasa riots, but he couldn't believe how biased the American media was.

And he said, ``If there is one thing I can do, it is to start translating so that people in both countries can understand each other a little more.''

So the question for you is, if Yeeyan can line up 150,000 people to translate the English Internet into Chinese, where is the English Yeeyan?

Who is going after the Chinese, who now have 400 million Internet users?

My guess is that at least one of them said something interesting.

So even if you find a way to translate from Chinese, there is no guarantee that you will find it.

There are basically two strategies when we look for information online.

We use search a lot.

Search is very useful when you know what you are looking for.

But if what you're looking for is an accidental discovery, or you just want to stumble upon something you didn't know you needed, our main philosophy is to look to social networks and find friends.

what are they looking at? Maybe we should consider it.

The problem with this is that essentially what you end up with after a while is the wisdom of the herd.

You'll probably meet a lot of people who are similar to you and who have similar interests.

And it is very difficult to get information from other herds and other parts of the world where people gather and discuss their interests.

To do this, at some point you need someone to drive you out of your flock to another.

I need a guide.

This is Amira al-Husayni. She is the Middle East editor for Global Voices.

She has one of the toughest jobs in the world.

Not only does she have to keep Israeli and Palestinian contributors from killing each other, she needs to understand what interests you about the Middle East.

And in the sense of trying to throw you off your normal trajectory, and of trying to bring your attention to the story of someone who quit smoking during the month of Ramadan, she must know something about her global audience.

She should know something about what stories are available.

Basically, she's a deejay.

She is a skilled human curator who knows the material she has available to her, who can listen to her audience, make choices, and move people forward in some way.

I don't think this is necessarily an algorithmic process.

I think the great thing about the internet is that it actually makes it much easier for deejays to reach a wider audience.

I know Amira.

I can ask her what to read.

But thanks to the internet, she's in a position to tell many people what to read.

And if this is something you're interested in expanding your own web, you can also listen to her.

So once you start expanding your scope in this way, once you start lighting your voice in a dark place, you start translating, you start curating, you end up in some really weird places.

This is an image from my favorite blog, AfriGadget.

and AfriGadget, a blog that looks at technology in an African context.

Specifically, it features a blacksmith in Kibera, Nairobi, turning a Land Rover shaft into a cold chisel.

And when you look at this image, you might think, "Why should I care about this?"

And to tell you the truth, this guy could probably explain this to you.

Eric Huisman. You may have seen him around the conference.

He is nicknamed the White African.

He's a very famous American geek, but he's also Kenyan. He was born in Sudan and raised in Kenya.

He's a go-between.

He's literally stepping into both worlds: the world of the African tech community and the world of the American tech community.

So he was able to tell a story about a Kibera blacksmith and turn it into a story about reusing technology, innovating from constraints, and seeking inspiration based on reusing materials.

He knows one world and finds ways to communicate it to another. Both worlds have a deep connection.

I'm fairly confident that these bridging numbers show us the future of using the web to make the world wider.

But the whole point of bridges is that you eventually need someone to cross them.

And from there we start talking about heterosexuals.

So if I was in the NFL, I'd spend the offseason tending to wounds, having fun at home, etc., and maybe recording a hip-hop album.

Cincinnati Bengals middle linebacker Dhani Jones has a slightly different approach to the offseason.

Dhani has a TV show.

Its name is "Dani Tackles the Glove".

And every week in this TV show, Dhani travels to another country in the world.

He found a local sports team.

He trains with them for a week and plays with them.

The reason is not only that he wants to master Muay Thai boxing.

For him, sports are a language for encountering the vastness and wonder of the world.

For us it may be music. For us it could be food.

For many of us it may be literature or writing.

But there are all different techniques that allow you to go out and see the world and find your place in it.

The purpose of my talk here is not to persuade the people in this room to accept your xenophobia.

Given that you attend a conference called TEDGlobal, my guess is that most people are foreign patriots whether you use the term or not.

My challenge instead is this.

It is not enough to personally decide that you want a wider world.

We need to figure out how to rewire the systems we have.

We have to fix the media.

I have to fix the internet. We have to fix our education.

We have to fix immigration policy.

We need to consider how to create serendipity, how to popularize translation, and find ways to embrace and celebrate these bridge-builders.

And we need to find a way to cultivate good foreigners.

that's what i'm trying to do. i need your help.

(applause)

I am a storyteller.

That's what I do in life, telling stories and writing novels. And today I want to share some stories about the art of storytelling and supernatural creatures called jinni.

But before we go there, let me tell you a little bit of my personal story.

Of course, I will speak not only with words, but also with the geometric shape of a circle, so I am sure you will come across several circles throughout my talk.

I was born in Strasbourg, France to Turkish parents.

Soon after, my parents divorced and I came to Turkey with my mother.

Since then, I was raised as an only child by a single mother.

In Ankara in the early 1970s, that was a bit of a rarity.

I grew up in a patriarchal environment, seeing my mother as a divorcee, because our neighborhood was mostly large families and my father was the head of the household.

In fact, I grew up observing two different types of women.

On the one hand, my mother was a well-educated, worldly, modern and Westernized Turkish woman.

On the other hand, my grandmother also took care of me, but was more spiritual, less educated and decidedly less rational.

This was the woman who read coffee grounds to foresee the future and melted lead to create mystical shapes to ward off the evil eye.

There were many people who came to visit my grandmother, such as those with severe acne on their faces and warts on their hands.

Each time, my grandmother said something in Arabic, took a red apple and pricked it with as many rose thorns as there were warts she wanted to remove.

She then surrounded these spines one by one with dark ink.

One week later, the patient returned for a follow-up examination.

Now, I know I shouldn't say such things in front of an audience of scholars and scientists, but the fact is that not a single person who visited my grandmother for skin conditions left unhappy or uncured.

I asked her how she did this. Was it the power of prayer?

To which she said, "Yes, prayer works, but beware of the power of the circle."

I learned one very valuable lesson from her, among many others. That is, if you want to destroy something in this world, be it a pimple, a scar, or the human soul, all you have to do is surround it with thick walls.

The inside will dry out.

Now we all live in some kind of social and cultural circle.

Everyone thinks so.

We are born into a particular family, nation and class.

But without any connection to the world beyond the world we take for granted, we too are in danger of becoming withered inside.

Our imagination may be atrophied. Staying too long in a cocoon of culture can weaken our minds and wither our humanity.

If all the people in our inner circle - our friends, neighbors, co-workers, family - are similar to us, it means that we are surrounded by mirror images of ourselves.

Now, another thing women like my grandmother do in Turkey is cover mirrors with velvet or hang them on the wall with their backs facing out.

This is an old Eastern tradition based on the knowledge that it is not healthy for humans to spend too much time staring at themselves.

Ironically, living in a community of like-minded people is one of the greatest dangers in today's globalized world.

And it happens everywhere: liberals and conservatives, agnostics and believers, rich and poor, East and West.

We tend to form clusters based on similarities and then create stereotypes about other people's clusters.

In my opinion, one way to transcend these cultural ghettos is through the art of storytelling.

Stories cannot destroy the frontier, but they can punch holes in our mental walls.

And through that hole we get a glimpse of the other, and sometimes even like what we see.

I started writing novels at the age of eight.

One day my mother came home with a turquoise notebook and asked if I would be interested in keeping a personal diary.

In retrospect, I think she was a little worried about my sanity.

I used to tell stories all the time at home, which was good, but I told it to my imaginary friends around me, and it wasn't very good.

Since I was an introverted kid who used colored crayons to communicate and apologized when I bumped into things, my mother thought it might be helpful to write down my daily experiences and emotions.

What she didn't know was that I was so bored with my life that I never wanted to write about myself.

Instead, I started writing about other people and things that didn't really happen.

Thus began my lifelong passion for novel writing.

So from the beginning, fiction for me was less an autobiographical expression, and more a transcendental journey into other lives, into other possibilities.

Please bear with me as I draw a circle and come back to this point.

Well, another thing happened at the same time.

My mother became a diplomat.

So, from this small, superstitious middle-class neighborhood where my grandmother lived, I ended up zooming into this posh international school [in Madrid], where I was the only Turk.

It was here that I first met a so-called "representative foreigner."

Our classrooms had children of all nationalities, but this diversity did not necessarily result in an international, egalitarian classroom democracy.

Instead, it created an atmosphere that saw each child not as an individual in their own right, but as representatives of something larger.

We were like a miniature United Nations, and we had fun except when something negative happened about our nations and religions.

The child who represented it was ridiculed, ridiculed and bullied endlessly.

And I should know because while I was in that school there was a military takeover in my country, gunmen of my nationality nearly killed the Pope, and Turkey scored zero points in the Eurovision Song Contest.

(laughs) I used to skip school and my dream was to become a sailor.

I also experienced cultural stereotypes for the first time there.

Other children asked me about a movie they hadn't seen yet, "Midnight Express." They asked me how many cigarettes I smoke a day. I thought all Turks were heavy smokers. It also made me wonder at what age I would start hiding my hair.

I learned that the three main stereotypes about my country are politics, tobacco and veil.

After Spain we went to Jordan, Germany and Ankara again.

I felt that my imagination was the only suitcase I could take with me wherever I went.

Stories gave me a sense of the three big Cs that I otherwise lacked: centrality, continuity, and coherence.

In my mid-twenties, I moved to Istanbul, the city of my dreams.

I live in a very vibrant and diverse neighborhood where I have written several novels.

I was in Istanbul in 1999 when the earthquake hit.

Something seemed to stop me as I rushed out of the building at 3am.

There was a local grocery store - a grumpy old man who didn't sell liquor and didn't talk to the socially vulnerable.

He sat next to a transvestite with a long black wig and mascara down her cheeks.

I saw the man open a packet of cigarettes with trembling hands and offer her one. That's the image of the earthquake night in my head right now. A conservative grocer and a weeping transvestite smoking a cigarette together on the sidewalk.

In the face of death and destruction, our mundane differences melted away and we were all one, even if it was just for a few hours.

But I have always believed that stories have a similar effect on us.

I wouldn't say fiction has the scale of an earthquake, but when we're reading a good novel, we leave our small, cozy apartments behind, go out into the night alone, and start making friends with people we've never met before, and perhaps even had prejudices.

Soon after, I attended a women's college in Boston and then Michigan.

I experienced this more as a linguistic change than a geographical change.

I started writing novels in English.

I am not an immigrant, a refugee, or an asylum seeker. People ask me why I do this, but crossing between languages ​​gives me the opportunity to reinvent myself.

I love writing in Turkish. Turkish is very poetic and very emotional for me. Also, I love writing in English. English is very mathematical and intellectual for me.

As such, I feel connected to each language in a different way.

Today, like millions of other people around the world, English is an acquired language for me.

If you are a latecomer to the language, what happens in it will live with ongoing and permanent frustration.

As latecomers, we always want to say more, tell better jokes, say better things, but we end up saying less because of the gap between our hearts and our words.

And the gap is so scary.

But if you can live through it without fear, it can also be inspiring.

Here's what I discovered in Boston. That frustration was very exciting.

At this stage, my grandmother, who had been anxiously watching the course of my life, began incorporating my hasty marriage into her daily prayers so that I could settle down once and for all.

And God loves her, so I got married.

(Laughter) But instead of settling down, we went to Arizona.

And since my husband is in Istanbul, I now commute between Arizona and Istanbul. Two places on the surface of the earth that could not be more different.

I think part of my mind has always been a nomad, both physically and mentally.

Stories cling to me, holding my pieces and memories together like existential glue.

But as much as I love stories, these days I'm starting to wonder if stories lose their charm when they're seen as more than just stories.

This is a theme that I would like to think about together.

When my first novel written in English was published in America, I heard an interesting remark from a literary critic.

"I liked your book, but I wish you had written it differently," he said.

(laughter) I asked him what that meant.

He said, "Look, there are a lot of Spanish, American, Hispanic characters, but there is only one Turkish character, and it's a man."

Now, since the novel is set on a college campus in Boston, it was more common for me to see multinational characters than Turkish characters, but I could see what the critics were looking for.

And I also knew that I would continue to let him down.

He wanted to see my identity manifested.

He was looking for a Turkish woman in the book because I happened to be the woman.

We often talk about how stories change the world, but we should also look at how the world of identity politics influences the way stories are distributed, read, and reviewed.

Many writers feel this pressure, but non-Western writers feel it more.

If you are a female writer from the Muslim world like I am, you are expected to write the story of a Muslim woman, preferably an unhappy story of an unhappy Muslim woman.

You are expected to write informative, moving, and distinctive stories, leaving the experimental and avant-garde to your Western colleagues.

What I experienced as a child in that school in Madrid is happening in the literary world today.

Writers are not seen as creative individuals themselves, but as representatives of their respective cultures. Some are from China, some are from Turkey, some are from Nigeria.

We are all supposed to have something very distinctive, if not singular.

Writer and commuter James Baldwin was repeatedly questioned about homosexuality in a 1984 interview.

When an interviewer tried to classify him as a gay writer, Baldwin stopped and said: "But don't you see? There is nothing in me that is not in another, and nothing that is in another that is not in me."

When identity politics tries to label us, it is the freedom of our imagination that is at stake.

There is a vague category called multicultural literature that lumps all non-Western writers together.

I will never forget my first multicultural reading at Harvard Square about ten years ago.

We were three writers, one Filipino, one Turkish and one Indonesian. It seems like a joke.

(Laughter) And the reason we got together wasn't because we had a shared artistic style or literary taste.

It was all because of our passports.

Multicultural writers are expected to tell real stories, not fictional stories.

Functions are attributed to fiction.

In this way, not only the writer himself, but also the fictional character becomes a representative of something greater.

But I must add right away that the tendency to see stories as more than just stories did not come only from the West.

it comes from anywhere.

And I experienced this firsthand in 2005 when I was put on trial for words uttered by a fictional character in a novel.

I wanted to write a constructive, multi-layered novel about an Armenian-Turkish family through the eyes of a woman.

My micro story became a macro problem when I was indicted.

Some people criticize me for writing about the Turkish-Armenian conflict, others admire me.

But there were times when I wanted to remind both sides that this was fiction.

It was just a story.

And when I say "just a story," I don't mean to disparage my work.

I want to love and admire fiction for what it is, not as a means to an end.

Writers have the right to express their political opinions, and good political fiction exists, but the language of the novel is not the language of everyday politics.

Chekhov said, "The solution to a problem and the correct way of posing it are two very different things.

And only the latter is the responsibility of the artist. ”

Identity politics divide us. Fiction connects.

People are interested in overarching generalizations.

Another is nuance.

People draw boundaries.

The other does not recognize borders.

Identity politics are made of solid bricks.

Fiction is a stream of water.

During the Ottoman Empire, there were traveling storytellers called meddas.

They would go to coffee houses where they would tell stories in front of an audience, often improvising.

Whenever a new character appeared in the story, Medda would change his voice and impersonate that person.

Anyone could go and listen, ordinary people, Sultans, Muslims, even non-Muslims.

Like "The Tale of Nasreddin Hodja", the stories unfolded across borders and were very popular throughout the Middle East, North Africa, the Balkans and Asia.

The story continues across borders.

When Palestinian and Israeli politicians speak, they usually don't listen to each other, yet sometimes Palestinian readers read novels by Jewish authors and vice versa, connecting and empathizing with the narrator.

Literature must let us go beyond.

If it doesn't get us there, it's not good literature.

Books saved me from being an introverted, shy kid. I used to be like that too.

But I also recognize the dangers of fetishizing them.

When the poet and mystic Rumi met his spiritual companion Shams of Tabriz, one of the first things Shams did was throw Rumi's book into the water and watch the letters dissolve.

The Sufis say, "Knowledge that cannot go beyond oneself is far worse than ignorance."

The problem with today's cultural ghetto is not a lack of knowledge, we know or think we know each other well, but knowledge keeps us from being above ourselves, making us elitist, alienating and isolating.

There is a metaphor that I love. It is to live like a drawing compass.

As you know, one leg of the compass is stationary and rooted in a certain place.

The other leg, on the other hand, makes a wide circle and is in constant motion.

The same goes for my novel.

Some of it is rooted in Istanbul and has strong Turkish roots, while others have traveled around the world and connected with different cultures.

In that sense, I like to think of my novels as local and universal, here and everywhere.

Anyone who has visited Istanbul has seen the Topkapi Palace, the residence of the Ottoman Sultans for over 400 years.

Inside the palace, just outside your favorite concubine, is an area called the Djinn's Assembly Hall.

It's between buildings.

I was intrigued by this concept.

We usually don't trust the realm between things.

We see them as the realm of supernatural creatures like jinn. The gin is made of smokeless fire and is a symbol of the elusive.

But what I want to say is that perhaps the elusive space is what writers and artists need most.

When I write novels, I value elusiveness and volatility.

I like not knowing what will happen after 10 pages.

I like my characters to surprise me.

I may write about a Muslim woman in one novel, and it will probably be a very happy story, and in the next book I may write about a handsome gay professor in Norway.

We can write anything that comes from our hearts.

Audrey Lorde once said, "White fathers taught me to say, 'I think, therefore I am,'" suggesting, "I feel, therefore I am free."

I think it was a great paradigm shift.

Nevertheless, why are today's creative writing courses teaching students to "write what they know" in the first place?

Perhaps that's not the right way to start in the first place.

Imaginary literature is not necessarily about writing who we are, what we know, or what our identities are.

We should teach young people and ourselves to open our minds and write what we feel.

We should get out of our cultural ghetto and visit the next place and the next place.

After all, the story moves like a whirling monastery, circles over circles.

They unite all of humanity regardless of identity politics, and that's good news.

And I would like to end with an old Sufi poem. "Let's be friends once. Let's make life easier. Let's be lovers, let's be loved. Don't leave the earth to anyone."

thank you.

Chris Anderson: Julian, welcome.

WikiLeaks has reportedly released more classified documents in recent years than any other media in the world combined.

Is it true?

Julian Assange: Yeah, is that true?

That worries you, right? -- that the rest of the world's media is doing such a bad job that a small group of activists can publish more of that kind of information than the rest of the world's media combined.

CA: How does it work?

How do people publish documents?

And how do you protect their privacy?

JA: So they are -- as far as we know -- classic whistleblowers, and there are several ways they can get information to us.

So we use this state-of-the-art encryption to bounce information across the internet, hide its tracks, and pass it through jurisdictions like Sweden and Belgium to enact legal protections.

We get information by mail, encrypted or not, scrutinized and formatted it like a regular news outlet, and when we are talking about a huge database of information, which is sometimes very difficult, we make it available to the public and protect ourselves from inevitable legal and political attacks.

CA: So you're striving to make sure the document is legitimate, but you have little idea who the source actually is?

JA: Yes, yes. We rarely know, and if we do at some stage, we destroy that information as soon as possible.

(phone rings) Oh my god.

(Laughter) CA: I think the CIA is asking for a TED membership code.

(Laughter) So let's actually give an example.

This was leaked a few years ago.

Please update this document...

This is from Kenya several years ago.

Can you tell us what you leaked and what happened?

JA: This is the crawl report.

This was a secret intelligence report commissioned by the Kenyan government after the 2004 elections.

Prior to 2004, Kenya was ruled by Daniel Arap Moi for about 18 years.

He was a soft-hearted dictator in Kenya.

And when Kibaki came to power through a coalition of forces trying to clean up Kenya's corruption, they commissioned this report and spent about £2 million on it and related reports.

And the government took advantage of that, using its political influence over Moi, Kenya's richest man. Moi is still the richest person in the world.

It is the holy grail of Kenyan journalism.

So I went there in 2007 and managed to get hold of this material just before the election, that is, just before the December 28th national election.

We released the report three days after new President Kibaki decided to partner with the man he was about to wipe out, Daniel Arap Moi, so the report became a dead albatross around Kibaki's neck.

CA: So, in short, the content of the report leaked to Kenya indirectly, not through the official media, and in your opinion it actually moved the election.

JA: Yes. So it made the front page of The Guardian and was later printed in press in neighboring countries of Kenya, Tanzania and South Africa.

And it came in from outside.

And a few days later, the Kenyan press felt comfortable talking about it.

And according to a Kenyan intelligence report, the show, which aired on Kenyan television for 20 nights in a row, caused a 10 percent swing in voting results that changed the outcome of the election.

CA: Wow, so your leak really changed the world?

JA: Yes.

(Applause) CA: Here it is -- I'm going to show you a short clip of this Baghdad airstrike video.

The video itself is long, but here's a short clip.

This is -- this is intense, so I warn you.

Radio: ... fuck, just pop it open.

Your team seems to be taking, um, four Humvees...

It's very clear. have understood. Fired.

Please let me know when you get it. let's shoot

Set everyone on fire.

Come on, fire up!

(Machine gun fire) Keep shooting. keep shooting.

(Machine gun fire) Keep shooting.

Hotel... Bushmaster Two-Six, Bushmaster Two-Six, I need to move, NOW!

Alright, I just got involved with all eight of them.

Yeah, I see two birds [helicopters] and we're still firing.

Roger. understood.

Two-Six, this is Two-Six, on the move.

I'm sorry. what was going on?

Damn Kyle. Okay, hahaha. I beat them

CA: So what are the implications?

JA: The impact on the people involved in it was severe.

We ended up sending two people to Baghdad to investigate the story further.

So this is just the first of three attacks that occur in that scene.

CA: So 11 people were killed in that attack, including two Reuters employees?

JA: Yes. Two Reuters employees and two infants were injured.

A total of 18 to 26 people were killed.

CA: And publicizing this caused widespread outrage.

What do you think was this key factor that actually caused the outrage?

JA: I don't know. I think people understand the huge disparity in military strength.

As the men leisurely walk down the street, an Apache helicopter rises one kilometer away and, looking for any excuse, fires 30mm shells at everyone, killing those trying to rescue the wounded.

And although there were two journalists involved, they clearly weren't rebels because that's what they do.

CA: So Bradley Manning, a U.S. intelligence analyst, was arrested, and he allegedly confessed in a chat room to leaking this video and 280,000 classified U.S. embassy telegrams.

I mean, was he?

JA: We refused to receive those cables.

About five days ago, he was charged with obtaining 150,000 cables and releasing 50 of them.

Well, earlier this year we published a telegram from the US Embassy in Reykjavik, which is not necessarily connected.

So I was known as a visitor of that embassy.

CA: I mean, if you received thousands of US Embassy diplomatic cables...

JA: We would have released them. (CA: Would you?) JA: Right. (CA: Why?) JA: Well, because this sort of thing reveals what the real state of Arab governments, for example, is, what the real human rights violations in those governments are.

If you look at declassified cables, such material exists.

CA: So let's talk about this a little more broadly.

So, in general, what is your philosophy?

Why is it right to encourage leaks of sensitive information?

JA: Well, there is the question of what information is important in the world and what information can achieve change.

And there is a lot of information.

So information that an organization is spending financial effort to hide is a very good indication that there is hope that the information will have some effect when it gets out. Because the organizations that know it best and know it inside out are going to great lengths to keep it hidden.

And that's what we really discovered, that's the history of journalism.

CA: But is there a risk that a leak could actually have unintended consequences, for the individuals involved, or for society at large?

JA: I haven't seen anything in what we've released.

In short, we have a harmful vaccination policy.

We have ways of dealing with personal information, information that contains personally identifiable information.

But there is a good secret. You know, the record with the doctor. It's a good secret, but we're dealing with some really motivated whistleblowers who come forward.

CA: So they are highly motivated.

And, for example, what would you say to a parent whose son is in the US military? he says: "You put out something that someone else has a reason to put out.

It depicts an American soldier laughing as people die.

That's what made and has given millions of people around the world the impression that American soldiers are inhumane.

Not really. my son is not. How can you do that? "

What would you say to that?

JA: Yes, there are many.

But remember, people in Baghdad, people in Iraq, people in Afghanistan don't have to watch the video. they see it every day.

Therefore, their opinion does not change. It's not going to change their perception.

That's what they see every day.

It will change the perceptions and opinions of those paying it all, and that is our hope.

CA: So you've found a way to shed light on these kinds of dark secrets of corporations and governments.

the light is good

But do you think there's any irony in the fact that you yourself have to keep secrets around your sources in order to shine that light?

JA: It's not. So there is not a single WikiLeaks dissident yet.

There are no dissident sources in other sources.

It would be difficult for us if they came forward, but perhaps we are acting in such a way that people feel they must continue our mission rather than morally undermining it.

CA: I'm actually curious, based on what we've heard so far, I'm interested in what the TED audience thinks.

You know, there might be some views on WikiLeaks and Julian.

Heroes, heroes of the people, bring this important light.

A dangerous troublemaker.

Who has a hero's point of view?

Who has the view of a dangerous troublemaker?

JA: Oh, come on. There should be several.

CA: Soft crowd, Julian, soft crowd.

I have to work harder. Let me show you another example.

I'm here to tell you that you haven't leaked yet, but I think you've leaked about TED.

I mean, this is an interesting story that just happened, right?

What is this?

JA: This is a sample of what we do every day.

Late last year -- last November -- Albania experienced a series of well explosions, similar to those in the Gulf of Mexico, but on a smaller scale.

And then we got a report -- a sort of engineering analysis of what happened -- that said that security guards from various competing oil companies actually parked their trucks there and blew them up.

And part of the Albanian government was involved in this, and so on.

And nothing was written in the engineering report, which was a very difficult document for us.

I couldn't verify it because I didn't know who wrote it or what it was about.

So we were a little skeptical that a competing oil company was fabricating the problem.

So on that basis, we put it out there and said, 'Look, we're skeptical about this.

I don't know, what can I do?

The material looks good and feels right, but I can't verify that. ”

And I got a letter this week from the company that wrote it, wanting to track down the source -- (laughter) saying, "I'd like to track down."

And we were like, 'Oh, tell me more.

Which document exactly are you talking about?

Can you prove that you had legal authority over the document?

is it really yours? ”

So they sent us this screenshot with the author listed by Microsoft Word ID.

yes.

(Applause.) But that often happened.

This is similar to how one way to identify and verify what the material is is to have them write to you.

CA: Yes. Was there any information from inside BP?

JA: Yes, there are a lot, but I mean, at the moment, we're doing some kind of serious funding and engineering effort.

So the publishing pace has been minimal over the past few months while we redesign our back system for the tremendous public good.

That's a problem.

So, like any growing startup organization, we are overwhelmed by the growth. What this means is that we receive a lot of very high-level whistleblowing information, but we don't have enough people to actually process and scrutinize this information.

CA: So basically the funding of journalist volunteers and journalist salaries is the main bottleneck?

JA: Yes. Yes, and trustworthy people.

So we're a tough organization to grow fast because of what we're dealing with, so we need to reorganize to have the talent to deal with the highest national security issues and then the lower security issues.

CA: So let me understand a little bit about you personally and how you came to do this.

I remember reading it as a kid, you went to 37 different schools.

is that correct?

JA: Well, my parents were in the film industry and then on the run from a cult, so the combination...

(Laughter) CA: So psychologists might say it's a recipe for paranoia.

JA: Huh, the film industry?

(Laughter) (Applause) CA: And you, I mean, you were a hacker when you were a kid, and you ran into the authorities early on.

JA: Well, I was a journalist.

As you know, I was active as a journalist activist from an early age.

I wrote a magazine when I was a teenager and was indicted for it.

Therefore, hackers should be careful.

This means that there are methods that can be deployed for different uses.

Unfortunately, at the moment it is mostly deployed by the Russian Mafia to steal the old lady's bank account.

So the phrase isn't as good as it used to be.

CA: Well, I certainly don't think you're stealing someone's grandma's bank account, but what are your core values?

Can you tell us what they are and the events in your life that helped determine them?

JA: I'm not sure about that incident.

But the core value is that capable and generous men don't create victims. They raise their victims.

And it's from my father, and from other talented and generous people who have been involved in my life.

CA: Competent and generous men don't make victims. Do they raise victims?

JA: Yes. You know, I'm a belligerent person, so I'm not really into nurturing that much, but one way or another, there's another way to nurture the victim. It's about policing perpetrators of crime.

And it has been in my character for a long time.

CA: So, at the last minute, tell me the story right away. what happened in Iceland?

Basically, I published something there, ran into trouble with the bank, and then the news agency there stopped publishing the article.

Instead, they promoted your side.

It has made you very popular in Iceland. What happened next?

JA: Yeah, this is a great case.

Iceland went through this financial crisis.

It suffered more than any other country in the world.

The GDP of its banking sector was ten times that of other economic sectors.

Anyway, we released this report last July.

And the national television station got an injunction five minutes before it went on air, just like a movie. The injunctions hit the news desks and news readers were like, "This has never happened before. What am I going to do?"

Well, all the while we're just showing the website as a glue instead. And we became very famous in Iceland and went to Iceland to talk about this issue.

And there is a feeling within the community that such a thing should never happen again, and as a result, we have worked with Icelandic politicians and other international legal experts to put together a new kind of bill to make Iceland an offshore haven for press freedom, with the strongest journalistic protections in the world, and a new Nobel Prize for free speech.

Iceland is a Nordic country, so you can use this system as well as Norway.

And just a month ago, this was unanimously passed by the Icelandic parliament.

CA: Wow.

(Applause) Last question, Julian.

So when you think about the future, do you think Big Brother is likely to become more controlling and more secretive, or do you think it's more likely that we'll be watching over Big Brother, or it will just roll one way or the other?

JA: I don't know which way to go.

So there is a lot of pressure to harmonize free speech and transparency laws around the world, within the EU, between China and the US.

Which one should we go for? It's hard to see.

That is why this is a very interesting time. Because with very little effort you can turn the situation in one direction or the other.

CA: Well, Julian, it seems to echo the audience's opinion: take care and do your best for yourself.

JA: Thank you Chris. (CA: Thank you.) (Applause)

In October 2010, Justice League of America partners with The 99.

Icons like Batman, Superman, Wonder Woman and friends will team up with Jabbar, Noora, Jami and friends.

This is a story of cross-cultural crossroads, and what better group to have this conversation than the groups that emerged from their respective histories and regions fighting fascism?

When fascism swept Europe in the 1930s, there was an unexpected reaction from North America.

As Christian iconography changed and the swastika was made out of the cross, Batman and Superman were made by Jewish youth in the United States and Canada, also going back to the Bible.

Think about it this way. All superheroes don't have parents, just like the prophets.

Superman's parents died on Krypton before he was one year old.

Batman Bruce Wayne lost his parents in Gotham City when he was six years old.

Spider-Man was raised by his uncle and aunt.

And all of them receive messages from heaven, just as prophets receive messages from God through Gabriel.

When Peter Parker was in a library in Manhattan, a spider came down from above and bit him to deliver a message.

A large bat flew overhead while Bruce Wayne was in his bedroom. He took it as a precursor to becoming Batman.

Not only will Superman be sent to Earth from Heaven or Krypton, but he will be sent in a pod, just like Moses was on the Nile.

(Laughter.) And he hears his father, Jor-El, telling the Earth: "I sent you my only son."

(Laughter) (Applause) These were clearly biblical archetypes, and the idea behind them was to create positive, globally resonant storylines that others could tie to the same eliciting spiteful messages. Because those who use religion for the wrong purposes only become villains with a bad message.

And only by connecting the positive can the negative be separated.

That's how The 99 was born.

The 99 refers to the 99 attributes of Allah in the Quran, and dozens of other attributes that no one in the world would agree with, such as Generosity, Mercy, Foresight, Wisdom.

It doesn't matter what your religion is. Even if you're an atheist, you wouldn't raise your kids to tell them to lie three times a day.

They are basic human values.

And The 99's backstory takes place in 1258, and its history tells of the Mongols invading Baghdad and destroying it.

All the books in the Beit al-Hikma library, the most famous library at the time, were thrown into the Tigris river, which turned its color with ink.

It's a story passed down from generation to generation.

I rewrote the story. In my version the librarian knew this would happen. As an aside, if you want your comic book to succeed, make a librarian the main character. It always works.

(Laughter) (Applause) So the librarians found out and collected a special solution, a chemical solution called Kingswater. Mix this with the 99 stones and you can save all the cultures and histories in the book.

But the Mongols arrive there first.

Books and solutions are thrown into the Tigris River.

Some librarians go on the run and spend days or weeks soaking stones in the Tigris River, siphoning the collective wisdom everyone thinks is lost from civilization.

These stones were smuggled via Arabia into Andalusia, Spain, in three rosaries of 33 stones each, where they have been kept safe for 200 years.

But in 1492 two important things happened.

The first was the fall of Granada, Europe's last Muslim enclave.

The second is that Columbus finally gets the money to go to India, but gets lost.

(Laughter) So 33 of the stones were smuggled into the Nina, the Pinta, the Santa Maria and scattered across the New World.

The 33 will follow the Silk Road to China, South Asia and Southeast Asia.

And 33 are spread across Europe, the Middle East and Africa.

And now it's 2010 and we have 99 heroes from 99 countries.

Now, it is very easy to assume that those books are Islamic books, as they are from a library called Bait al-Hikma, but they are not, as the caliph who built that library, his name was al-Ma'amun and he was the son of Harun al-Rashid.

He told his advisers, "Call me all the scholars and let them translate every book they can get into Arabic, and I will pay them the weight in gold."

After a while his adviser complained.

They said, "Your Highness, the scholars are cheating.

They write big to get more money. ”

To which he said, "Leave them alone, because what they are giving us is worth far more than what we are paying them."

So the idea of ​​open architecture, open knowledge is not new to me in the desert.

The concept is centered around something called Nourstone.

Noor means light in Arabic.

These 99 stones are some rules in the game. First, you are not the one who chooses the stone. the stone chooses you

The storyline has elements of King Arthur.

Second, all 99 people abuse stones and powers when they first get them. They exploit it for their own personal gain.

There is a very strong message there that if you start abusing your stone, you will be taken advantage of by those who abuse your power.

Third, all 99 stones have built-in self-renewal mechanisms.

There are currently two groups in the Islamic world.

Everyone believes that the Qur'an is universally applicable.

Some believe this means that original interpretations from thousands of years ago are relevant today.

i don't belong there

And there are groups who believe that the Koran is a living, breathing document, and I captured that idea in a self-renewing stone.

Now the main villain, Rughal, doesn't want these stones to be updated and is trying to stop them.

He cannot use stones, but he can stop them.

And in stopping them, he has a more fascist plan, in which he makes some of the 99 work for him - they all wear the same stylized uniforms of the same color.

And he controls them from the top down. On the other hand, when they are working for the other side, and ultimately, when this person turns out to be wrong, they are being manipulated, they actually each wear a different colorful kind of dress.

And the final point about the 99 Nur stones is this.

In other words, The 99 operates in teams of three.

Why three? There are several reasons.

First of all, Islam has a rule that boys and girls should not be kept together. Because a third party is a temptation or a devil, right?

I think every culture has that, right?

But this is not about religion, nor is it about proselytizing.

There is a very powerful social message that needs to reach the deepest crevices of intolerance, and the only way to get there is to play some kind of game.

And here's how I dealt with it.

They work in teams of three. 2 boys and 1 girl, 2 girls and 1 boy, 3 boys, 3 girls, no problem.

Swiss psychoanalyst Carl Jung also spoke about the importance of the number 3 in all cultures, so I think it applies to me too.

good ...

I was accused on several blogs of being actually sent by the Pope to preach the Trinity and Catholicism in the Middle East. So you – (laughter) you believe who you want. I told you my version of the story.

So here are some of the characters we have.

Mujiba from Malaysia: Her greatest strength is her ability to answer any question.

She's the Queen of Trivial Pursuits if you want to, but when she first gets her powers, she starts making money by appearing on game shows.

There is Jabbar from Saudi Arabia. When he gets power he starts destroying things.

Well, naming Mumita was fun. Mumita is a Destroyer.

Therefore, the 99 attributes of Allah have yin and yang. Some are powerful, hegemonic, and strong, but others are kind and generous.

Are all the girls kind and compassionate and all the boys strong?

I've met several girls in my life who have been destroyers...

(laughter) Jami from Hungary is the first to start making weapons. He's a master of technology.

Musawira of Ghana, Hadiya of Pakistan, Jalil of Iran using fire.

And this is one of my favorites, Al-Batinah from Yemen.

Al-Batina is a hidden presence.

So Al-Batina is hiding, but she's a superhero.

I went home and said to my wife, "I made a character after you."

My wife is Saudi with Yemeni roots.

And she said, "Show me." So I showed this.

She said, "That's not me."

I said, "Look at your eyes. They are your eyes."

(Laughter) So I promised my investors that this wouldn't be another product made in a Fifth World country.

This would be Superman or otherwise not worth spending my time or their money.

So, people involved with the project from day one, X-Men and Power Rangers screenwriter Fabian Nicieza, bottom left.

Next to him is Dan Panosian, one of the modern X-Men character creators.

On the upper right is Stuart Moore, the writer of "Iron Man."

Next to him is Spider-Man inker John McCrea.

And we entered the Western consciousness in 2005 with the catchphrase "Next Ramadan, the world will have a new hero."

Well, I went to the Arab Thought Foundation conference in Dubai and was waiting for the right journalist over coffee.

There was no product, but there was energy.

And I found the New York Times man, so I cornered him and threw him.

And I think I scared him -- (laughter) because he basically promised me -- we don't have any product -- but he said, "If you walk away, I'll give the art section a break."

(Laughter) So I said, "Great." So I called him a few weeks later.

I said, "Hi, Hesa." and he said hello. I said, "Happy New Year."

He said, "Thank you. Baby is born." "Congratulations," I said.

You care about me too, right?

"So when will the article come out?"

He said, "Knives, Islam, and cartoons?

It's not timely.

Maybe next week, next month, next year, but it will definitely be published. ”

What happens a few days later?

What happens is the Danish cartoon controversy erupts in the world.

Timely.

(Laughter.) I was inundated with calls and emails from the New York Times.

The next thing I noticed was an article on January 22nd, 2006 that covered us all in a positive way. This day changed our lives forever. Because anyone who googles Islam and cartoons or Islam and cartoons can guess what they get. they caught me

And The 99 were like superheroes coming out of what was going on around the world.

That led to all sorts of things, from participating in college and school curricula, to one of my favorite photos I took in South Asia, consisting of a few men with long beards and a bunch of girls in hijabs. It was like school.

The good news is they were all smiling with copies of The 99 and found me signing pictures.

The bad news was that they were all copies, so they didn't make a penny.

(laughter) So far, we've managed to license 99 comics in eight languages: Chinese, Indonesian, Hindi, Urdu, and Turkish.

A year and a half ago it got its license in Kuwait and opened a theme park called The 99 Village Theme Park. 300,000 square feet and 20 vehicles, all featuring our characters. Got some back-to-school licenses in Spain and Turkey.

But the biggest thing we've done so far, which is absolutely amazing, is producing a 26-episode animated series for a global audience. In fact, we are already planning to go to the US and Turkey.

It's 3D CGI, will be very high quality, and was written in Hollywood by the writers of Ben 10, Spider-Man, and Star Wars: The Clone Wars.

This clip I'm about to show you has never been released to the public before, but there's a struggle there.

Two of the characters, the muscular jabber and the light-wielding Noora, are manipulated so they actually wear the stylized fascist gray uniform.

They don't know, OK, and they're about to add another member of The 99 to them.

There is conflict within the team.

So if I could get my hands on the light...

["The 99"] Jabbar: Dana, I don't know where to grab it.

I need more light.

what's happening?

Danna: Too much darkness.

Rugal: There must be something we can do.

Man: I'm not going to send any more special forces until I'm sure it's safe.

Dr. A.S. Razem: It's time to go, Miklos.

Miklos: I need to download the contents of the file.

I can't forget my aunt.

Jabbar: Dana, I can't do this without you.

Danna: But I can't help it.

Jabbar: Even if you don't believe in yourself right now, you can do it.

i believe in you.

You are the Nura of Light.

Danna: No.

I am not qualified for that. I am worth nothing.

Jabber: Then what about the rest of us?

Are we not qualified to be saved? Isn't that right?

Please tell me where to go.

Danna: That's right.

Alert: Imminent threat.

Jabber: Ahhh!

Miklos: Stay away from me.

Jabber: We are here to help you.

Dr. Razem: Don't listen to them.

Dana: Miklos, that man is not your friend.

Miklos: No, he gave me access, but he wants to reboot [unintelligible]. No more [unintelligible].

["The 99"] Thank you.

(Applause.) So, "The 99" is technology. It's entertainment. It's design.

But that's only half the story.

As a father of 5 sons, I worry about who they will use as role models.

I am concerned because I see religion being manipulated around me, even among my relatives.

As a psychologist, I worry about the world in general, but I also worry about how people see themselves in parts of my world.

Currently, I am a clinical psychologist. I am licensed in New York State.

I trained in Bellevue Hospital's Survivor of Political Torture Program, and I've heard too many stories of people who grew to worship their leadership and ended up being tortured by heroes.

Torture is terrifying enough on its own, but when it's done by a hero, it hurts you in many ways.

I left Bellevue, went to business school and started doing this.

Now, one of the things I mention about the importance of this message is when I gave a lecture at the Medical School of Kuwait University. So I gave a lecture on the biological basis of behavior and gave the students two articles (one from the New York Times and one from the New York Magazine).

And I removed the writer's name, the [unintelligible] person's name - all but the fact disappeared.

And the first was about a group called "God's Party" who wanted to ban Valentine's Day. Red is now illegal.

If you find a boy and a girl to flirt with, they will get married in no time.

In the second, a woman complained after three minivans with six bearded men stopped and were questioned on the spot for talking to an unrelated man.

And I asked the Kuwaiti students where they thought these incidents happened.

The first one said Saudi Arabia. There was no discussion.

The second was actually split between Saudi Arabia and Afghanistan.

What struck their minds was that the first event took place in India and it was a Hindu God party.

The second occurred in upstate New York.

It was an Orthodox Jewish community.

But what is heartbreaking and disturbing to me is that in these two interviews, people around me who were also interviewed called the act Talibanization.

In other words, no good Hindu or good Jew behaves like this.

This is the influence of Islam on Hinduism and Judaism.

But what do Kuwaiti students say? They said it was us and this is dangerous.

It is dangerous for groups to identify themselves as extremes.

This is one of my sons, Rayanne. He's a Scooby-Doo addict.

You can tell by looking at those glasses.

Actually, the other day he called me a "meddlesome boy".

(Laughter) But I borrow the lessons I learned from him.

Last summer when we were at our house in New York, he was out in the yard playing in the playhouse. And when I was working in my office, he came in and said, "Baba, I want you to come with me. I want my toys."

"Yes, Ryan, go ahead." He left Scooby-Doo at home.

I said, "Go. I'm at work. I'm busy."

What Ryan did then was sit there and tap his feet on the floor at 3 1/2 and he looked at me and said, 'Bubba, I want you to come with me to my office.

I have work to do. ”

(Laughter) (Applause) Rayanne reframed the situation and lowered her level to mine.

(Laughter) And with The 99, that's what we're trying to do.

You know, I think there's a great parallel between breaking the shape of a cross and making a swastika.

And when I see pictures like this of a parent or uncle who finds it cute that a small child is holding a Quran and wearing a self-belt to protest against something, there is hope that one day, by associating enough positive things with the Quran, we can transform this kid from the way we are proud of it.

And I think - I think The 99 can and will accomplish that mission.

As undergraduates at Tufts, we were handing out free falafel one day. It was, you know, Middle East day or something.

And people picked up the culturally resonant image of falafel, ate it, and, you know, talked about it and left.

And not everyone could agree on what the word free is and what the word falafel is. Behind us it was 'free falafel'. Look.

(Laughter) Or so I thought, but a woman rushed across campus, dropped her bag on the floor, pointed to a sign and said, "Who's the falafel?"

(laughs) True story.

(laughter) She had actually just come out of an Amnesty International meeting.

(Laughter) Just today, D.C. Comics announced the covers for their upcoming crossovers.

Its cover features Batman, Superman, and Wonder Woman in clothes, along with Saudi, United Arab Emirates, and Libyan members of The 99.

On April 26, 2010, President Barack Obama said that of all efforts since his now-famous Cairo speech to reach out to the Muslim world, The 99's reaching out to America's Justice League was the most innovative.

We live in a world where the most culturally innocuous symbols like falafel can be misunderstood for baggage, where religion can be twisted and deliberately made where others don't envision it.

In such a world, they would always be Superman and The 99's job.

thank you very much.

(applause)

About ten years ago, I took on the task of teaching global development to undergraduate students in Sweden.

That was after working with African institutions to study hunger in Africa for almost 20 years.

So I was expected to know a little bit about the world.

And I started an undergraduate course at the Karolinska Institutet Medical University called Global Health.

But when the opportunity comes, I get a little nervous.

The students who come to us actually have the best grades they can get in the Swedish university system, so I thought maybe they knew everything I was going to teach them.

So I did a pre-test when they came.

And one of the questions I learned a lot from was, "Which country has the highest child mortality rate among these five sets?"

And then we combined them so that in each country, one country had twice the child mortality rate of the other.

This means that the difference is much larger than the uncertainty in the data.

I'm not going to test it here, but the highest is Turkey, followed by Poland, Russia, Pakistan and South Africa.

And these were the results of Swedish students.

I did this and got a confidence interval, which was fairly narrow.

And of course I was happy - 1.8 out of 5 correct.

So there was a place for a professor of global health and my course.

(Laughter.) But late one night, while I was compiling my report, I really realized my discovery.

I have shown that, statistically, high performing Swedish students know significantly less about the world than chimpanzees.

(Laughter) Because if you give Sri Lanka and Turkey two bananas, the chimpanzee will get half right.

They are true in half the cases. But there are no students there.

The problem for me was not ignorance. It was a preconceived notion.

There was also an unethical study of professors at the Karolinska Institutet, which awards the Nobel Prize in Medicine, and they were on a par with chimpanzees there.

(Laughter) This is where I realized that communication is really necessary. Because we know what is happening in the world and the data on child health in each country.

So I developed software to display it like this.

Every bubble here is country.

The country here is China.

The size of the bubble is the population, and here we put the fertility rate on that axis.

Because what did my students say when they saw the world, and I asked them, "What do you really think about the world?"

Well, this is the first time I learned that the main textbook is Tintin.

(Laughter.) And they said, 'The world is still 'us' and 'them'. And "we" is the Western world, and "they" are the Third World. ”

"So what do you mean by 'Western world'?" I said.

"Well, it's a long life and a small family.

So this is what we can display here.

Let's put the birth rate here. The number of children per woman is 1, 2, 3, 4, up to about 8 per woman.

We have very good data on family size for all countries since 1962-1960.

The margin of error is narrow.

Here, life expectancy at birth ranges from 30 years in some countries up to about 70 years.

And in 1962, the developed countries were gathered here, with few families and longevity.

And these were developing countries.

They had large families and relatively short lives.

So what happened after 1962? We want to see the changes.

Are the students correct? Are there two types of countries?

Or do these developing countries have small families living here?

Or do they live long and live there?

let's see. We stopped the world then.

This is all UN statistics available.

please. can you see that?

All green countries in Latin America are aiming for smaller families.

The yellow countries here are the Arabian countries, which have longer life spans but do not have large families.

Africans are green here. they are still here.

This is India. Indonesia is progressing pretty fast.

In the 80's Bangladesh was still among the African countries.

But now in Bangladesh this is a miracle that happened in the 80's. Imams have started promoting family planning and are making inroads into it.

Then in the 90s came the dreaded HIV epidemic that reduced life expectancy in African countries.

And the rest all move to the corner, where we can live longer, have smaller families, and have a whole new world.

(Applause) (End of applause) Let's make a direct comparison between the United States and Vietnam.

1964: America had fewer families and longer life spans. Vietnam was short-lived with a large family.

And this happens.

Wartime data show that life expectancy improved despite all deaths.

By the end of the year, family planning began in Vietnam, targeting small families.

And there in the United States family numbers are maintained and lifespans are extended.

And now in the 80s they have abandoned their communist plans and are aiming for a market economy, which is moving faster than social life.

And today Vietnam has the same life expectancy and the same family size as here in 2003 and in the United States until the end of the war in 1974.

Without looking at the data, I think we are all underestimating the great change in Asia, where social change preceded economic change.

Now let's move on to another way in which we can view the global distribution of income.

This is the income distribution of people in the world.

$1, $10, or $100 per day.

There is no longer a gap between rich and poor. This is a myth.

There is a small hump here.

And if you look at where that income is going, this is 100% of the world's annual income.

And the richest 20 percent take about 74 percent of that.

And the poorest 20 percent rob about 2 percent.

And this makes the concept of a developing country extremely dubious.

We think of helping like the people here helping the people here.

But in between lies the bulk of the world's population, who now have 24 percent of the income.

We heard it differently.

Where are the different countries?

I can show you Africa.

This is Africa.

This is the OECD, that is, the rich countries, the country club of the United Nations.

And they are on this side. Africa and the OECD overlap considerably.

And here in Latin America.

From the poorest to the richest people in Latin America, everything on this planet is here.

On top of that you can put Eastern Europe, Eastern Asia and Southern Asia.

So how did things go back to the 1970s?

Then there was an even bigger hump.

And most of those who lived in absolute poverty were Asian.

The world problem was poverty in Asia.

And if I move the world forward now, we will see that while the population grows, hundreds of millions of people in Asia will be lifted out of poverty and some others will fall into poverty. This is our pattern today.

And the World Bank's best prediction is that this will happen and the world will not be divided.

Of course, we have a logarithmic scale here, but our concept of the economy is growth by percentage.

We believe that the percentile may increase.

If we change this to get GDP per capita instead of household income, transform these personal data into Gross Domestic Product regional data, and remove region here, the size of the bubble is still population.

You have the OECD there, you have Sub-Saharan Africa, you can take out the Arab countries there that come from both Africa and Asia and put them separately, you can extend this axis and add social values ​​to it, child survival, and give it a new dimension here.

Now I have money on that axis and the possibility of my children living there.

In some countries, 99.7% of children survive to age 5. Only 70 others.

And here there seems to be a chasm between the OECD, Latin America, Eastern Europe, East Asia, the Arab States, South Asia and Sub-Saharan Africa.

There is a very strong linearity between child survival and money.

But let's divide sub-Saharan Africa.

Health is out there, better health is out there.

You can go here, or you can divide Sub-Saharan Africa into countries.

And when it bursts, the size of the bubble in each country will be the size of the population.

Below is Sierra Leone and above is Mauritius.

Mauritius was the first country to bypass trade barriers, allowing it to sell sugar and textiles on par with those in Europe and North America.

There is a big difference in Africa.

And Ghana is right here in the middle.

Humanitarian assistance in Sierra Leone.

Here in Uganda, development assistance is taking place.

Start investing now. You can spend your vacation there.

Africa has tremendous diversity, but we often think that all Africa is the same.

You can divide South Asia here. India is a big bubble in the middle.

However, there are significant differences between Afghanistan and Sri Lanka.

Arab countries can be divided. how are they?

Same climate, same culture, same religion - big difference.

Even between neighboring countries - Yemen, civil war. United Arab Emirates, money was spent quite evenly and well.

That includes all the children of foreign workers in the country.

Data is often better than you think. A lot of people say the data is bad.

There is a margin of uncertainty, but you can see the difference between Cambodia and Singapore.

The difference is much bigger than the weakness of the data.

Eastern Europe: The Soviet economy lasted a long time, but 10 years later we are in a very different economic situation.

And then there is Latin America.

Chile will have a lower child mortality rate than Cuba in the next few years.

Here are the OECD high-income countries.

And we see here a general pattern of the world more or less like this.

And when you see what the world looks like in 1960, it starts to move.

Mao Zedong. He brought health to China.

and he died.

And we've seen how countries are moving in different directions like this. That's why it's a bit difficult to cite examples of countries that show patterns in the world.

But I want you to remember here in 1960.

I would like to compare Korea with this and Brazil with this.

And I would like to compare it with Uganda there.

You can run it before like this.

We can see that South Korea is progressing very quickly whereas Brazil is much slower.

And here we go back again, and when we lay the trail like this, we again see that the speed of development is very different. Countries are moving more or less at the speed of money and health, but it seems that health first can go much faster than wealth first.

And to show it, you can make your way to the United Arab Emirates.

They came here from the land of minerals.

They hid all their oil. they got all the money. But you can't buy health at the supermarket.

You have to invest in your health. I have to send my children to school.

Medical staff must be trained. We have to educate the people.

And Sheikh Zayed has done it in a pretty good way.

He brought this country up here despite falling oil prices.

In short, we are seeing a more mainstream picture of the world, where every country tends to spend money better than before.

Well, this is more or less like this when looking at the average data for each country.

It is dangerous to use average data because there are large differences between countries.

So, when you go to see this place, you can see that present-day Uganda is where Korea was in 1960.

Splitting Uganda creates considerable differences even within Uganda.

These are the quintiles of Uganda.

This is what happens when you divide South Africa.

And if you look at Niger, which has (recently) suffered from severe hunger, it looks like this.

Even though Niger's poorest 20 percent are here and South Africa's richest 20 percent are there, we tend to debate what solutions should be in Africa.

Everything in this world exists in Africa.

And we cannot argue for universal access to HIV [treatment] for that quintile with the same strategy that we have here.

Global improvement has to be highly contextualized, it doesn't matter if it's done at the local level.

I have found that my students are very excited to be able to use this.

And furthermore, policymakers and the corporate sector want to know how the world is changing.

Now, why is this not happening?

Why not leverage the data we have?

We have data from the United Nations, national statistical agencies, universities and other non-governmental organizations.

Because the data is hidden in the database.

We have the public and the Internet, but we are not yet using it effectively.

All the information we see changing in the world does not include publicly funded statistics.

There are some webpages like this, but they take the nutrients out of the database, but people put prices on them, stupid passwords and boring stats.

(Laughter) And this doesn't work.

(Applause.) So what do we need? we have a database

You don't need a new database.

We have great design tools, and we're adding more here.

So we launched a not-for-profit venture that brings data to design called 'Gapminder', which is warned by the London Underground to 'beware of gaps'.

And I started writing software that could link data in this way.

And it wasn't that hard.

I've been making animations for years.

We are releasing UN data, some UN bodies.

Some countries allow their databases to be made available to the world.

But what we really need, of course, is search functionality, where we can copy the data into a searchable format and publish it to the world.

And what do we hear when we walk around?

I have done anthropology on major statistical units.

Everyone says, "I can't, I can't."

Our information is so specific in detail that it is not possible to search it for others to search.

Data cannot be given free to students or free to entrepreneurs around the world. ”

But this is what we want to see, isn't it?

Publicly funded data can be found here.

And I want to make flowers bloom on the internet.

One of the key points is to make them searchable. Then you can create animations there using a variety of design tools.

And I have very good news.

The good news is that the [current] new UN Statistics Director is not saying it is impossible.

He just says "I can't do that".

(Laughter) And he's very smart, isn't he?

(Laughter) So you can see a lot going on with the data in the next few years.

We will be able to look at income distribution in a whole new way.

This is China's income distribution in 1970.

This is the US income distribution in 1970.

Very little duplication.

And what happened?

What happened is that China is growing up, it's not so equal anymore, and it's appearing here like a ghost, overlooking the United States.

(Laughs) It's pretty scary.

(Laughter) But I think it's very important to have all this information.

really need to see it.

And instead of looking at this, I'd like to end by showing Internet users per 1,000 people.

The software gives you very easy access to about 500 variables from all countries.

It takes a little while to change this, but on the axis it's very easy to get the variables you want.

And most importantly, get your databases for free, make them searchable, and in a second click convert them into a graphical format so you can understand them instantly.

Well, statisticians don't like this. Because it doesn't show reality. Statistical and analytical methods are required.

But this is hypothesis generation.

I'm done with the world now.

That's where the internet comes in.

This is GDP per capita.

And it's the emergence of new technology that, surprisingly, fits well into each country's economy.

That's why a $100 computer is so important.

But it's a good trend.

It feels like the world is flattening out.

These countries are doing more than the economy, and it will be very interesting to track this year-on-year. I would like to ask you to use all publicly funded data to investigate.

(applause)

Well, indeed I am very, very lucky.

My talk is basically written by three historical events that happened within a few days during the last two months. Seemingly irrelevant, as you can see, it's actually all related to what I want to talk about today.

The first was actually a funeral, or more precisely, a reburial.

On May 22nd, in Frombork, Poland, the reburial of the hero of the 16th-century astronomer who really changed the world took place.

He did so literally by replacing the Earth with the Sun at the center of the solar system, and by this seemingly simple act he actually set off what many call the scientific and technological revolution, the Copernican Revolution.

Now, ironically, and very fittingly, that was how we found his grave.

As was customary at the time, Copernicus was actually simply buried in an unmarked tomb along with 14 others in the cathedral.

DNA analysis was one of the hallmarks of the last 400 years of the scientific revolution he started, a way to discover which set of bones actually belonged to someone who read every astronomy book filled with stubble, the hair of Copernicus.

The match was clear.

The DNA matched, confirming that this was indeed Nicolaus Copernicus.

Now, when we talk about Copernicus, the relationship between biology and DNA and life is very intriguing. Because even then, his followers quickly took a logical step and asked, "If the Earth is just a planet, what about the planets around other stars?"

What are your thoughts on the plurality of worlds, life on other planets?

In fact, I am borrowing here from one of the books that was very popular at the time.

And at the time, people actually positively answered yes to that question.

However, there was no evidence.

And here begins the 400-year-long frustration of the unfulfilled dreams of Galileo, Giordano Bruno, and many others who never came to an answer to the very basic question that humanity has always asked.

"What is life? What is the origin of life?"

are we alone? ”

And that has happened especially in the last decade, that is, at the end of the 20th century. At the time, the beautiful developments of molecular biology, the code of life, and our understanding of DNA all seemed to actually move us farther from answering these fundamental questions than closer to them.

Well, good news.

A lot has happened in the last few years. Let's start with the planets.

Let's start with the old Copernican question: Is there an Earth around other stars?

And, as you've heard, we're trying to answer that question, and now there's a way to do it.

A new telescope.

I think our team named it after one of the Copernican dreamers, Johannes Kepler, whose sole purpose is to go out and find planets orbiting other stars in our galaxy and tell us how often there are planets like Earth.

The telescope is actually built like the well-known Hubble Space Telescope, except that it has an extra lens — what photographers call a wide-field lens.

And in the next few months, if you go out early in the evening, look straight up and put your palms like this, you'll actually see, for the next four years, uninterrupted fields where this telescope is looking for planets day and night.

In fact, the way to do this is through a method called the transit method.

This is actually a mini eclipse that occurs when a planet passes in front of its star.

Not all planets are oriented that way by chance, but one million stars is enough to find them.

And as you can see in this animation, all Kepler is trying to detect is the dimness of light from the star.

We do not intend to see the images of stars and planets in this way.

All Kepler stars are just points of light.

But we learn a lot from it. You learn not only that there are planets out there, but also their size.

How much light is dimmed depends on the size of the planet.

Learn about its orbit and revolution period.

So what have we learned?

Now, let me walk you through what we're actually seeing so you can understand the news I'm here to share with you today.

What Kepler will do is discover a number of candidates, track them down, discover them as planets, and confirm them as planets.

This basically says that this is the size distribution of the planets.

There are small planets, there are bigger planets, and there are big planets.

Therefore, there are countless such planets, but they have different sizes.

Our solar system does that.

In fact, even in ancient times, the solar system in that sense was depicted in diagrams like this:

There will be smaller planets and larger planets going back to Epicurus, and of course Copernicus and his followers.

Until recently, it was the solar system, four Earth-like planets with small radii and about twice the size of Earth. And it was of course Mercury, Venus, Mars, and of course Earth, and two big giant planets.

Then the Copernican Revolution introduced the telescope and of course three more planets were discovered.

Now, the total number of planets in our solar system is nine.

Small planets prevailed, and there was a certain harmony in them. In fact, Copernicus took note of it with great pleasure, and Kepler was one of its great supporters.

So Pluto joins the number of small planets.

But literally, until 15 years ago, that was all we knew about the planet.

And that was the source of his frustration.

The Copernican dream was not fulfilled.

Finally, 15 years ago, the technology got to the point where it could detect planets around another star, and it actually worked pretty well.

Over the next 15 years, nearly 500 planets orbiting other stars were discovered in various ways.

Unfortunately, as you can see, I had a completely different image.

Of course there was an explanation for this. Since we can only see large planets, most of them actually fall into the "Jupiter-like" category.

But you know, we haven't gone very far.

We were still back where Copernicus was.

There was no evidence that planets like Earth exist.

And we are interested in planets like Earth because we understand that small planets with water and rocks and a lot of complex chemistry are really needed for life as a chemical system to actually begin, emerge and survive.

And there was no evidence of that.

So today I'm here for the first real glimpse of what the new Kepler telescope has been able to tell us in the last few weeks. And, oh my god, we are back in harmony and are living out Copernican's dream.

As you can see here, small planets dominate the picture.

Planets marked as "Earth-like" are arguably more Earth-like than any other planet we see.

And now, for the first time, I can say that.

There is still a lot to be done in this regard.

Most of these are candidates.

We will be looking at them in the next few years.

But the stats are clear.

And the statistical result is that there are planets like our Earth out there.

Our Milky Way galaxy is rich in such planets.

So the question is what to do next.

First of all, now that we know where they are, we can study them.

And we can find a place that we should call habitable. This means they have conditions similar to those we experience on Earth, and many complex chemistries can occur.

Therefore, we can also quantify how many of these planets are expected to serve as ports for our Milky Way galaxy.

And, as you can imagine, the numbers are pretty staggering.

There are about 100 million such planets.

That's great news. why?

Because within the next two years we will be able to identify at least 60 of them with our own small telescopes.

This is great. That way, of course, I can do my research remotely, using all the techniques I've already tested over the last five years.

We can tell what they are made of and whether their atmosphere contains water, carbon dioxide, or methane.

We know it and we expect it to happen.

That's great, but it's not the only news.

That's not why I'm here.

The reason I'm here is to tell you that the next step is the really exciting part.

This step enables the following steps:

And here biology comes into play. There are fundamental questions in biology that are still unanswered. It essentially says, "If there is life on other planets, do we expect it to be similar to life on Earth?"

And let me just say right here, when I say life, I don't mean the "sweet life," the good life, the human life.

What I really mean is that, past and present, from microbes to us humans, in its rich molecular diversity, the way we now understand life on Earth as a collection of molecules and chemical reactions, which we collectively call life as biochemistry, chemical processes and chemical phenomena.

The question, then, is whether the chemistry is universal or earth-dependent.

Is it like the same gravity everywhere in the universe, or is there all sorts of different biochemistry everywhere we find it?

When trying to do that, we need to know what we are looking for.

This is a very basic question and I don't know the answer, but I can and am trying to answer it in my lab.

You don't have to go to space to answer that question.

That's what we're trying to do.

And that's what a lot of people are trying to do now.

And a lot of the good news comes from that part of the bridge that we're going to build.

Therefore, I would like to introduce an example here.

When we think about what it takes for the phenomenon we call life, we think about compartmentalization, keeping the molecules important for life in membranes, isolated from the rest of the environment, but in environments where they can actually occur together.

And in one of our labs, Jack Shostak's lab, a series of experiments carried out over the past four years have shown that, in an environment very common on certain types of planets like Earth, where liquid water and clay are present, there are naturally occurring molecules that eventually spontaneously form gas bubbles.

But those bubbles have membranes that are very similar to those of all cells of all living things on Earth.

And they really help nucleic acid-like molecules like RNA and DNA stay inside and develop, change, divide and do some of the processes we call life.

This is just one example to illustrate the avenues in trying to answer the larger question of the universality of phenomena.

And in a way, you can think of the work that people around the world are starting right now as building bridges across rivers from both sides.

On the one hand, on the left bank of the river are people like me who are studying those planets and trying to define their environment.

We don't want to go blind because there are too many possibilities, not too many labs, and not enough human time to actually do all the experiments.

That's what we're building from the left side of the river.

From the right bank of the river is the lab experiment I showed you earlier, where we actually tried it. I hope it feeds back and forth and we meet in the middle someday.

So why should you care?

Why am I selling you a bridge under construction?

am i that attractive?

Well, there are many reasons, and you've heard some of them in today's short talk.

This understanding of chemistry actually helps us in our daily lives.

But there is something deeper, deeper here.

And the deeper underlying point is that science is in the process of redefining life as we know it.

And it will fundamentally change our worldview. Not by what Copernicus did 400 years ago, but by changing the way we look at space and time.

Now we're talking about something else, but it's just as profound.

And half of what's happening is that this kind of worthlessness has to do with humanity and the larger universe of Earth.

And the more I learned, the more reinforced that thought was.

I'm sure you all learned in school how small the Earth is compared to the vastness of the universe.

And the bigger the telescope, the bigger the universe.

Look at this little blue dot image.

This pixel is the Earth.

It's the Earth as we know it.

In this case, it is seen from outside the orbit of Saturn.

But it's really small.

we know that

Think of life as the planet as a whole. In a way it is.

The biosphere is about the size of the Earth.

Life on Earth is about the same size as Earth.

And let's compare it spatially with the rest of the world.

What if all the Copernican trivialities were actually wrong?

Can we then take more responsibility for what is happening today?

Let's try it in action.

In other words, the Earth is very small in space.

Can you imagine how small it is?

i will try.

Now let's say this is the size of the observable universe, including all galaxies and all stars. From here to here.

Do you know how big this necktie is?

It can be as big as a single tiny atom.

It's unimaginably small.

We can't even imagine.

I mean, I can see a tie, but I can't even imagine seeing the size of a tiny tiny atom.

But that's not all.

Universe and life exist in both space and time.

If that was the age of the universe, now is the age of life on earth.

Consider the oldest organisms on earth. However, it is a cosmological proportion.

This is not important.

This is very important.

So while the size of life may be insignificant, it is not insignificant in terms of time.

Life and the universe are compared to each other like child to parent, parent to child.

So what does this tell us?

This shows that all that trivial paradigm that we somehow learned from the Copernican principle is wrong.

In this universe, life has immeasurable and powerful potential. Especially now that we know that places like Earth are commonplace.

And that potential, that powerful potential, is also your potential and mine.

And if we are to be custodians of the Earth and its biosphere, we better understand the importance of the universe and do something about it.

And the good news is that it can actually be done.

And let's do it.

Let this new revolution begin at the end of the old one, using synthetic biology as a way to transform both our environment and our future.

And I hope we can build this bridge together and meet in the middle.

thank you very much.

(applause)

Until now, our communication with machines has always been limited to conscious and direct forms.

Whether it was something as simple as turning on a light with a switch or something as complex as programming robotics, to get the machine to do something, we always had to give it a command, or even a series of commands.

Communication between people, on the other hand, is much more complex and much more interesting because it considers more than is explicitly expressed.

We observe facial expressions and body language and can intuit feelings and emotions from interactions with each other.

This is actually a big part of our decision making process.

Our vision is to introduce this entirely new realm of human interaction to human-computer interaction, enabling computers not only to understand what the user says, but also to respond to the user's facial expressions and emotional experiences.

And there is no better way to do this than by interpreting the signals naturally produced by the brain, the center of control and experience.

Well, it sounds like a great idea, but as Bruno said, the task is not trivial for two main reasons. One is the detection algorithm.

Our brain consists of billions of active neurons with axonal lengths of about 170,000 km.

When these neurons interact, a chemical reaction releases an electrical impulse that can be measured.

Most of our functional brain is distributed in the outer surface of the brain, and the surface of the brain is highly folded to increase the area available for mental performance.

Now, this cortical folding presents a major challenge in interpreting surface electrical impulses.

Each individual's cortex is folded in a manner very similar to a fingerprint.

Thus, even if the signal is coming from the same functional part of the brain, by the time the structure folds, its physical location varies greatly between individuals and even between identical twins.

The surface signal is no longer consistent.

Our breakthrough was to create cortical unfolding algorithms that allowed us to map signals closer to their source, thus enabling them to function across large populations.

The second issue is a device for actually observing brain waves.

EEG measurements typically use a hairnet with a series of sensors, like the one in the picture.

The technician uses a conductive gel or paste to affix the electrodes to the scalp, usually after a procedure that prepares the scalp by light scraping.

This is a very time consuming and not very pleasant process.

Moreover, these systems actually cost tens of thousands of dollars.

So I'd like to invite one of last year's speakers, Evan Grant, on stage. He kindly agreed to help demonstrate what we were able to develop.

(Applause) Now, the device you're looking at is a 14-channel high-fidelity EEG acquisition system.

No scalp preparation or conductive gels or pastes required.

It only takes a few minutes to put it on and get a stable signal.

It's wireless, so you can move freely.

The headset costs only a few hundred dollars, compared to tens of thousands of dollars for traditional EEG systems.

Now let's move on to the detection algorithm.

So, as mentioned earlier in the emotional experience, facial expressions are really designed to work out of the box with some sensitivity adjustments available for personalization.

However, due to time constraints, I would like to show you the Cognitive Suite, which is basically the ability to move virtual objects in your head.

Evan is new to the system, so the first thing we need to do is create a new profile for him.

He's clearly not Joanne, so 'Add User'.

Evan. have understood.

So the first thing we need to do in the cognitive suite is start by training the neutral signal.

For neutral, Evan does not need to do anything.

he's just hanging out. he is relaxed

And since every brain is different, the goal is to establish a baseline or normal state for his brain.

This takes 8 seconds. Once that's done, you'll be able to select movement-based actions.

So, Evan, pick something that you can visualize clearly in your mind.

Evan Grant: Let's "pull."

Tan Le: So let's select "Pull".

The idea here is that Evan has to imagine the object coming forward in the screen, and while he's doing it, there's a progress bar that scrolls across the screen.

At first, the system doesn't know what to think about "pulling", so nothing happens.

But keep that thought in mind for the entire eight seconds.

So 1, 2, 3, go.

have understood.

So if you accept this, the cube will be valid.

So let's see if Evan can actually imagine pulling and try it.

Oh good job!

(Applause.) That's really cool.

(Applause.) So, in the meantime, I'd like to ask Evan to do a really difficult task.

And this is hard because it's all about being able to visualize things that don't exist in our physical world.

This is "annihilation".

So what you want to do, at least with movement-based actions, we're doing it all the time, so you can visualize it.

But in "Annihilation" there really are no parallels. So, Evan, what you want to do here is imagine the cube slowly disappearing, okay.

A similar drill. So 1, 2, 3, go.

have understood. Let's try it.

fault. He's just too good.

Let's try again.

EG: Lost focus.

(Laughter) TL: But even if you can only hold it for a short amount of time, you'll find that it actually works.

As I said earlier, this is a very difficult process to imagine.

And the nice thing about this is that it only gives the software one example of how he thinks about "disappearing".

This includes machine learning algorithms -- (applause) Thank you.

well done. well done.

(Applause.) Thank you, Evan, you are a great example of this technology.

As you can see, the software has a built-in leveling system, so as Evan and the users become more familiar with the system, they add more and more detections, allowing the system to distinguish between different thoughts.

And once you've trained your detection, you can assign or map those thoughts to any computing platform, application, or device.

There are many applications for this new interface, so I'd like to share some examples.

For example, in games and virtual worlds, facial expressions can be used naturally and intuitively to control avatars and virtual characters.

Of course, you can also experience magical fantasies and control the world with your own mind.

Colors, lighting, sounds and effects can also dynamically respond to emotional states to enhance the experience in real time.

We then move on to some applications developed using robots and simple machines by developers and researchers around the world. In this case, you can fly a toy helicopter just by thinking "lift it up" in your mind.

This technology can also be applied to real-world applications, in this example smart homes.

You know, from the user interface of the control system to opening and closing the curtains.

And of course, turn the lights on or off as well.

And finally, we reach real life-changing applications, such as controlling a power wheelchair.

In this example, facial expressions are mapped to movement commands.

Man: Now blink right and go right.

Flash left and back left.

Come on, smile and go straight.

TL: Really -- thank you.

(Applause.) We've only scratched the surface of what is currently possible. With the input of the community and the participation of developers and researchers from around the world, we hope that you will help shape the direction that technology will take in the future. Thank you very much.

Kick the bucket, nibble on the dust, cash your chips, check out, leave, cut the expiration date, pop out forever...

These are all euphemisms we use with humor to describe the only event in life we ​​all experience: death.

But most of us don't want to acknowledge death, make plans about it, or talk about it with the most important people in our lives.

In the Australian community where I grew up, people died of old age and illness, and funerals were attended only by adults.

My parents came home sad and exhausted, but we never talked about it.

So I was clueless to death and the grieving process.

I received an invitation when I was 15.

When my dear neighbor, who was like an aunt to me, died suddenly of a heart attack, I attended my first funeral and gave my first reading.

I didn't know chest tightness and dry mouth were normal.

The priest got some facts wrong and it really pissed me off.

He talked about how she loved knitting.

knitting.

(Laughter.) He didn't mention that at 75, she still mows her own lawn, has a nice fish pond in her front yard, and makes her own ginger beer.

I'm sure she didn't choose the words "avid knitter" in her tribute.

(Laughter) I believe that discussing death as part of our daily lives gives us the opportunity to reflect on our core values ​​and share them with those we love, so that survivors can make informed decisions without fear or regret for failing to honor their legacy.

I am fortunate to lead an amazing and culturally diverse team, but in the last 12 months I have lost five parents, including my own father, and most recently a former colleague who died of colon cancer at the age of 41.

We started having open and candid conversations about what we were going through.

We talked about real things, things no one prepared for. Government agencies, hospitals, nursing homes, advanced care orders, interactions with funeral homes and relatives, (laughter) decisions about coffins, tombstones, tombstone wording, tombstone font sizes, all in the midst of sleep deprivation.

We also discussed the issues posed by our different cultural backgrounds, and realized that there can be huge differences in how we mourn the death of a loved one.

A good example of this is the 'sorry business' practiced by Aboriginal and Torres Strait Islander peoples.

During sorry business, families assume specific roles and responsibilities, and protocols such as limiting the use of photographs, saying the names of the deceased, and conducting smoking ceremonies are all expressions of respect and allow for a peaceful transition of spirit.

These customs are in stark contrast to Western culture, which honors the memories of loved ones by talking about them and sharing photos.

The lesson I learned from this lesson last year is that life will be much easier if we talk about death now that we are healthy.

Most of us wait until we get too emotional, sick, or physically exhausted, but then it's too late.

Isn't it time we started making our finale on this planet our own?

So let's get started.

Do you know what you want when you die?

Do you know how you want to be remembered?

Does location matter?

Do you want to be near the sea or in the sea?

(Laughter.) Do you want a religious service, an informal party, or a party with literally fireworks?

(Laughter) There's a lot to discuss about death, but I'd like to focus on two aspects. One is why talking about and planning your own death can help you experience a good death and reduce stress for your loved ones. And how talking about death can help support those who are grieving.

So let's make a plan.

How many people have wills?

Please raise your hand.

Oh this is great.

In Australia, 45 percent of adults over the age of 18 do not have a legal will.

you are a little above average.

This is an amazing statistic considering that making a will is actually very easy and inexpensive.

So I asked my friends and neighbors, and I was really surprised to learn that many people don't have a will, and some couples don't realize the need for a personal will.

The usual explanation was, well, it would all go to my partner anyway.

So while laws vary from state to state and country to country, keep in mind that this is what happens in New South Wales if you die without leaving a legal will.

First, a suitable administrator must be appointed by the Supreme Court of New South Wales.

Perhaps this person never met the deceased.

That person will be responsible for arranging your funeral, collecting property, and distributing debts and taxes after payment.

And one of those debts will be your service bill.

This person is no stranger to knowing that you want to give the four-foot-tall wooden giraffe in your living room to the person who helped you carry it to the other side of the world. Yes, it's in my will.

(Laughter) If you leave a spouse or spouse behind and die, they may receive your estate, but if you are single, things are much more complicated as your parents, siblings, half-brothers, and dependents are all involved.

And did you know that if you donate regularly to a charity, that charity may have grounds for making claims against your property?

The most important thing to know is that the bigger the property, the more complicated the process and the higher the bill.

So, I would like to ask those who do not have a will...

When in your life have you willingly donated money to the government without needing it?

(Laughter) I lost my father in February to progressive lung disease.

When my father learned that his death was imminent, he had three distinct wishes.

He wanted to die at home. He wanted to die surrounded by his family. And he wanted to die in peace, without suffocating or gasping.

And I am happy that my family was able to support my father's wishes, and that he was able to achieve his goals and die a good death in that sense.

He died deliberately.

My father wanted to die at home, so we had some pretty tough discussions and a lot of paperwork.

Questions on the form cover everything from resuscitation to organ donation.

My father said, "Please take whatever organs you can use."

This upset my mother because my father's health was deteriorating rapidly and it was no longer the right time to talk about organ donation.

I believe we need to discuss these issues when we are healthy and fit. That way, you can get rid of your emotions, and then you'll learn not only what's important, but why it's important.

So, as part of my journey, I started engaging with family and friends to hear their thoughts on death and how they would like to be remembered.

I discovered that I could host a "Death Over Dinner" or a "Death Cafe". This is a nice casual way to introduce this topic...

(Laughter) And you get great insight.

(laughter) Did you know that your body has to be disposed of legally and can't just be pushed off a cliff or set on fire in your backyard?

(Laughter) In Australia, you have three options.

Burial and cremation are the most common, but bodies can also be donated to science.

And we are happy to report that the innovation has also made an impact in the world of carcass disposal.

(Laughing) Now you can also choose an eco-funeral.

You can also bury it at the base of a tree in a recycled cardboard or wicker basket. For those who love the sea, there are also eco-friendly urns that melt in the sea.

Personally, I plan to cremate them, but when it comes to getting seasick, I can't think of anything worse than having my remains thrown into a big ocean swell.

Actually, I bought land in the rose garden next to my father.

I call it an investment property.

(Laughter) But unfortunately, there are no tax credits.

(Laughter.) So if you plan your own death, survivors will know how to experience a healthy bereavement without feeling fear or guilt for failing to honor your legacy.

As part of my research, I have attended seminars, read books, and spoken to palliative care nurses.

And as a result of not talking about death, we've come to understand that we don't know how to deal with grief.

And conversely, the more we talk about death, the more comfortable we become with the emotions we experience around grief.

I realized this year that it was actually a privilege to help someone get out of this life. My heart is heavy with loss and grief, but not with regret.

I knew what my father wanted, so I was relieved to know that I could support his wishes.

My father spent his last 24 hours in a peaceful coma, and after several days of 24-hour care, we had time to sit down, hold his hand, and say goodbye.

He died just before breakfast on Monday morning. After waiting for the funeral home for the doctor to come, I went into the kitchen and ate a large bowl of porridge.

When I told some of my friends about this, they were really shocked.

"How do you eat then?"

Well, I was hungry.

(Laughter.) You know, sadness affected my sleep and concentration, but never my stomach. I was hungry all the time.

(Laughter) It's different for all of us and it's very important to acknowledge that.

So how can we support a grieving friend, colleague or neighbor if we don't talk about our own death or the death of a loved one?

How do we support someone who has lost someone suddenly, such as in an accident or suicide?

We tend to avoid them...

Not because I don't care, but because I don't know what to say.

As friends, we know we can't fix it, we can't take the pain away, so we say something to fill the awkward silence, and sometimes we regret what we've said.

An example would be, "At least he's not in pain anymore."

"At least you have memories."

"At least I don't have to pay for hospital parking anymore."

(Laughter) Really, I don't have to say anything.

it just has to be.

Be patient, understanding, and a listener.

And if you can't be any of those, please be the one who makes lasagna, curries, or casseroles. Because your offering will be greatly appreciated.

(Laughter) Last year, I attended 10 funerals and helped organize one of them.

All the ceremonies included a very solemn Greek Orthodox service, four Catholic Requiem Masses, and a garden party where friends' ashes were sprinkled over the garden and toasted.

(Laughter) I carried coffins, kissed, wrote letters, toasted with shots of ouzo.

I've been all black, all color, party dresses.

There was a big difference in the send-off, but one thing took solace for me, even though I was sometimes out of my comfort zone by doing things I had never done before. I knew it was what everyone wanted.

So what do I want?

I like to be organized, so I'm ambitious, I'm a registered organ donor, and I have an investment property.

All that remains is to plan my farewell, a big party, lots of champagne, colors, laughter and of course music to remember me.

thank you.

(applause)

So let me start my story.

So I injured the meniscus cartilage in my knee joint while playing soccer in college.

After that, I tore the ACL, which is a knee ligament, and developed knee arthritis.

I think a lot of people in this audience have a similar experience. By the way, I also married a woman who had exactly the same experience.

So this motivated me to become an orthopedic surgeon and see if I can't focus on solutions to the problems of continuing to play sports without restricting them.

So let me show you a quick video to help you understand what we're trying to explain.

Narrator: We all know about the risk of cancer, but there is one more disease that is destined to affect even more people. It's arthritis.

Cancer can take lives, but arthritis takes more lives by the numbers.

Assuming you live a long life, you have a 50% chance of developing arthritis.

And it's not just aging that causes arthritis.

A common injury can literally lead to decades of pain until the joint wobbles to a halt.

In search of a solution, we turned to engineering to design artificial components to replace worn-out body parts, but in the midst of the modern hustle and bustle about the potential of bionic bodies, shouldn't we stop and ask if there's a better, more natural way?

Consider another path.

What if all the replacements our bodies need already exist in nature or in our own stem cells?

This is the field of biological replacement, replacing worn parts with new natural parts.

Kevin Stone: So the mission is, how do we deal with these things biologically?

And let me talk about both what I have done for my wife and what I have done for hundreds of other patients.

The most common thing I hear first from my wife, and from my patients, especially those who are 40 to 80, 70+, is that they come in and say,

Not ready for joint replacement surgery. ”

So I inserted a human meniscal allograft donor for her directly into that [knee] joint space.

And [allograft] replaces [missing meniscus].

A human donor ligament was then inserted into that unstable ligament to stabilize the knee.

And for surface damaged arthritis, we performed a stem cell paste transplantation designed in 1991 to regenerate the articular cartilage surface and regain a smooth surface.

This is my wife's left knee pain, but now, 4 months later, hiking in Aspen, she's fine.

And it certainly works not only for my wife, but for other patients as well.

The girl in the video, Jenn Hudak, pictured in the other image, just won the Aspen Superpipe just nine months after she broke her knee and had a pasty knee implant.

With all this success, you may wonder why it's not enough.

The reason is that there are not enough donor cycles.

We don't have enough young healthy people to donate their tissues to us after falling off their bikes.

And tissues are very expensive.

Therefore, it cannot be a solution to spread biological tissue to the world.

But the solution is animal tissue. Because it is plentiful, inexpensive, and available from young, healthy tissue. But the barrier is immunology.

And the specific barrier is a specific epitope called the galactosyl or gal epitope.

Therefore, if animal tissue is to be transplanted into humans, it is necessary to find a way to remove the epitope.

So my story with animal tissues begins in 1984.

And I started with the beef Achilles tendon. Bovine Achilles tendon, which is type I collagen, is digested with acid and detergent to remove antigens and form a regeneration template.

The regeneration template is then inserted into the missing meniscal cartilage to regrow the meniscal cartilage in the patient's knee.

We are currently performing this surgery, which has been performed in over 4,000 cases worldwide, making it an FDA-approved and globally accepted method of meniscal regeneration.

It would be great if we could break down the organization.

But what happens to ligaments when you want an intact ligament?

You can't grind it in a blender.

In that case, I need to design an enzymatic wash to wash away or remove the galactosyl epitope with a specific enzyme. And we designed it in collaboration with Uli Galili and Tom Turek.

We call it the "gal stripping" technique.

What we are doing is humanizing the organization.

You can strip that tissue, humanize it (laughs), and then put it back in the patient's knee.

And we did it. Currently, we have harvested pig ligaments (large young, healthy tissues) and transplanted them into 10 patients in an FDA-approved trial. And one patient won the Canadian Masters Downhill Championship three times with what he called "pig's ligaments." So we know it works.

And extensive clinical trials on this tissue are currently underway.

So what's the next step?

How can we achieve a complete biological knee replacement, not just parts?

How can we revolutionize joint replacement surgery?

Now how to do this.

So what we're going to do is take articular cartilage from a young, healthy pig, strip it of its antigens, inject it with stem cells, and then put it back on the arthritic surface of the knee, stick it there, let that surface heal, and then create a new biological surface on the knee.

That's our biological approach at the moment.

I will reconstruct the knee using parts.

We will re-polish with a completely new surface.

But we also have other benefits from the animal kingdom.

There are benefits of walking for 400 million years.

We can take advantage of them.

You can use thicker, younger, better tissue than what you might have had if you had an injury to your knee or when you were 40, 50, or 60 years old.

It can be done as an outpatient procedure.

This is how biological knee replacement can be popularized in the world, as it can be stripped of its tissue very economically.

Welcome to Super Biologics.

Not hardware.

It's not software.

Bioware.

That's your version 2.0.

So I think I'll be going to an operating room near you soon. (laughter)

thank you very much.

(applause)

Today we will take you around the world in 18 minutes.

I'm based in the US, but let's start on the other side of the map, in Kyoto, Japan. Fifteen years ago, I lived with a Japanese family while doing part of my dissertation research there.

I knew from then on that I would encounter cultural differences and misunderstandings, but they suddenly appeared when I least expected them.

On the first day, I went to a restaurant and ordered green tea with sugar.

The waiter paused and then said, "We don't put sugar in green tea."

“I know,” I said. "I know this custom.

But I love sweet tea. ”

In response, he gave the same explanation, but more politely.

"I don't put sugar in my green tea."

"I understand that Japanese people don't put sugar in their green tea, but I would like to put sugar in my green tea," I said.

(laughter) Surprised at my persistence, the waiter took the matter up with the manager.

A long discussion soon ensued, and finally the manager came to me and said, "Sorry, we don't have sugar."

(Laughs) Well, I couldn't drink tea as I expected, so I ordered coffee and the waiter brought it right away.

Two bags of sugar were placed on the saucer.

My failure to prepare a cup of sweet green tea was not due to a simple misunderstanding.

This was due to a fundamental difference in our way of thinking about choice.

From my American point of view, if a paying customer makes a reasonable request based on her preferences, she has every right to have it met.

In the words of Burger King, the American way is to "live your life." Because, as Starbucks says, "happiness is in your choices."

(Laughs) But from the Japanese point of view, it is their duty to protect the ignorant, (lol) in this case the ignorant gaijin, from making the wrong choice.

To be honest, my way of drinking tea was inappropriate by cultural standards and they were doing their best to save face.

Americans tend to believe that they have reached some sort of culmination in the practice of choice.

They believe that choice, viewed through an American lens, is best suited to satisfy the innate and universal need for choice in all humans.

Unfortunately, these beliefs are based on assumptions that are not necessarily true in many countries and cultures.

Sometimes they don't even apply at US borders.

I would like to discuss some of these assumptions and the issues associated with them.

I hope that in doing so, you start thinking about some of your own assumptions and how they were shaped by your background.

First assumption: If the choice affects you, you should be the one making it.

This is the only way to maximize your tastes and interests.

it is essential for success.

In America, the primary place of choice is the individual.

People have to choose for themselves and sometimes stick to their beliefs regardless of what others want or recommend.

I call it "be true to yourself".

But will everyone benefit from taking such a selection approach?

Mark Lepper and I conducted a series of studies looking for answers to this very question.

In one study we did in Japantown, San Francisco, we brought British-American and Asian-American children aged 7 to 9 into a lab and divided them into three groups.

As the first group arrived, Miss Smith greeted them and presented them with six large stacks of anagram puzzles.

Children chose which pile of anagrams to build and which marker to write the answer with.

When the second group of children came in, they were taken into the same room and shown the same anagrams, but this time Miss Smith told them which anagrams to do and which markers to write the answers with.

Now, when the third group came in, they were told that their anagrams and markers had been chosen by their mother.

(Laughter) In fact, the children who were told what to do, whether it was Miss Smith or their mother, were actually given exactly the same activities that the first group of children were free to choose.

This procedure allowed children in all three groups to perform the same activity, facilitating comparison of performance.

These small differences in how activities were managed made a noticeable difference in activity performance.

Anglo-Americans wrote 2.5 times as many anagrams when they chose the anagram themselves than when they were asked to pick one by Miss Smith or their mother.

It doesn't matter who makes the choice, if the task is directed by someone else, that person's performance will suffer.

In fact, some children were visibly perplexed when they were told that their mothers had consulted them.

(Laughter) A girl named Mary said, "Did you ask your mother?"

(Laughter.) In contrast, Asian American children did best when they believed their mother chose them, second best when they chose them themselves, and worst when they were chosen by Miss Smith.

A girl named Natsumi approached Miss Smith as she was leaving the room, pulled her skirt and asked, "Can you tell her that you did what Mama said?"

First-generation children were strongly influenced by their immigrant parents' approach to choice.

For them, choice was not just a way to define and assert their individuality, but also a way to create community and harmony by following the choices of those they trusted and respected.

If they had a notion of being true to themselves, that self would most likely consist of groups rather than individuals.

Success was as much about pleasing the main characters as it was about satisfying one's own tastes.

Alternatively, we could say that individual tastes were shaped by the preferences of certain others.

Therefore, the assumption that we do best when our individual selves choose holds true only if that self is clearly separated from others.

In contrast, when two or more individuals consider their choices and their consequences to be closely related, they may amplify each other's success by turning their choices into collective acts.

Their insistence on self-selection can actually undermine both their performance and their relationships.

But that is exactly what the American paradigm requires.

It leaves little room for interdependence and the possibility of individual error.

It requires everyone to treat choice as a personal and self-determined act.

Those who grew up in such a paradigm may find it motivating, but it would be a mistake to assume that everyone grows up under the pressure of making their own choices.

A second assumption that conveys Americans' view of choice is:

The more options you have, the more likely you are to make the best choice.

So Wal-Mart with 100,000 different products, Amazon with 27 million books, and Match.com—what is it?--There are currently 15 million possible dates.

We're sure you'll find something that's just right for you.

Let's go to Eastern Europe and test this assumption.

Here I interviewed residents of former communist countries who were facing the challenges of transitioning to a more democratic and capitalist society.

One of the most interesting revelations comes not from answering questions, but from simple hospitality.

When participants arrived for the interview, I offered them a set of drinks. Coke, Diet Coke, Sprite, seven to be exact.

During the first session in Russia, one of the participants made a comment that really surprised me.

"Oh, but it doesn't matter.

It's all just soda. It's just one choice. ”

(Muttering) I was so shocked by this statement that I then offered all the participants the 7 types of carbonated drinks and asked, "How many ways are there of these?"

Again and again, they didn't perceive these 7 different sodas as 7 choices, but as 1 choice of soda or no soda.

When they served these seven sodas plus juice and water, they realized it was just three options: juice, water, and soda.

Compare this to many Americans' ardent love for a particular brand, not just a particular flavor of soda.

As you know, studies have repeatedly shown that you can't really tell the difference between Coke and Pepsi.

Of course, you and I both know that Coke is the better choice.

(Laughter) For modern Americans, who are exposed to more choice and choice-related advertising than anyone else in the world, choice is as much about who you are as what the product is.

Combine this with the assumption that more options are always better. Also, every choice matters, because there is a group of people who value every little difference.

But for Eastern Europeans, the sudden availability of all these consumer products on the market was a deluge.

They were flooded with options before protesting that they didn't know how to swim.

When asked, "What words and images do you think of when you think of choice?"

Grzegosz from Warsaw said: "Oh, it's scary for me.

It turns out that there are some dilemmas.

We are used to not having a choice. ”

In response to how he felt about the new consumer market, Bodin, from Kiev, said:

You don't need everything there. ”

A sociologist from the Warsaw Research Service said, "The older generation jumped from nothing to the options around them.

They weren't given the opportunity to learn how to react. ”

Tomasz, a young Polish man, said, "I don't need 20 different chewing gums.

I'm not saying there are no options, but many of these options are highly artificial. ”

In practice, many choices are made between things that are not that different.

The value of choice depends on the ability to recognize the differences between alternatives.

Americans spend a lifetime training to "find the difference."

They practiced this from an early age, leading them to believe that everyone must be born with this ability.

In fact, all humans share a basic need and desire for choice, but not all people find their choices in the same places or to the same extent.

The selection process can be confusing and frustrating when you don't know how one option differs from another, or when there are too many options to compare and contrast.

Instead of making better choices, we are overwhelmed and sometimes even afraid of choices.

Choices no longer offer opportunities, they impose constraints.

It is not a sign of liberation, but a sign of suffocation by meaningless details.

In other words, choice, when faced with people who are ill-prepared for it, can turn out to be the exact opposite of what America stands for.

But it's not just other people elsewhere who are feeling the increasing pressure of choice.

Americans themselves are finding that unlimited choice is more appealing in theory than in practice.

We all have physical, mental, and emotional (lol) limits that make it impossible for even the grocery store to handle every choice we encounter throughout our entire lives.

A lot of my research shows that when people are given 10 or more options when making a choice, whether it's in healthcare, investing, or other important areas, they make the wrong decisions.

Still, many of us believe that we should make all our choices and explore more choices.

From this emerges a third assumption, perhaps the most problematic. "Never say no to a choice."

To find out, let's go back to the United States.

Then cross the pond into France.

A young Chicago suburban couple, Susan and Danielle Mitchell, were about to have their first child.

They had already chosen the name Barbara after her grandmother.

One night when Susan was seven months pregnant, she went into labor and was rushed to the emergency room.

The baby was delivered by caesarean section, but Barbara suffered cerebral anoxia, a lack of oxygen to her brain.

Unable to breathe on her own, she was put on a respirator.

Two days later, doctors gave the Mitchells a choice. Either take Barbara off life support (which would kill her within hours) or keep her on life support (which could still kill her within days).

If she survives, she will remain in a permanent vegetative state, unable to walk, speak, or interact with others.

what do they do?

what do parents do?

In a study I conducted with Simona Botti and Christina Orfari, I interviewed American and French parents.

They were all going through the same tragedy.

In both cases life support was removed and the infant died.

But there was a big difference.

In France, doctors decided if and when to take off life support, but in the United States the final decision was left to the parents.

we wondered. Does this affect how parents deal with the loss of loved ones?

It turns out that it will.

Even one year later, American parents were more likely than French parents to express negative emotions.

French parents were more likely to say things like: "Noah was only here for a short time, but he taught us a lot.

He gave us a new perspective on life. ”

American parents were more likely to say things like "What if? What if?"

Another parent said, "I feel like they are torturing me on purpose.

How did they let me do that? ”

Another parent said, "I feel like I played the role of the executioner."

But when American parents were asked if they wanted a doctor to make the decision, they all said "no."

Even though they felt trapped, guilty, and angry for making that choice, they couldn't imagine changing that choice to something else.

In many cases, they even became clinically depressed.

These parents could not think of giving up their choice. For to do so would go against everything they have been taught and come to believe about the power and purpose of choice.

In her essay The White Album, Joan Didion wrote, "We tell ourselves stories to live.

We interpret what we see and choose the most viable among multiple options.

We live solely by imposing narrative lines on disparate images and by ideas learned to freeze the shifting illusions of our actual experience. ”

The story Americans tell, the story on which the American Dream depends, is a story of endless choices.

This story promises many things: freedom, happiness, success.

It puts the world at your feet and says, "You can have anything and everything."

It's a great story and I can understand why they don't want to revise it.

But if you look closer, you start to see holes, and you start to realize that this story can be told in many other ways.

Americans have tried many times to propagate their ideas, believing that they would or should be welcomed with an open mind.

But history books and daily news tell us that it doesn't always work out that way.

The phantasmagoria, the actual experiences we try to understand and organize through stories, vary from place to place.

There is no single narrative that meets the needs of everyone, everywhere.

Moreover, Americans themselves could benefit from incorporating new perspectives into the stories that have long driven their choices.

Robert Frost once said, "It is poetry that is lost in translation."

This suggests that what is beautiful and moving, what offers a new perspective, is not conveyed to people who speak different languages.

However, Joseph Brodsky said, ``What you get from translation is poetry,'' suggesting that translation can be a creative and transformative act.

When it comes to choice, you gain far more than you lose by working on many translations of the story.

Instead of replacing one story with another, you can learn from and enjoy the many versions that exist and have yet to be written.

No matter where we come from or what your story is, we all have a responsibility to open ourselves up to a wider range of what our choices can do and what they can represent.

And this does not lead to paralyzing moral relativism.

Rather, it tells you how and when to act.

It brings us much closer to realizing the full potential of choice, inspiring hope, and realizing the freedom that choice promises but doesn't always deliver.

Once we learn to speak to each other, even through translation, we can begin to see choice in all its strangeness, complexity, and compelling beauty.

thank you.

(Applause) Bruno Giussani: Thank you.

Ms. Sheena, you have a detailed career that is not written in the program book.

But now it's clear to everyone in this room. you are blind

And one question everyone has is: For most people, choice is an activity associated with visual inputs such as aesthetics and color, so what impact does that have on the study of choice?

Sheena Iyengar: Well, it's funny to hear that. Because one of the interesting things about being blind is that observing how a sighted person makes choices really gives you a different perspective.

And like you said, there are a lot of very visual options these days.

Well, as you can imagine, I have to rely on other people's suggestions, so I get pretty frustrated with choices like which nail polish to apply.

And I can't decide.

So, one time I was in a hair salon trying to decide between two very bright shades of pink.

And one of them was called "ballet slippers".

And another was called "Adorable".

(Laughter) So I asked these two women, and one of them said, "Well, you should definitely wear ballet shoes."

"Yes, it's a very classy pink."

"Okay, great."

The other lady told me to wear "Adorable".

"How are you feeling?"

"It's a gorgeous pink color."

So I asked them, "So how do you tell?"

what's different about them? ”

And they said, "Well, one is elegant, the other is glamorous."

ok, got it.

And the only thing they agreed on is that if I could see them, I would be able to clearly distinguish them.

(Laughs) So I wondered if it was influenced by the name or the content of the color, so I decided to do a little experiment.

So I took these two bottles of nail polish to my lab and peeled off the labels.

And I brought the women into the lab and asked, "Who would you choose?"

Fifty percent of the women accused me of pranking them by putting the same color nail polish in both bottles.

(Laughter) (Applause) At this point, you're starting to wonder who really did the trick.

Well, of the women I could tell them apart, I chose "Adorable" if the label was off and "Ballet Slippers" if the label was on.

As far as I know, roses with other names probably look different and probably smell differently.

BG: Thank you. Sheena Iyengar. Thank you Sheena.

(applause)

I am a marine toxicologist and I am very concerned about the Gulf, especially the massive use of toxic dispersants, the colexit.

For quite some time I have been researching marine pollution, its effects on marine life, especially on marine mammals.

After all, marine mammals are at the top of this food chain, into which we wash millions of tons of toxic substances each year.

And they are showing signs of that.

Sorry for such a sad slide, but not everything is so happy, especially in my job.

Their bodies contain hundreds of compounds, all kinds of compounds, and it's amazing.

And they die in the tens of thousands around the world on a fairly regular basis.

About one-third of them are predicted to be extinct within about 30 years.

So my project is along the North West Atlantic Ocean.

It's called Seals as Sentinels.

We track contamination at the top of the food web, marine mammals and fish.

This is a regional scale ecotoxicology study.

We are working on many compounds, but recently we are very interested in flame retardants. Brominated flame retardants are found in many of the things we use in our daily lives, from the cushions in our chairs to the plastic housings of our computers and televisions.

So we track how these substances flow from our products into the ocean, where they end up sinking.

As these products age, they condense into dust that is discarded and sent to landfills, making the path very complex.

They end up in wastewater treatment plants.

As you know, we throw out billions of computers and TVs every year.

And they are sent to an e-waste landfill.

And they all enter the surface waters and eventually reach the ocean, the final sinking ground.

Therefore, in our study, we found, as expected, that harbor seals contain significantly higher concentrations of these flame retardants in their bodies.

and we reported this.

This led to a ban on a neurotoxic flame retardant called Deca in my home state of Maine, which was phased out nationwide late last year.

But we said, on the bright side, harbor seals won't be blazing at least anytime soon.

So as a toxicologist myself, I was so intrigued that I donated blood to my lab and said, 'Okay, let's do it.

113 compounds were detected in my blood.

And if any of you do this, you'll probably find a similar profile, or cocktail as they say.

But for some reason I received a large amount of flame retardant material.

And I want to point out the levels, Americans have 10 to 40 times higher levels of these compounds in their bodies than Europeans.

why? That's because everything is made flame-retardant and the regulations on toxic chemicals are weak.

But surprisingly, I am one of the high end individuals.

I'm lucky

But I thought that if there was a fire, I might be the last to light it.

(Laughter) Anyway, here's the problem - and that's the problem we're seeing in the Gulf today - we're not properly regulating chemicals in this country.

We hardly regulate them.

And we let the industry run the show.

And Jackie Savitz spoke this morning about big oil and propaganda and how we're being brainwashed by their lies and more.

Well, what we're dealing with here is Big Chemical.

And we are allowed to keep our trade secrets, so we don't even let the ingredients out.

Furthermore, no health and safety data is provided, so it cannot be regulated before it hits the market.

In other words, you are innocent until proven guilty.

The burden of proof is not on the manufacturer.

So I was invited to go to the Gulf in May.

I went there on a preliminary study to find out about the dispersant and how it enters the water column etc.

And I was told I was the only toxicologist stupid enough to ever go into the water, and I did.

And we jumped into the slicks without even HazMat gear.

And then I got sick.

Two days later I was attacked by a severe sore throat.

I felt my throat burn.

But it passed.

And what we saw in the water during the descent, that really struck me and has haunted me ever since - because I saw the oil droplets disperse.

And as they make their way down, they catch all sorts of plankton and, you know, run into tiny pieces of life that feed on herring-type fish, which are plate-eaters.

And if you go down through the water column, you might just see the death nest.

Well, they say they initially approached the issue as a trade-off between wetlands and ocean depth.

At the time, I did not agree with that decision. Still do not know.

The decision was to protect the swamp.

Once the oil gets into the swamp, it cannot be removed.

And, as you know, the response to actually recovering oil has been very slow until recently.

It's gotten pretty aggressive.

Here's an Exxon slide showing what happens, scenarios, and trade-offs.

In other words, you can see that there is oil on the surface.

You can see it growing on the mangroves, but it doesn't hurt corals or seaweeds.

Now consider another scenario.

If dispersed, seagrass and corals would be hit hard, but mangroves would be protected.

So this is like going to the eye doctor for me, okay?

Is one or two better?

(Laughter) The problem is that we're throwing out so much material that it's going up to two million gallons in no time.

And then there is the issue of feathers.

what feather?

It turned out that there was smoke.

An independent researcher found it.

And then there is the pressing and thorny issue of human health, with reported effects on human health.

And indeed, one federal official said heat stress was probably to blame. So...

Having been in the water for a short time, I can tell you that this is not heat stress.

The water is emitting large amounts of volatile petroleum gases, as well as the Corexit, which contains solvents.

So it's not reasonable at all.

So what do we have? The BP show will be held.

Our officials complained about Corexit, the most toxic product among dispersants.

But heck, they were still using it and were using the most toxic one, 9527, until supplies ran out.

It is now 9500.

9527 contained 2-butoxyethanol, which caused internal bleeding.

By the way, we know that from the Exxon Valdez spill.

So what we're doing is spraying the oil spill site with a compound that contains a petroleum solvent.

Does this make sense?

This is how it works.

And I want to show you this cute little thing that happens here.

It's micelle.

Micelles form around the oil.

And the first thing that happens is that the solvent penetrates the oil, the lipid membrane, allowing the surfactant to penetrate there.

Surfactants, similar to those used in fast food wrappers, grip around the oil droplets to form tiny little droplets with neat edges of surfactant.

The thing to remember about micelles (little floating spheres of toxins) is that they are there to communicate.

They're like the FedEx guys.

And even if you're a fish and didn't get the glob in the morning, you're going to get it in the afternoon. Because they have your number.

So from a toxicology point of view, this is really bad. This is because Corexit and dispersed oils are much more toxic together than either alone.

And usually the exposure is a synthetic exposure.

As I said earlier, the dispersant's job is to destroy the lipid membrane.

The solvents they contain do it very efficiently.

So they destroy the lipid membranes of our body, starting with the cells of the skin and the cells of the organs.

So it actually speeds up the oil entering the body easily and easily.

Oil contains hundreds of hydrocarbon and other compounds that are toxic to every organ of the body.

Therefore, combining dispersants results in highly synergistic combined toxicity.

Corexit also contains petroleum solvents and many other toxic compounds.

And I am part of the chat group. A national group of toxicologists and chemists. They're basically trying to figure out what's in this substance, what it does, what the interactions of these chemicals are, most of which we don't know, and what their byproducts are, usually more toxic than the parent compound.

Therefore, Corexit 9500 was found to contain heavy metals, arsenic and chromium. Arsenic is at levels high enough to cause carcinogenicity.

Here's what we have to see, you know, a silly safety data sheet that doesn't say much.

And now they've been forced to publish the ultimate list of everything Corexit contains.

And what a lot of things are missing.

Derivatives, derivatives, these are a large group of very many compounds, sorbitans.

Then we get to the solvent, the petroleum distillate. There are hundreds of them.

they are not specified. why?

Another trade secret.

That's all BP and Nalco, who run the show, have to do.

So far, these ingredients have not been published, and toxicologists are really out of their minds because they can't reliably predict what the interactions and toxic consequences will be.

But as we all know, the 33 wildlife sanctuaries have so much wildlife, so many fish, so much diversity that we're in so much danger.

So we know from previous spills.

And part of this is just part of my bad dreams.

And I am grateful to be able to vent some of my anguish to you.

What we do know is that corals will be hit hard.

This is a study done on the Tasmanian coast of Australia.

As we all know, corals are home to about a quarter of all marine species.

And fertilizer is at zero percent because of Brexit and oil.

Oil alone is 98% fertilizer.

They are therefore a very sensitive species to this combination.

Here is another group.

I could easily see myself in the water column.

Plankton and plankton eaters are little herring fish that pass through the water column with their mouths open, feeding indiscriminately and just eating this brown pudding of toxic substances.

And other studies have found this to be a highly toxic mixture.

Look at the oil Coreexit causes deaths at much lower doses than oil alone.

That's probably about all we know about toxic effects.

But my bad dreams are like this.

Piscivorous fish, cedars, groupers, amberjacks, and those larger fish, tuna and sharks will also be attacked by this.

And Ella is very sensitive.

The respiratory system is very sensitive.

Consider that when Corexit hits the membrane, it clogs the gills, resulting in a so-called chemical pneumonitis in these animals trying to inhale the compound.

It also causes internal bleeding when ingested.

I am very concerned about that because I work with air-breathing mammals, and how they are exposed is that every time they come to the surface to breathe, they inhale volatile gases.

And what ends up happening is that pneumonia sets in and damages the liver, kidneys and brain.

Corexit transports oil to every membrane and every system in the body.

It also suffers from a variety of unpleasant effects, such as eye and mouth burns, skin ulcers and lesions.

And personally, I don't think we're starting to see the effects of this spill on Gulf wildlife yet.

We started hypothesizing. what do we know?

What do you think the nutrient cascade will be?

That means someone gets annihilated and everything on it eating them crashes.

So we thought, it's a simple thought process...

Clearly plankton, plankton, and that's about it from what we've seen.

And it turns out that we are not very good at understanding this.

This is what the Exxon Valdez scientists thought would happen, this trophic cascade that loses kelp, herring and other fish and rises.

They believed that killer whales would eventually reach the top of this waterfall.

And here's what actually happened: Much more complex and more specific.

In fact, the kelp and barnacles attached to the rocks were destroyed by a combination of colexit and petroleum.

They were replaced by alien species that had less strength to hold rocks.

A storm is coming.

they tore the rock.

And this was the entire food web for the sea duck.

As you know, about 300,000 sea ducks were lost in the Exxon Valdez spill and have yet to return.

So we start an independent study.

And being independent does not mean being lonely. I mean independent in the sense that we are not bound by the kind of crime scene secrecy that is currently happening in the Gulf region.

But we are going to actually assess the detrimental impact, and we need so many partners to do this intelligently.

Several partners are lined up.

And Dave Gallo signed on.

Silvia is here

And I hope some of you guys can help us out.

My question to you is why shouldn't we know?

Do we have no right to know?

Indeed, we have a right to know what losses we are experiencing in the Gulf.

And my hope is that when it comes to the Gulf Awards, we know the truth.

Whatever it is, let me tell you the truth.

And to get there, you have to make an assessment.

So thank you for being here. thank you.

(applause)

For a while all I have to do is project something onto the screen of your imagination.

We are on the west coast of Japan in the 17th century. Near midnight, a little crumpled monk rushes to the top of a small hill.

He reaches a small hill dripping with water.

He stands there looking out over Sado Island.

And he crosses the sea and looks up at the sky.

Then he says very quietly to himself, "[The sea is rough] [extending to Sado] [the Milky Way]."

Basho was a wonderful person.

He said more in fewer words than any human being I have ever read or spoken to.

In seventeen syllables, Basho captures the near-impossible beauty of our home galaxy, juxtaposed with seas raging by past storms, with millions of stars, perhaps hundreds, hundreds—who knows how many—planets, and perhaps even the ocean we shall eventually call Sylvia.

As he neared death, his disciples and followers kept asking him, "What's the secret?"

How can you make a beautiful haiku so easily? ”

And towards the end, he said, "If you know a pine tree, go to the pine tree."

that was it.

(Laughter) Sylvia said that we have to use all our abilities to know the ocean.

If you want to know the sea, you have to go to the sea.

And what I want to tell you a little bit about today is that new capabilities that are not yet quite routine will greatly change the relationship, or interaction, between humans and the oceans.

I hope so.

There are some important points.

One is that the ocean is central to the quality of life on earth.

Second, there are bold new ways to study the oceans that we haven't taken full advantage of.

And finally, these bold new ways we, as a community, are exploring will change the way we look at our planet, our oceans, and ultimately, perhaps, the way we value and manage the planet as a whole.

So what scientists do when they start their research is start with the system.

They define what the system is.

This star system is not the Chesapeake Bay.

Not the Kuril Arc. Not the entire Pacific.

It is the whole earth, the whole earth, the continents and the oceans together.

That's the system.

And fundamentally, our challenge is to optimize the benefits and mitigate the risks of life on a planet powered by only two processes, two sources of energy (one of which is the sun): winds, waves, clouds, storms, and photosynthesis.

The second is internal energy.

And these two are at war with each other almost continuously.

Mountain ranges, plate tectonics move continents and form mineral deposits.

A volcano erupts.

That's the planet we live on.

It's very complicated.

I don't expect you to see all the details here, but what I want you to see is that this works almost continuously in the ocean, about 10 percent of the processes that have been going on for the last 4 billion years.

This is a very old system.

And they've all co-evolved.

What does that mean?

they interact all the time.

They all interact.

Thus, the complexity of this system we are looking at is that the top is driven by the sun, mostly the top, and the bottom partly driven by heat input from the bottom and other processes.

This is very important. Because this is the system, the crucible, from which life on Earth originated, and now is the time for us to understand it.

we have to understand that.

That's one of the themes Silvia reminds us of. It's about understanding this ocean of ours, this basic life support system, the dominant life support system on Earth.

See this complexity here.

This is just one variable.

If you can see the complexity, you can see how small eddies, how large eddies, and how much movement there is. It's just sea surface temperature, but it's very complicated.

Now, with the layers added, 200-300 other processes all interacting, partly as a function of temperature and partly as a function of all other factors, complete a very complex system.

That is our challenge, to understand this system in new and surprising ways.

And there is urgency in this.

Part of the urgency, of course, comes from the fact that one billion people on the planet are currently undernourished or hungry.

And part of the problem is with Cody, who's 16 here, and I have permission to give you this phone number.

Forty years from now, when he's Nancy Brown's age, there will be another 2.5 billion people on the planet.

You can't just look at the ocean and solve all your problems, but without a much more thorough understanding of the basic life support systems of this planet, the stresses we'll face, and the stresses Cody will face, and even Nancy, who will live to be 98, would have a really hard time coping.

Now let's talk about the importance of the ocean from a different perspective.

Look at this diagram. Warm seas are shown in red, cold seas in blue. On the continent, bright green is vegetation growth, and olive green is vegetation withering.

And in the lower left corner is a clock that ticks from 1982 to 1998 and then cycles again.

What we can see here is that the growth rhythms of the vegetation subsets that feed on the continent are directly linked to the rhythms of sea surface temperature.

Oceans control, or at least significantly influence, the growth, drought, and rain patterns of continents.

So people of Kansas, people who live in the wheat fields of Kansas, need to understand that the ocean is central to them too.

Another complication is that we are in the Age of the Ocean.

I'm going to put a structural plate on top of this.

The age of the oceans and plates will give rise to entirely new phenomena that we have heard about at this conference.

And I will share some very high definition videos that I have collected in real time.

Seconds after this video was shot, people in Beijing, people in Sydney, people in Amsterdam, people in Washington D.C. were watching it.

You've probably heard of hydrothermal vents, but another discovery is that there are vast reservoirs of microbial activity in the deep ocean floor. This was just discovered and there are few ways to study it.

Some estimate that the biomass contained in these microbes living in seafloors and subterranean sediments and cracks is comparable to the total living biomass on the surface of the earth.

This is an amazing insight and we only recently learned about it.

This is very, very exciting.

From a pharmaceutical perspective, it could be the next rainforest.

We know little or nothing about it.

Marcel Proust once said, “The true voyage of discovery does not consist, perhaps, in seeking new territories, but in having new eyes, new ways of looking at things, new ways of thinking.”

And many of you remember the early days of oceanography when you had to use what was out of the box.

And it wasn't easy. It wasn't easy back then.

I'm sure some of you remember this.

And now we have a very powerful set of tools: ships, satellites, moorings.

But they don't quite get it. They don't give us anything we need.

And the program I wanted to talk about here is funded and includes self-driving cars like the one driving across below this image.

Modeling: On the right we have a very complex computational model.

There is a new type of mooring on the left. More on this later.

And based on some points, we can see that the ocean is complex and central to life on Earth.

They are changing rapidly, but they are unpredictable.

And the models needed to predict the future don't have enough data to improve.

Your computing power is amazing.

But without data, those models can never predict.

And that's what we really need.

They are dangerous for many reasons, but we feel that OOI, this ocean observation initiative, now funded by the National Science Foundation, has the potential to really change things.

And the goal of this program is to use widely accessible, interactive telepresence to initiate an era of scientific discovery and understanding across and within ocean basins.

It's a new world.

We exist freely across the oceans and communicate in real time.

And this is what this system has to do with some locations in the southern hemisphere shown in these circles.

There are four sites in the northern hemisphere.

Most of them are not detailed here, but the West Coast one in the box is called the regional scale node.

It was once called Neptune.

And let me show you what's behind it.

Fiber: The next generation method of communication.

These have visible copper tips.

It can transmit power, but its bandwidth is in tiny threads smaller than a hair in diameter.

And this particular set here is capable of transmitting around 3-5 terabits of data per second.

That's a staggering amount of bandwidth.

And this is what the planet looks like.

We're already lacing up like we're wearing fiber optic corsets, so to speak.

It looks like this.

And the cables actually run from continent to continent.

This is a very powerful system and most of our communication consists of this system.

This is the West Coast system I'm talking about. It coincides with the tectonic plate, the Juan de Fuca tectonic plate.

And across this volume – the upper ocean, the ocean floor, and below the ocean floor – it will provide abundant power and unprecedented bandwidth.

Bandwidth and power and different processes at work.

This is what one of these primary nodes looks like, like a substation with power and bandwidth that can be distributed over an area the size of Seattle.

And what kind of science can be achieved depends on the different scientists who want to participate and who can develop instruments.

They bring it and link it.

In a way, it's like spending time with a telescope, except you have your own dedicated port.

All areas of earth and ocean sciences, including climate change, ocean acidification, dissolved oxygen, carbon cycle, coastal upwelling, and fisheries dynamics, are covered simultaneously in the same volume.

So anyone who joins later can simply access the database and write down the necessary information about what happened.

And this is just the first of them.

We launched this in collaboration with our Canadian colleagues.

Now I would like to take you inside the caldera.

On the left is a large volcano called Axis Seamount.

It then descends to the axis seamount using animation.

Here's what this system we're funding to build at the moment would look like.

very powerful.

It is an elevator that constantly moves up and down, but it is controlled by ground personnel.

Alternatively, you could transfer control to someone in India or China and they'll take over for a while, as everything will be directly connected through the internet.

Massive amounts of data will be pouring onto land, all available to anyone interested in using it.

This makes it much more powerful than having one ship in a single location and then moving to a new location.

We are flying over the bottom of the caldera.

There are many robotic systems.

If it's an experiment, I have a camera that I can turn on and off at will.

The kind of systems that will be there, the kind of equipment that will be on the ocean floor, if you can read what's there, consists of cameras, pressure sensors, fluorometers, seismometers.

It's all kinds of tools.

Well, the mound there actually looks like this.

It's actually like this.

And this is the kind of activity you can see in high-definition video. Due to the very high bandwidth of these cables, 5 to 10 stereo HD systems can be run in series and also controlled by robotic technology from land.

very very powerful.

And these are the things we are funded to do today.

So what can we actually do tomorrow?

We are riding the wave of technology opportunity.

New technologies are emerging across the field around oceanography, and we are incorporating them into oceanography, making oceanography even more magical through their fusion.

Modern robotic systems are truly incredible.

And we will be bringing all kinds of robots into the ocean.

Nanotechnology: This is a small generator.

It's smaller than a postage stamp, and can generate electricity just by attaching it to your shirt as you move.

It generates electricity just by moving.

There are many things that can be used continuously at sea.

Imaging: Many people know more about this sort of thing than I do, but stereo imaging at four times the resolution of HD will be commonplace within five years.

And this is magic.

As a result of the human genome process, we are in a position to actually sample oceanic events, such as volcanic eruptions.

Liquids are pumped into one of these systems, a button is pressed, and genomic signatures are analyzed.

And it will soon travel to land.

Thus, the volume of the ocean will become transparent with continuous data not only on the physics and chemistry, but also on the basis of the food chain.

Grid Computing: The power of grid computing will be amazing here.

We will soon be using grid computing to do almost everything, including data and all the adjustments that come with it.

Power generation comes from the ocean itself.

And the next generation of fibers will be truly magical.

It goes far beyond what we currently have.

Therefore, the presence of power and bandwidth in the environment will allow all these new technologies to be integrated in unprecedented ways.

So I think in 5-7 years we'll be fully present all over the ocean, all of them connected to the internet, and we'll be able to reach so many people.

Bringing power and bandwidth to the ocean will dramatically accelerate adaptation.

Here is an example.

When an earthquake occurs, new, never-before-seen microbes emerge from the ocean floor in large numbers.

We have a way of dealing with it, a new way.

From the seismic activity you are seeing here, I have determined that the top of that volcano is erupting and will dispatch troops.

What is an army? The military, of course, are self-driving cars.

And they dive into an erupting volcano.

They sample fluids emerging from the ocean floor during eruptions, which contain microbes that have never appeared on the surface of the Earth before.

They release it to the surface, where it floats, is retrieved by autonomous aircraft, and returned to the lab within 24 hours of the eruption.

This is doable. All the pieces are there.

Lab: Many of you have probably heard what happened on September 7th.

Some New York City doctors removed the gallbladder of a French woman.

If I can show you something interesting, you can do great work on the bottom of the sea, and it will be shown on live TV.

So you can bring a whole new world of telepresence across the oceans.

This showed us the ocean floor, but the goal here is to be able to interact with the ocean in real time from anywhere on Earth.

It's going to be amazing.

We want to show you what we can bring to your classroom, and indeed what we can bring to your pocket.

Many people haven't thought about this yet, but the ocean is in your pocket.

It won't take long. It won't take long.

Now, if you'll allow me, I'll leave you with a few words from another poet.

In 1943, T.S. Eliot wrote "Four Quartets".

He won the Nobel Prize in Literature in 1948.

In "Little Gidding" he says - this is for mankind, I think, but definitely for the TED conference and Sylvia - "We will never stop exploring, and the end of all our explorations will be to arrive where we started, only to know where we started, arriving through unknown and memorable gates, arriving where the last thing on earth to discover was where it began."

At the source of the longest river, the voice of a hidden waterfall, unknown for not seeking, was half audible in the stillness beneath the ocean waves. ”

thank you.

(applause)

I would like to begin today with two observations about humanity.

The first observation may seem very obvious, but it turns out that our species, Homo sapiens, is actually really, really smart, that is, insanely smart. All of you are doing things that no other species on Earth currently does.

And of course, this isn't the first time you've noticed this.

Of course, we are not only smart, but we are also a very vain race.

Therefore, we like to point out the fact that we are smart.

You know, you can rely on almost every sage, from Shakespeare to Stephen Colbert, to point out the fact that man is sublime in reason, infinite in ability, superior to anything else on earth in all things intellectual, and so on.

But, of course, there is another observation about humanity that I would like to draw a little more attention to. It's the fact that humans can be incredibly, incredibly stupid when it comes to some aspects of decision-making, even though they're actually very smart, and sometimes have unique smarts.

Now I see many smiles there.

please do not worry. I'm not blaming anyone in particular for your own mistakes.

But of course, the last two years alone have seen unprecedented examples of human incompetence.

And we've seen our custom-made tools explode before our eyes to extract resources from the environment.

We have seen financial markets of our own making, supposedly infallible financial markets collapsing before our very eyes.

But I don't think either of these two embarrassing examples highlight what I find most embarrassing about human error. That said, I like to think that the mistakes we make are actually the result of some bad apples or some truly failed blog-worthy decisions.

But what social scientists are really learning is that most of us actually make very specific mistakes when put in certain situations.

The mistakes we make are actually predictable.

I will make it again and again.

And indeed they are immune to much evidence.

Even if we receive negative feedback, we tend to make the same mistakes the next time we face a particular situation.

So this was really baffling to me as a humanities scholar.

What interests me most is how a species as smart as humans can consistently make such terrible and consistent mistakes.

You know, we're the smartest people in the world, so why can't we figure this out?

Where do our mistakes really come from, in a sense?

After thinking about this for a bit, I see several different possibilities.

One possibility is that, in a way, it's not really our fault.

We're a clever species, so we can actually create environments that are so complex that even if we did, we wouldn't be able to understand them.

We create highly complex financial markets.

We create mortgage terms that we can't really deal with.

And of course, in a way it stands to reason that we can actually mess up certain things if we're put in an environment where we can't handle it.

If this is true, the human error problem will be very easy to solve.

In practice, we would say, "Okay, let's figure out what kinds of technologies and bad environments we can't handle. Let's get rid of them, design things better, and we should be the noble species we expect ourselves to be."

But another possibility I'm a bit more concerned about is that maybe our environment isn't messed up.

Maybe we're just designing it wrong.

This is a hint we got from observing how social scientists learned about human error.

And what we see is that people tend to keep making the exact same mistakes over and over again.

I feel like we might be made to make mistakes in some ways.

This is a possibility that worries me a little more. Because it's not really obvious how to deal with it if it's us who are confused.

We may need to accept the fact that we are prone to making mistakes and design around it.

This is the question my students and I wanted to answer.

How can you tell the difference between Possibility 1 and Possibility 2?

What we need is a population that is basically smart and can make a lot of decisions, but has no access to the systems that we have or anything that can confuse us, no human technology, no culture, maybe even no human language.

That's why we relied on them here.

They are one of the people I work with. This is a brown capuchin monkey.

They are New World primates, meaning they split from the human branch about 35 million years ago.

I mean, your great, great, great, great, great, about five million greats out there, and your grandmother was probably just like Holly here, a great, great, great, five million greats great-grandmother out there.

You know, take comfort in the fact that this guy here is really a distant, albeit evolutionary, cousin.

The good news about Holly, though, is that she doesn't really have the same kind of technology that we do.

You know, she's a clever and very clever creature, even a primate, but she lacks all the elements that we thought might confuse her.

So she's the perfect test case.

What if we put Holly in the same context as humans?

Will she make the same mistakes we do?

Doesn't she learn from them? and so on.

So this is kind of what we decided to do.

A few years ago my students and I were very excited about this.

We said, okay, let's throw the problem at Holly and see if she messes up these things.

The first question is where to start.

Because it's great for us, but bad for humans.

We make many mistakes in different situations.

You know, where do we actually start?

And since we started this work around the time of the financial collapse, when foreclosures were in the news, we said, well, maybe we should actually start in the financial space.

Perhaps we should take a look at the financial decisions of monkeys and see if they do the same kind of stupid things that we do.

Of course, then we face a second, slightly more methodological problem. What you may not know is that monkeys don't actually spend money. I know you haven't met them.

But this is why they don't stand in line behind you at the grocery store or ATM. You know, they don't do things like this.

Well, I ran into a bit of a problem here.

How are you going to ask a monkey about money when he's not actually spending it?

So we said, well, actually, maybe we should just suck it up and teach the monkey how to spend money.

that's what we did.

What you're looking at here is actually the first unit of non-human currency that I know of.

We weren't very creative when we started doing these studies, so we just called it tokens.

But this is the unit of currency that the monkeys at Yale University were taught to actually use to buy different foods against humans.

It doesn't look like much, but it really isn't.

Like most of our money, it's just a piece of metal.

As anyone who has taken currency home from a trip knows, it's actually pretty useless once you get home.

It was useless to monkeys at first until they figured out what they could do with it.

When we first gave it to them in their enclosure, they actually picked it up and stared at it.

They were such strange things.

However, the monkeys soon realized that these tokens could actually be given to various humans in the lab for food.

So we see one of our monkeys, Mayday, doing this here.

This is kind of the point where A and B are a little bit more interested in her these things - I don't know.

There was a waiting hand from the human experimenter, and Mayday quickly realized that humans apparently wanted this.

Hand it over and receive your food.

It turns out that all of our monkeys, not just Mayday, are great at trading tokens with human salesmen.

So here's a quick video showing what this looks like.

It's Mayday here. She will trade tokens for food and happily wait to get the food.

I think this is Felix. he is our alpha male. He is great in a way.

But he too waits patiently, gets food and moves on.

So monkeys are very good at this.

They can do this surprisingly well with little training.

We just let them pick this up themselves.

The question is, is this like human money?

Is this a market at all, or are we just doing some weird psychologist trick that makes us look smart to monkeys but really isn't?

So we said, if this was really their currency, if they were really using it like money, what would the monkeys voluntarily do?

Well, one might actually imagine they would do the sort of clever things they do when humans start exchanging money with each other.

Getting them to pay attention to prices and purchase amounts can be like tracking monkey tokens.

Do monkeys do this?

Thus our monkey market was born.

How this works is that our monkeys usually live in social enclosures in a kind of big zoo.

When they wanted a snack, we actually let them escape to a little smaller enclosure where they could go into the market.

Once in the market, it was actually a lot more fun for the monkeys than most human markets. Because when the monkeys enter the market door, a human can hand them a big wallet full of tokens and actually trade the tokens with one of two different human salesmen here who can actually buy things.

The salesman was a student in my lab.

They were dressed differently. they were different people.

And over time, they did essentially the same thing, so the monkeys could learn who sold what for how much, who was trustworthy and who wasn't, and so on.

And it turns out that each experimenter actually has a small yellow plate of food.

And that's what monkeys can do with a single token.

So everything costs 1 token, but as you can see, some tokens buy more than others, and some buy more grapes than others.

So here's a quick video showing what this marketplace looks like in action.

Here's a monkey's eye view. The monkey is short, so it's a little short.

But here we have Honey.

She's been waiting for the market to open for a while.

Suddenly the market opens. Her choice is a grape or two.

We see Honey, a very good market economist, follow those who give more.

She can teach our financial advisor a few things.

So most monkeys, not just Honey, went with those who had more.

Most monkeys went with the man who had better food.

When we introduced sales, I saw monkeys take note of it.

They really cared about the monkey token dollar.

What was even more surprising was that when we worked with economists to use economic tools to actually look at monkey data, the data were essentially in line with what humans do in real markets, not only qualitatively but also quantitatively.

The number of monkeys is so large that it is difficult to distinguish whether they come from monkeys in the same market or from humans.

And what we really thought we had done was like actually introducing something that worked like a real financial currency, at least for monkeys and us.

The question is, do monkeys start to mess up like we do?

Well, we've already seen some indications that they might be, anecdotally.

One thing we've never seen in the monkey market, much like our own species, is evidence of savings.

The monkeys would enter the market, use up their budget, and then go back to the others.

Another thing we've seen spontaneously, embarrassingly, is spontaneous evidence of theft.

The monkeys used every opportunity to steal tokens. Monkeys, often from us. From what we didn't necessarily think we were introducing, but what we saw spontaneously.

So we said, this is bad.

Can we really check if monkeys are doing exactly the same stupid things as humans?

One possibility is to leave the monkey financial system alone and see if in a few years they start asking us for help.

We were a little impatient and wanted a little more speed.

So we said let's actually give the monkeys the same kinds of problems that humans are prone to get wrong with certain kinds of economic challenges and certain kinds of economic experiments.

So the best way to find out how people fail is to try it yourself, so I want to offer you a simple experiment to see how your own economic intuition works.

So, now imagine that I gave each of you $1,000, or ten $100 bills.

Pick these up, put them in your purse, and figure out what to do with them.

Because it's yours now. You can buy whatever you want.

Please donate or receive.

Sounds great, but it gives you one more option to make a little more money.

And here's your choice: You can also take the risk, in which case I'll flip one of these monkey tokens.

If you win, you get another $1,000.

If you land tails, you get nothing.

So it's a chance to get more, but it's also pretty dangerous.

Other options are a little safer. You are definitely going to get the money.

I'll give you only $500.

You can put it in your wallet and use it immediately.

See what your intuition is here.

In fact, most people choose to play it safe.

Most people would say why risk it when you can definitely get $1,500.

This seems like a good bet. So go.

You might say, uh, it's not unreasonable at all.

People are more or less risk averse. so what?

Now, "So what?" That happens when you start thinking about the same problem in a slightly different setting.

Now imagine I give all of you $2,000, or twenty $100 bills.

Now you can buy twice as much as you previously planned to buy.

Consider what happens if you keep it in your wallet.

Now imagine that you have made another choice. But this time things are a little worse.

Now, you get to decide how you lose your money, but you make the same choices.

It's okay to take risks and incur losses. Toss a coin there. If heads come out, you will actually lose a lot of money.

Even if you get tails, you don't lose anything. fine. can hold everything. Alternatively, you can play it safe. That means you have to put your hand in your wallet and hand me five $100 bills.

And there are a lot of people out there with furrowed brows.

So you probably have the same intuition as the actual test subjects in this experiment. In other words, people don't play it safe when presented with these options.

In fact, they tend to take a little risk.

The reason this is irrational is that it gives people in both situations the same options.

It's 50/50 whether it's $1,000 or $2,000 or definitely $1,500.

But people's intuition about how much risk to take depends on where they start.

what happened?

Well, it turns out that this seems to be the result of at least two prejudices we have on a psychological level.

One is that we find it very difficult to think in absolute terms.

To understand that one choice is 1,000, 2,000, you have to do some real work. One is 1,500.

Rather, it turns out to be very easy to think in very relative terms, as the options change from time to time.

So we think of things as 'oh I could get more' or 'oh I could get more'.

All of this is good, except that changes in different directions can actually affect whether you think an option is good or not.

And this leads to a second bias that economists call loss aversion.

It's a way of thinking that I really don't want to be in the red.

I would really hate to lose money.

This means that you may actually change your settings to avoid this.

What we found in the last scenario is that subjects take risks because they want small shots with no loss.

It means that when we are in risk thinking, excuse me, but in loss thinking, we actually become more risky and actually worry a lot.

This kind of thing affects humans in many bad ways.

This is why stock investors continue to suffer stock losses for so long. This is because stocks are valued relative to each other.

This is why people in the housing market have refused to sell their homes. Because I don't want to sell at a loss.

The question that interests us is whether monkeys exhibit the same biases.

If we set the same scenario in our little monkey market, would they do the same as humans?

Here's what we did. We gave the monkeys a choice between the safe ones, who do the same thing every time, and the dangerous ones, who do different things half the time.

And we gave them an option that was a bonus -- like you guys did in the first scenario -- that they actually have more chances, or are given chances to the parts that are experiencing losses -- that they actually thought they were getting more than they were actually getting.

And here's what it looks like.

We introduced monkeys to two new monkey salespeople.

The left and right ones both start with a single grape, so they look pretty good.

But they're going to give the monkeys a bonus.

The guy on the left is a safe bonus.

He always adds one and gives the monkey two.

The guy on the right is actually a dangerous bonus.

In some cases, monkeys do not receive bonuses. So this is a zero bonus.

Sometimes two monkeys are added.

As a big bonus, you can now get 3.

But this is the same choice you have just faced.

Do the monkeys really want to play it safe and follow a man who tries to do the same thing in every trial, or do they want to take risks and try to get a big but dangerous bonus but want to risk the possibility of not getting the bonus?

People here have played it safe.

Turns out, monkeys are playing it safe too.

When testing the same thing, people will choose exactly the same methods, both qualitatively and quantitatively.

"Maybe monkeys don't like risk," you might think.

Might need to see how they handle loss.

So I ran a second version of this.

Well, the monkeys met two men who gave no bonuses. They actually give less than they expect.

So they seem to be starting with a lot of money.

These are three grapes. Monkey is really excited about this.

But now they know they are going to give them less than they expect.

Those on the left are safe losers.

Each time he will take one of these and only give two to the monkey.

The man on the right is a dangerous loss.

Sometimes you don't lose and the monkeys get very excited, but sometimes you actually lose big and steal two and give only one to the monkey.

So what are monkeys doing?

Again, same choice. You can play it safe to make sure you get two grapes every time, or you can take a risky bet and choose between one and three.

The remarkable thing for us is that when we give monkeys this choice, they do the same irrational things that humans do.

It actually becomes more dangerous depending on how the experimenter started.

This is crazy because it suggests that monkeys also value things in relative terms and actually treat losses differently than they treat gains.

So what does this mean?

Well, what we've shown is that, first of all, you can actually give monkeys financial currency and they'll do very similar things with it.

They do smart things like we do, but they also do not-so-good things like stealing.

But they also do some irrational things that we do.

They get things wrong systematically in the same way that we do.

This is the first takeaway message for this talk. I mean, if you saw the beginning of this and thought, oh, I'm definitely going to go home and hire a capuchin financial advisor.

They're way cuter than the ones above...you know, don't do that. They will probably be just as stupid as the humans you already have.

Well, it's kind of bad -- I'm sorry, I'm sorry, I'm sorry.

It's a little worse for monkey investors.

But of course, the reason you laugh is also bad for humans.

Because we answered the first question.

We wanted to know where this kind of error came from.

And we started out with the hope that we might be able to tweak financial institutions or tweak technology to improve ourselves.

But what we've learned is that these prejudices can be deeper within us than that.

In fact, they may be due to the very nature of our evolutionary history.

Maybe the humans on the right side of this chain aren't the only ones who are mean.

Maybe you feel like you're going backwards.

And this means that these clever strategies could be 35 million years old, if the capuchin results are to be believed.

It takes a long time for strategies to change. Really, really old.

What do we know about other old strategies like this?

Well, one thing we do know is that they tend to be very difficult to overcome.

You know, think about our evolutionary preference for eating sweets and fatty foods like cheesecake.

You can't just block it.

You can't look at your dessert cart and say, "No, no, that's disgusting."

We just build differently.

We will recognize that it is good to pursue it.

My guess is that the same is true when humans perceive different financial decisions.

When you see your stock plummet into the red, when you see house prices falling, you can only look at it from an old evolutionary perspective.

This means that it is very difficult to overcome the biases that lead to poor performance and foreclosure crises for investors.

That's bad news. The question is, do you have any good news?

I am here to bring you good news.

Well, I think the good news is what I started at the beginning of the talk. It's just that humans aren't just smart, they're not smart. We are smart enough to be a real inspiration for other animals in the biological world.

We are good at overcoming biological limits. As you know, I came here by plane.

I didn't have to flap my wings.

I'm wearing contact lenses now so I can see everyone.

You don't have to rely on your own nearsightedness.

In fact, we have all these cases of seemingly very easily overcoming biological limits through technology and other means.

However, we need to be aware of their limitations.

And here is the problem.

He once said, "Humans are the only species that refuses to be what it is."

But the irony is that it may only be by recognizing our limitations that we can really and truly overcome them.

I hope that you will recognize your limitations, that they are not necessarily insurmountable, and that you will use the world of design to really understand them.

That may be the only way we can truly fulfill our own human potential and become the noble race that everyone desires.

thank you.

(applause)

When I was here last year, I was talking about swimming across the North Pole.

And although that swim was three years ago, I remember it like it was yesterday.

I remember standing on the edge of the ice and just now jumping into the water thinking to myself that I had never seen a more terrifying place on this planet.

The water is completely black.

The water temperature is minus 1.7 degrees Celsius, or 29 degrees Fahrenheit.

It freezes in that water.

Then a thought crossed my mind. If this swim turns things into pear-like situations, how long will it take my frozen body to sink four and a half kilometers to the ocean floor?

And I told myself I had to get this idea out of my head as soon as possible.

And the only way to dive into that freezing cold water and swim a kilometer is to cheer yourself up with your iPod, listen to everything from beautiful opera to Puff Daddy, then commit 100 percent to yourself – nothing is more powerful than a determined mind – and walk to the edge of the ice and just dive into the water.

The swim took 18 minutes and 50 seconds, but it felt like it took 18 days.

And when I got out of the water, I remember looking down at my fingers because my hand was so sore. My finger was literally the size of a sausage. Because our body is made up of water. When the water froze, it expanded, and the cells in the fingers froze, expanded, and burst.

And when I got out of that water, my most immediate thought was: I'm never going to swim in cold water again.

Anyway, last year I heard about the melting of the Himalayas and (laughs) the melting of glaciers due to climate change.

I have heard about this lake, Lake Imja.

This lake was formed in recent years by the melting of glaciers.

The glacier climbed all the way up the mountain and left this great lake in its place.

And I strongly believe that what we are seeing in the Himalayas is the next big, big battlefield on this planet.

Almost 2 billion people, or 1 in 3 people on the planet, depend on Himalayan water.

And with the population growing so fast, and climate change drastically reducing the supply of water from glaciers, I think we are at real risk of instability.

North, you have China. If you go south, you have India, Pakistan, Bangladesh, all these countries.

So I decided to walk up to Everest, the highest mountain on earth, and take an iconic swim under the summit of Everest.

Now, I don't know if any of you have the chance to go to Everest, but climbing it is quite the challenge.

Twenty-eight big and mighty yaks carry all the equipment up this mountain. I don't just have a Speedo, I have a large film crew and send all my images all over the world.

Altitude wasn't the only challenge in this swim.

I wanted to swim at an altitude of 5,300 meters.

So it's right there in heaven.

It's very, very difficult to breathe. You will get altitude sickness.

I feel like the guy standing behind me is constantly hitting my head with a hammer.

That's not the worst part.

Worst of all, this year was the year we decided to do a massive Everest cleanup.

So many people have died on Everest, and this was the year I decided to collect all the bodies of the climbers and descend.

And when you are climbing a mountain to do something that humanity has never done before, and indeed there are no fish – no fish swimming at 5,300 meters – and a dead body passing in front of you, it humiliates you and at the same time makes you realize very clearly that nature is far more powerful than we are.

And we walked all the way up this path.

And to our right was this amazing Khumbu Glacier.

And all the way along the glacier we could see large pools of melted ice.

Then we got to this little lake under the summit of Mount Everest. And I prepared for this swim, which was going to be very difficult, the same way I always prepared.

I put on my iPod, listened to music, tried to be as aggressive as possible, controlled my aggression, and then threw myself into that water.

I swam the first 100 meters as fast as I could, but soon I realized I had a big problem with my hands.

I could hardly breathe.

I was gasping for air.

Then I started choking and immediately vomited in the water.

And it all happened so quickly. Then I - I don't know how it happened - went underwater.

And luckily the water was pretty shallow so I was able to push myself off the bottom of the lake and stand up to catch my breath again.

Then I said, please continue. continue. continue.

After five or six more strokes, my body was empty and I sank to the bottom of the lake.

I don't know where I got it, but I managed to pull myself up and get to the lake side as quickly as possible.

I've heard it said that drowning is the most peaceful death.

I have never heard anything quite as bad as this.

(Laughter) It's the most frightening, panicking feeling you can have.

I reached the shore of the lake.

The crew picked me up and sprinted over the rubble to the camp.

And we sat there debriefing on what had happened on Everest.

And my team gave it to me straight.

They said, 'Lewis, if you want to do this swim, you need a radical change in tactics.

Don't forget everything you've learned in the last 23 years of swimming.

I put aside all the speed and aggression I learned while serving in the British Army.

I hope you can walk up the hill within two days.

Take a break and think about many things.

I want you to walk up the mountain in two days, but swim as slowly as possible instead of swimming fast.

Swim the breaststroke instead of the crawl.

And never swim aggressively.

Now is the time to swim with true humility.

And two days later we walked back to the mountains.

And I stood on the edge of the lake looking up at Mount Everest. She is one of the most beautiful mountains on earth. And I said to myself, Please take it slow.

And I swam across the lake.

And I can't put into words how good it felt to be on the other side.

But I learned two very important lessons on Everest. Thanks to the Sherpa team for teaching me this.

First, just because it worked in the past doesn't mean it will work in the future.

And likewise, now before I do anything, I ask myself what kind of mindset would be required to successfully complete a task.

And bringing it into the world of climate change – frankly, Mount Everest, which is the pinnacle of all problems – simply because we have lived the way we have, consumed the way we have for so long, populated the planet the way we have for so long does not mean that we are allowed to continue the way we have.

All the red flags are there.

When I was born, the world population was 3.5 billion.

The current population of 6.8 billion is expected to grow to 9 billion by 2050.

And the second lesson is a radical tactical change.

And I am here today to ask you guys. What kind of radical strategic shifts are possible in relation to the environment? Will that ensure that our children and grandchildren live in a safe, secure and most importantly sustainable world?

And I'm begging you, please, get out of here and think 100% of the time about radical tactical changes that make a big difference, and making them happen.

Blog, tweet, talk about it, and give it 100% effort. Because there is very little that we cannot achieve if we are serious about it.

Thank you very much.

I grew up on a small farm in Missouri.

We lived on less than $1 a day for about 15 years.

I went to college on a scholarship, studied international agriculture, studied anthropology, and decided to give back.

I was going to work with small farmers.

I intended to contribute to poverty alleviation.

I was going to work on international development, but I changed course and came here.

Now, even if you get a PhD and decide not to teach, you don't necessarily end up in a place like this.

it's a choice. You may end up driving a taxi.

you may be in new york

What I discovered was that I started working with all or almost all of the land-stripped and displaced refugees and victims of hunger – small farmers.

Now, what I've been trained to do is methodological research on such people.

So I ran it. I found out how many women were raped on their way to the camp.

I learned how many people were in prison and how many family members were killed.

I assessed how long they stay and how long it takes to feed them.

And I've become very good at predicting how many body bags we'll need for those dying in these camps.

Now, this is God's job, not mine.

It's not the kind of job I set out to do.

So I was at a Grateful Dead benefit concert in the rainforest in 1988.

I met a guy - the guy on the left.

His name was Ben.

He said, "What can we do to save the rainforest?"

I said, "So Ben, what are you doing?"

"I will make ice cream."

So I said, 'I have to make rainforest ice cream.

And to show that forests are more valuable as forests than pastures, we need to use nuts from the rainforest. ”

He said, "Okay."

Within a year, Rainforest Crunch was hitting stores.

It was a big success.

We bought on the 30th and sold on the 21st, making our first $1 million worth of trades.

This will release adrenaline.

We were creditworthy at that point, so we had a $4.5 million line of credit.

We had 15-20, maybe 22% of the global Brazil nut market.

We paid 2-3 times more than anyone else.

Everyone else raised their prices to Brazil nut collectors. Because otherwise we would buy it.

Great success.

50 companies registered, 200 products launched and generated 100 million sales.

I failed.

Why did it fail?

The people who were collecting Brazil nuts were not the same people who were cutting down forests.

And the people who made money on Brazil nuts weren't the people who made money on deforestation.

We were attacking the wrong driver.

We had to work on beef.

We had to do wood processing.

We had to work on soy, but we had to work on things we hadn't focused on before.

Now let's go back to Sudan.

I often talk to refugees, "Why haven't the West realized that hunger is caused by policies and politics, not the weather?"

And then one day this farmer said something very profound to me.

"You can't wake someone who pretends to be asleep," he said.

(Laughter) Okay. fast forward.

we live on a planet

Only one of them.

We have nothing more and we must wake up to the fact that this planet is finite.

We know the limits of the resources we have.

You may be able to use it in another way.

You may have innovative and new ideas.

But in general this is what we are getting.

Not anymore.

There is a fundamental equation we cannot escape.

Population and consumption should have something to do with the planet, but right now it's simply 'inequality'.

Our research shows that we live on about 1.3 planets.

Since 1990, we have crossed the line of being in a sustainable relationship with the planet.

It is now 1.3.

If we were farmers, we would be eating seeds.

For bankers, we live on principal, not interest.

This is where we stand today.

Many people like to point the problem elsewhere.

It's always population growth.

Population growth is important, but per capita consumption is also important.

So if the average American consumes 43 times as much as the average African, we must consider consumption to be a problem.

It's not just about the population, it's not just about them. it's about us.

But it's not just about people. It's about lifestyle.

There is very good evidence - again, we don't necessarily have a full peer-review methodology yet - but there is very good evidence that the average European cat has a larger environmental footprint over its lifetime than the average African cat.

Do you think it will continue to be a problem?

Don't you think it's a question of how we should use the earth's resources?

Let's go back and look at the equation.

In 2000 there were 6 billion people on the planet.

They were consuming what they were consuming. Let's say each consumption unit is 1 unit.

Our consumption is 6 billion units.

All scientists agree that by 2050 there will be nine billion people.

They will all consume twice as much as they do today – scientists agree – because incomes in the developing world will grow five times what they are today – about [2.9] times the global average.

In other words, consumption of 18 billion units will occur.

Who has heard recently that the production of goods and services must be tripled?

But that's what the math says.

You can't do that.

You can improve your productivity.

You can improve your efficiency.

But we must also consume less.

To produce more, you need to use less.

And then you have to use less again.

And we need to consume less.

All of them are part of the equation.

But it basically raises a fundamental question: Should consumers make choices about sustainability, sustainable products?

Should sustainable products be available for purchase next to non-sustainable products, or should every product on the shelf be sustainable?

If all that should be sustainable on a finite planet, how do we make it happen?

It takes the average consumer in the US 1.8 seconds.

Okay, let's be generous.

Let's say it's 3.5 seconds in Europe.

How do you evaluate all the scientific data about your product, data that changes weekly if not daily?

How do you get information?

you don't.

I have a small question here.

Is lamb meat produced in the UK from a greenhouse gas perspective?

Does it taste better than lamb that's grown in New Zealand and shipped frozen to the UK?

Are poor feeder lot operations for beef better or worse than poor grazing operations for beef?

Do organic potatoes actually use fewer toxic chemicals in their production than conventional potatoes?

In every case, the answer is "it depends".

It all depends on who made it and how.

There are many others.

How will consumers navigate this minefield?

it's not.

They may have a lot of opinions about it, but they're not going to get bad information.

Sustainability must come before competition.

It should be something we all care about.

And we need collusion.

We need groups working together that have never worked together before.

We need Cargill to work with Bunge.

Cooperating with Pepsi requires Coke.

You need Oxford to work with Cambridge.

You need Greenpeace to work with WWF.

China and the United States, everyone must work together

We need to start managing this planet as if our lives depended on it. Because it is fundamentally so.

But you can't do everything.

Even if everyone is working on it, you have to be strategic.

We need to focus on where, what and who does it.

So when it comes to where to work, we've identified 35 locations around the world where we need to work.

These are the places with the highest biodiversity and the most importance in terms of ecosystem function.

We have to work in these places.

We must save these places if we want a hell of a chance at preserving the biodiversity as we know it.

We examined threats to these locations.

These are the 15 commodities that pose the greatest underlying threats to these places through deforestation, soil loss, water use, pesticide use, overfishing, and more.

There are 35 locations and 15 priority products. Who will you work with to change the way these goods are produced?

Are we going to work with 6.9 billion consumers?

Well, that equates to about 7,000 languages, 350 of which are major. A lot of work is needed there.

I don't think anyone can actually do that very effectively.

Are you going to work with 1.5 billion producers?

It's a daunting task again.

There has to be a better way.

Between 300 and 500 companies control more than 70 percent of trading in each of the 15 commodities we identified as most important.

If we work with them and change those companies and the way they do business, the rest will happen automatically.

So we considered 15 products.

This is 9 of them.

I put them side by side and put the name of the company involved in each.

And if you look up the first 25 or 30 names of each item, you'll find, oh, there's Cargill here, there's Cargill there, there's Cargill everywhere.

In fact, these names will come up again and again.

So, we ran the analysis again in a slightly different way.

we said: If you take the top 100 companies, what percentage of all 15 products do they carry, buy, or sell?

And what we found is that it's 25%.

That means 100 companies control 25% of the trade in all 15 of the most important commodities on the planet.

We can help 100 companies.

You can partner with 100 companies.

Why is 25% important?

Because if these companies demand sustainable products, they will extract 40 to 50 percent of their production.

Companies can push producers faster than consumers.

By requiring this, businesses can leverage production much sooner than waiting for consumers to do so.

After 40 years, the global organic movement has achieved 0.7 out of 1 percent of the world's food.

I can't wait that long.

I don't have time for that.

We need accelerated change.

Working with individual companies probably won't get you there.

We need to start working with industry.

So we started a roundtable gathering the entire value chain, from producers to retailers and brands.

We invite civil society, NGOs, researchers and scientists to engage in informed discussions and sometimes battle royale to uncover what the main impacts of these products are, what the global benchmarks are, what the acceptable impacts are, and the design criteria around it.

It's not all fun and games.

In salmon farming, we started a roundtable almost six years ago.

Eight entities have arrived at the table.

I think we ended up getting 60 percent of the world's production at the table and 25 percent of the demand at the table.

Three of the original eight parties sued each other.

Yet next week we will be announcing globally validated, vetted and accredited standards for salmon farming.

Possible.

(Applause.) So what brings different groups to the table?

It's risk and demand.

For large companies, it's a reputational risk, but more importantly, they don't care what the product costs.

A business cannot exist without a product.

They value availability, so a complete lack of a product is a big risk.

For producers, if a buyer wants to buy something produced in a certain way, that brings them to the bargaining table.

In other words, demand is what makes them the subject of discussion.

The good news is that we identified 100 companies two years ago.

In the last 18 months, we have signed agreements with 40 of these 100 companies to initiate supply chain cooperation.

And within the next 18 months, we plan to sign up 40 more people to work with, and we believe we can sign them up as well.

What we're doing now is getting these 80 CEOs together and helping the final 20 get their hands dirty and bring them to the negotiating table. Because they hate NGOs, have never worked with NGOs, and worry about this and that. But because we all need to work together on this issue.

So we are doing everything we can.

We are using every means to bring them to the bargaining table.

Cargill is one of the companies we work with that is starting its sustainability journey, albeit in its infancy.

They funded research showing that global palm oil production could double over the next 20 years without cutting down a single tree, and that Borneo alone could do it all by planting trees on already degraded land.

The study shows that the highest net present value of palm oil is on degraded land.

We are also investigating all palm oil sourcing to see if it can be certified and what changes need to be made to achieve third party certification under a reputable certification program.

Why is Cargill important?

Because Cargill owns 20-25% of the world's palm oil.

A decision by Cargill would move at least 40 to 50 percent of the entire palm oil industry.

it doesn't matter.

More importantly, Cargill and another ship 50 percent of the palm oil destined for China.

If Cargill only sent sustainable palm oil to China, no one Chinese company would have to change its ways.

It's a pre-competition issue.

All the palm oil that is sent there is good.

buy it.

Mars continues a similar journey.

Most people now understand that Mars is a chocolate company, but Mars has made a sustainability pledge to only buy certified products for all seafood.

For pet food, it turns out Mars buys more seafood than Walmart.

But they do some very interesting things with chocolate, and it all comes from the fact that Mars wants to do business in the future.

And they believe that chocolate production needs to be improved.

On any given plantation, 20 percent of the trees produce 80 percent of the crop, so Mars is looking at the genome, sequencing the genome of the cocoa plant.

They are working with IBM and the Department of Agriculture to bring this data into the public domain because they want everyone to have access to this data and they want everyone to work together to make cocoa more productive and sustainable.

They found that if they could identify productivity and drought tolerance traits, 40 percent of the land could produce 320 percent of the amount of cocoa.

The rest of the land can be used for other things.

Less and less and less.

That's the future and it's wise to put it in the public domain.

They don't want to be IP owners. Company; they want to be a chocolate company, but they want to be a chocolate company forever.

Now, this is strange because a lot of people complain about food prices, but in reality food prices are going down and consumers aren't actually paying the true cost of food.

Looking just at water, for four very common products, how much did farmers produce to make them, then how much water was put into those products, and how much money was paid to the farmers.

Dividing the amount of water by the amount paid to the farmers means that the farmers do not receive enough money to pay a decent price for water for these commodities.

It is by definition an externality.

This is a subsidy from nature.

Coca-Cola has done a lot with water and now has a 17-year contract with a Turkish producer to sell juice to Europe. They are doing it because they want to make products that are closer to the European market.

But they're not just buying juice. They also buy the carbon in the trees to offset the carbon-related shipping costs of getting their products to Europe.

Carbon is purchased along with sugar, coffee and beef.

This is called a bundle. Those externalities come back to the price of the product.

We need to take what we've learned in private voluntary standards about what the world's best producers are doing and inform government regulation to change the entire performance curve.

We can't just focus on identifying the best. I have to move the rest.

The question is not what to think, but how to think.

These companies are starting to think differently.

they are on a journey. There is no turning back.

We are all on the same journey as them.

We have to really start changing the way we think about everything.

What was sustainable on a planet of 6 billion people is not sustainable on a planet of 9 billion people.

thank you.

(applause)

I will tell you about some of the things in this book of mine, in the hope that they will resonate with others you have already heard. And I'll try some relevance myself too, in case you missed it.

But I want to start with what I call the "official dogma".

What is the official dogma?

Official doctrine of all Western industrial societies.

And the official doctrine goes like this: If we are interested in maximizing the welfare of our citizens, the way to do that is by maximizing individual liberties.

The reason is that freedom is in itself good for human beings, worthy, worthy and essential to being human, and that if people had freedom, each of us would be able to act for ourselves to maximize our welfare and no one would have to decide for us.

The way to maximize your freedom is to maximize your choices.

The more choices people have, the more freedom they have and the more well-being they have.

This is so deeply ingrained in waterworks that I don't think anyone would question it.

And it is deeply rooted in our lives.

Here are some examples of what modern advancements have enabled us to do.

This is my supermarket.

I just want to say a few words about salad dressing.

My supermarket has 175 different salad dressings. However, aside from the 10 types of extra virgin olive oil and 12 types of balsamic vinegar you can buy to make so many salad dressings, chances are none of the 175 salad dressings on offer are for you.

So the supermarket looks like this.

Then I go to an electronics store to set up my stereo system (speakers, CD player, tape player, tuner, amplifier). This one electronics store has this many stereo systems.

Build 6.5 million different stereo systems from components available in one store.

I have to admit that it has a lot of options.

Another realm is the world of communication.

When I was a boy, there was a time when you could get any phone service from Ma Bell.

I didn't buy a mobile phone, I rented it.

By the way, one of the results is that the phone didn't break.

And those days are over.

Nowadays, especially in the world of mobile phones, there are almost unlimited types of phones.

These are the mobile phones of the future.

My favorite is the one in the middle. An MP3 player, a nose trimmer and a creme brulee torch.

And if -- (laughter) you haven't seen it in stores yet, don't worry, you will soon.

And what this does is people come into the store and ask this question.

And do you know what the answer to this question will be?

The answer is no. "

It's impossible to buy a cell phone that doesn't work very well.

So a similar explosion of choices applies to other aspects of life that are far more important than buying things.

health management.

In the United States, we no longer go to the doctor and he tells us what to do.

Instead, you go to the doctor and the doctor says, "Well, you can do A, you can do B.

A has these benefits and risks.

B has these benefits and risks.

And you say, "Doctor, what should I do?"

And the document says, "A has the following benefits and risks, and B has the following benefits and risks.

what do you want? "

And you say, "If you were me, what would you do, sir?"

Then the doctor says, "But I'm not you."

As a result, we call it “patient autonomy,” and while that sounds good, it’s really about shifting the burden and responsibility of decision-making from someone who knows something – the doctor – to someone who knows nothing, is almost certainly ill and is not in optimal condition to make a decision – the patient.

A lot of prescription drugs are being sold to people like you and me, but when you think about it, it doesn't make sense because we can't buy prescription drugs.

Why would they pitch to us if we can't buy?

The answer is that the next morning we expect the doctor to call us to change the prescription.

As this slide shows, something as dramatic as our identity is now a matter of choice.

We don't inherit identities. we end up inventing it.

And we can reinvent ourselves as much as we like.

That means that every day, when you wake up in the morning, you have to decide who you want to be.

When it comes to marriage and family, there was a time when the default assumption of nearly everyone was to get married as soon as possible and start having children as soon as possible.

The only real choice was who to choose, not when and then what.

Everything is now available.

I teach wonderfully intelligent students, but I am assigned 20% less work than I used to.

It's not because they're less smart or less diligent.

It's because my head is full of "Should I get married or not? Should I get married now?"

Should we get married later?

These are all consumer questions.

And they're going to answer these questions, whether it means I'm not doing all the work I've been assigned, or that I'm not doing well in my courses.

And indeed, it should.

work.

As Karl pointed out, we are blessed with technology that allows us to work every minute of every day from anywhere on the planet except the Randolph Hotel.

(Laughter) (Applause) Now, I'm not going to tell anyone, but there's one place where WiFi actually works.

I want to use it, so I won't tell you about it.

What this means is that the incredible freedom of choice we have with regard to work forces us to make decisions over and over again about whether we should work or not.

We can go to our kids' soccer, with a cell phone on one hip, a Blackberry on the other, and maybe a laptop on our lap.

And even with all the power off, every time we watch a kid riot at a soccer game, we're also asking ourselves, "Should I be on this cell phone?"

Should I reply to this email? Should I draft this letter? ”

Even if the answer is no, your child's soccer experience will be very different.

So wherever we look, big or small, material or lifestyle, life is a matter of choice.

And the world we once lived in was like this.

[Well, it's actually written in stone. ] So there were some options, but not all of them were a matter of choice.

The world we live in now looks like this.

[Ten Commandments Do-It-Yourself Kit] And the question is, is this good news or bad news?

And the answer is yes.

(Laughter) We all know what's good, so I'll talk about what's bad about it.

All this choice has two effects on people, two negative effects.

Paradoxically, one of its effects is to cause paralysis rather than liberation.

Too many choices make it very difficult for a person to choose.

Here is one very dramatic example of this. It was a study done on investing in voluntary retirement plans.

A colleague of mine accessed the investment records of about 1 million employees and about 2,000 different workplaces from Vanguard, a giant mutual fund company.

She found that participation dropped by 2% for every 10 mutual funds offered by employers.

If you give 50 funds, 10% fewer employees will participate than if you give only 5.

Because with 50 funds to choose from, it's very hard to decide which fund to choose, put off until tomorrow, tomorrow, and tomorrow, and tomorrow, of course tomorrow never comes.

Realize that not only does this mean that you will have to eat dog food in retirement because you don't have enough money, but it will also mean that you will miss out on large matching payments from your employer because the decision is so difficult to make.

By not participating, they are wasting as much as $5,000 a year from their employers. Employers should be happy to match their contributions.

In other words, paralysis is the result of having too many choices.

And I think that's what makes the world look like this.

[And finally, forever, French food, blue cheese, or ranch?] (Laughter) If it goes on forever, you really want to make the right decision, right?

I don't want to pick the wrong mutual fund or the wrong salad dressing.

That's one effect.

A second effect is that even if you manage to overcome your paralysis and make a choice, you will be less satisfied with the outcome of your choice than if you had fewer options to choose from.

There are several reasons for this.

One is what is salad dressing when there are so many salad dressings out there and none of them are perfect. --I can easily imagine a different choice would have been better.

And what happens is that this imaginary alternative makes you regret your decision, even if it was a good one, and this regret reduces the satisfaction you get from your decision.

The more options you have, the easier it is to regret that you were even slightly disappointed in the options you chose.

The second is what economists call “opportunity cost”.

Dan Gilbert made an important point this morning about how how we value things depends on what we compare them to.

Well, when there are so many options to consider, it's easy to imagine that the appealing characteristics of rejected options reduce satisfaction with the chosen option.

Here is an example.

[I can't help but think of the other parking spaces on W 85th Street] Sorry if you're not a New Yorker.

Here are some things you should consider:

This is a couple living in the Hamptons. very expensive real estate.

great beach. good day. they have everything to themselves.

What could be better?

"Damn," the man thinks, "it's already August. All the Manhattan neighbors are out.

You may be able to park in front of my building. ”

And he spent two weeks haunted by the idea that he was missing out on a great parking space every day.

(Laughter) Even if our choices are great, there is an opportunity cost to take away from the satisfaction we get from our choices.

And the more options there are to consider, the more attractive features of those options will be reflected as an opportunity cost.

Here's another example.

(Laughter) Well, this comic makes a lot of points.

It also points to living in the present moment and perhaps taking things slowly.

But the point here is that whenever you choose something, you're choosing not to do other things, and while those other things may have a lot of appealing features, they make what you're doing less appealing.

I noticed this when I went to buy new jeans.

I wear jeans almost all the time.

There was a time when there was only one taste of jeans and you bought them and they fit like shit.

It was incredibly uncomfortable, but once I wore it long enough and washed it many times, it started to feel okay.

I've been wearing old jeans for years, so I went to buy new jeans.

I said, "I want jeans. These are my size."

The shopkeeper then said, "Would you like a slim fit, an easy fit, or a relaxed fit?"

Would you like a button fly or a zipper fly? Do you want a stone wash or an acid wash?

do you want them to suffer?

Boot cut or tapered? ' he said repeatedly.

My jaw dropped.

And after I recovered, I said, "I want the kind that used to be the only kind."

(Laughter) He had no idea what it was.

(Laughter) So I spent an hour trying on all of these jeans and walked out wearing the best fitting jeans I've ever had, in fact.

I did better.

But—I felt worse.

why? I wrote a book to explain this to myself.

The reason is -- (Laughter) I feel sick because my expectations of how good jeans should be with all this choice.

There was only one flavor, so I wasn't expecting much.

When there were 100 flavors, any one would have been perfect.

And what I got was good but not perfect.

So I compared what I got with what I expected, and what I got compared to what I expected was disappointing.

Adding options to people's lives inevitably raises people's expectations of how good those options will be.

And the result is less satisfaction with the results, even if they are good.

[Everything looks so great. I can't wait to be disappointed. ] No one in the marketing world knows this.

The truth is more like this.

[All was good when all was bad. ] The reason all was good when all was bad is that when all is bad, people can actually have pleasant surprise experiences.

Today, the world we live in, we wealthy, industrialized nations, expect perfection, but the best we can expect is that things will be as good as they are supposed to be.

Your expectations, my expectations, are through the ceiling, so you'll never be pleasantly surprised.

The secret to happiness -- this is what you've been looking for -- The secret to happiness is to keep your expectations low.

(Laughter) [Please do] (Applause) (Laughter) I want to say something a little autobiographical, but I actually have a wife, and she's a wonderful person.

Couldn't have done better.

But settling down isn't necessarily a bad thing.

Finally, when there is only one type of jeans available, buying the wrong size jeans results in dissatisfaction, and when asked why and who is to blame, the answer is clear. The world is responsible.

With hundreds of different styles of jeans, it's equally clear that when you ask what is the reason and who is to blame when a pair of jeans you buy doesn't meet your expectations, the answer to that question is YOU.

could have done better.

With 100 types of jeans on display, you can't go wrong.

Therefore, when people make a decision, they are disappointed with the decision even if the outcome of the decision is positive. they blame themselves.

Clinical depression has exploded in industry in the last generation.

I believe that a significant, if not the only, factor in this explosion of depression and suicide is that people set their standards so high that they experience disappointing experiences and feel bad when they have to explain those experiences to themselves.

So the end result is that we overall, objectively, perform better, but feel worse.

So, I remind you, this is the official dogma, what we all believe to be true, and it's all wrong.

There is no question that some choice is better than no choice.

But that doesn't mean that more options are better than some.

There are magical amounts. I don't know what it is.

I believe we are well past the point where options improve our well-being.

Now, as a policy issue, we are nearing the end, but as a policy issue, it is material affluence that makes all these choices possible in an industrial society.

There are many places in the world and we have heard about some of them, but the problem is not too many choices.

Their problem is that they have too little.

So what I'm talking about is a problem unique to modern affluent Western societies.

And what's so frustrating and infuriating is this. Yesterday, Steve Levitt talked about how those expensive, hard-to-install car seats are useless.

My point is that these expensive and complicated choices are not just useless.

They were actually hurt.

They actually make our lives even worse.

If some of the things that enable people in our society to make all the choices we make were transferred to a society where people had too few choices, not only would those people's lives be better, but so would our lives.

Economists call this the "Pareto improvement movement."

Because this over-choice plagues us, income redistribution makes life better for all, not just the poor.

As conclusion.

[You can be whatever you want - there are no limits. ] You read this comic and as a sophisticated person you should say, "Oh! What does this fish know? Nothing is possible in this fishbowl."

Lack of imagination, short-sighted view of the world - that's what I thought when I read it at first.

But the more I thought about it, the more I came to the idea that this fish knew something.

The truth of the matter is that once you break the fishbowl so that everything is possible, there is no freedom.

Smashing this fishbowl to make everything possible is less than satisfying.

Paralysis increases and gratification decreases.

Everyone needs a fishbowl.

This is almost certainly too restrictive. Perhaps for the fish, and of course for us.

But I think the absence of the metaphorical fishbowl would be a recipe for misery, and perhaps disaster.

thank you very much.

(applause)

The global challenges I want to talk about today are rarely on the front page.

But it is huge in both scale and importance.

See, you guys travel a lot. After all, this is TEDGlobal.

But I want to take you to places you've never been before.

So let's start with China.

This photo was taken two weeks ago.

In fact, one indication is that the little boy on her husband's shoulders has just graduated from high school.

(laughs) But this is Tiananmen Square.

Many of you must have been there before. It's not real China.

I will guide you to the real China.

It is located in the Dabian Mountains in the remote province of Hubei in central China.

Omanju is 13 years old at the beginning of the story.

She lives with her parents, two brothers and a great aunt.

Their huts have no electricity, running water, watches, or bicycles.

And they share this wonderful splendor with a very large pig.

When Dai Manju was in sixth grade, his parents said, ``The $13 tuition is too expensive, so I'm going to drop him out.''

You will spend the rest of your life in the rice fields.

Why waste this money on you? ”

This is what happens to girls in remote areas.

It turns out that Daimanju was the best student in the grade.

She still walked the two-hour drive to the schoolhouse, trying to catch any information leaking out the door.

We wrote about her in the New York Times.

New York Times readers are generous with small amounts, so most of them were checks for $13 (laughs), but then I received a wire transfer of $10,000. Really nice person.

We gave the money to that guy there, the principal of the school.

he was overjoyed.

He thought, "Oh, maybe we can renovate the school."

I can give scholarships to all girls if they work hard and stay in school.

So, Daimanju basically graduated from middle school.

She attended high school.

She went to accounting school.

She looked for work in the southern province of Guangdong.

She found a job and looked for jobs for her classmates and friends.

She sent the money back to her family.

They built a new house, but this time it had running water, electricity, bikes and no pigs.

What we saw was an experiment of nature.

External investment in girls' education is rare.

And over the years, in tracking Dai Manju, I've found that she's been able to move from vicious to virtuous.

Not only did she change her power, she changed her home, her family, her village.

The village has become a real standout.

Of course, most of China was prosperous at the time, but roads could be built to connect it to the rest of China.

And that led me to the first major theme of Half the Sky's two doctrines.

Gender inequality is the central moral issue of this century.

In the 19th century there was slavery.

The 20th century was totalitarian.

The cause of our time is the atrocities faced by so many people around the world because of their gender.

So some of you might be thinking, "Oh my God, that's an exaggeration."

she's exaggerating ”

Now let me ask you this question.

How many people in the world do you think are more male or female?

Please let me take a survey. How many people in the world think there are more men?

Please raise your hand.

How many people think there are more women in the world? How many?

Well, most of you.

Well, you know about the latter group, but you're wrong.

Indeed, in Europe and the West, there will be times when women and men will have equal access to food and health care, and women will be more numerous and live longer.

But in most other countries of the world this is not the case.

In fact, demographers indicate that between 60 million and 100 million women are missing in the current population.

And as you know, it happens for several reasons.

For example, more girls have died from discrimination in the last half century than all the people killed on all battlefields in the 20th century.

An ultrasound may also be the cause.

Lack of resources causes girls to be aborted before they are born.

For example, this girl is in a nutrition center in Ethiopia.

The whole center was filled with girls like her.

Remarkably, the brothers from the same family were in perfect health.

In India, during the first year of life, from birth to age 1, boys and girls basically survive in equal proportions. Because they are dependent on the breast, and they do not see the son's preference in the breast.

Across India, girls aged 1 to 5 have a 50 percent higher mortality rate than boys.

The second tenet of “Half the Sky” is that morality of right and wrong can be put aside and on a purely practical level, one of the best ways to fight poverty and fight terrorism is to educate girls and get them into the formal workforce.

Poverty, for example.

There are three reasons.

First, overpopulation is one of the persistent causes of poverty.

And as you know, educating boys tends to result in slightly fewer children in the family.

Educating a girl tends to make her produce significantly fewer children.

The second reason has to do with spending.

It's like the dirty little secret of poverty. So not only do poor people earn very little, they spend their income less wisely, and unfortunately most of that spending is done by men.

The study found that when looking at people living on less than $2 a day, one of the indicators of poverty, 2 percent of their take home income goes to this basket: education.

Twenty percent goes to a basket of alcohol, tobacco, sugary drinks and a mix of prostitution and festivals.

Putting just 4 percentage points into this basket has a transformative effect.

The final reason has to do with women being part of the solution, not the problem.

Must use scarce resources.

It's a waste of resources if you don't use people like Daimanju.

Bill Gates said while traveling in Saudi Arabia:

He was speaking to an audience like you.

But two-thirds of the way there were barriers.

This side was the man, next was the barrier, and this side was the woman.

Then someone stood up from this side of the room and said, "Mr. Gates, we are aiming to be one of the top 10 countries in technology here in Saudi Arabia.

do you think it will work? ”

So Bill Gates stared at the audience and said, "It's impossible to get anywhere near the top 10 unless you make the most of half of your country's resources."

Now, here are the Arabic banknotes.

(Laughter) So what would the specific challenges be?

I think the number one topic on the agenda is sex trafficking.

And let me just say two things about this.

At the height of the slave trade in the 1780s, about 80,000 slaves were shipped from Africa to the New World.

Well, modern day slavery. About 800,000 people, ten times that number, are trafficked across borders, according to rough State Department figures.

And that doesn't even include what is traded within our borders, which is a significant part.

And if you look at another factor, another contrast, slaves back then were worth about $40,000 in today's money.

Now you can buy a trafficked girl for hundreds of dollars, which means she's actually more disposable.

But as you know, progress is being made in places like Cambodia and Thailand.

Don't expect a world where girls are bought, sold, and killed.

Second on the agenda is maternal mortality.

As you know, giving birth in this area is a wonderful event.

In Niger, one in seven women is expected to die in childbirth.

Worldwide, one woman dies in childbirth every minute and a half.

It's not that we don't have a technical solution, but these women have three shortcomings: poor, rural, and female.

As you know, for every woman who dies, there are 20 women who survive but are injured.

And the most serious injury is an obstetric fistula.

This is a laceration during closed labor that causes a woman to become incontinent.

Let's talk about mahabba.

She lives in Ethiopia.

She married against her will at the age of thirteen.

She got pregnant and ran into the bush to have the baby, but you know, her body was so immature that it ended up in closed labor.

The baby died and had a fistula.

This means that she is incontinent. She couldn't control her excrement.

In a word, she stinks.

The villagers thought she was cursed. They didn't know what to do with her.

So finally they put her in a hut on the outskirts of the village.

They ripped off the door so that hyenas would attack her at night.

There was a stick in the hut that night.

She repelled a hyena with the stick.

And the next morning she was sure that if she could go to a nearby village with foreign missionaries, she would be saved.

She had suffered some kind of nerve damage and had crawled 30 miles to the doorway, half dead.

A foreign missionary opened the door, realized exactly what had happened, and took her to a fistula hospital near Addis Ababa, where she was repaired in a $350 surgery.

The doctors and nurses there realized that she was not only a survivor, but also very smart, so they made her a nurse.

So now, Mahabba, she is saving the lives of hundreds and thousands of women.

She became part of the solution, not the problem.

She got out of a vicious cycle and moved into a virtuous cycle.

Now that we've talked about some challenges, let's talk about some solutions. There are predictable solutions.

I hinted at them about education and economic opportunities.

So, of course, if you educate a girl, she tends to get married later in life and have children later in life, she tends to have fewer children, and if she has children, she educates in a more enlightening way.

Where there is economic opportunity, we can make a difference.

I'm talking about Saima.

She lives in a small village outside Lahore, Pakistan.

And at that time she was miserable.

She was beaten daily by her unemployed husband.

He was kind of a gambler type, so he didn't get the job and took his frustrations out on her.

Now, when the second daughter was born, the mother-in-law said to her son, "I think you should get a second wife.

Saima has no intention of having a son with you. ”

when her second daughter was born.

At the time, there was a small loan group in the village that lent her $65.

Saima took the money and started an embroidery business.

Merchants liked her embroidery. It sold so well that they kept asking for more.

And when they couldn't produce enough, they hired other women in the village.

Soon there were 30 women working in the village for her embroidery business.

And when I had to carry all my embroidery products from the village to the market, I needed someone to help me with the transportation, so I hired my husband.

So now they are together.

He will be responsible for transportation and distribution, and she will be responsible for production and procurement.

And now they have a third daughter and all of them have their education tutored because Saima knows what's really important.

Here we come to the last element, education.

Larry Summers, when he was chief economist at the World Bank, once said, "Education for girls may be the highest return on investment in developing countries."

Let's talk about Beatrice Vila.

Beatriz lived in Uganda near the Congo border but, like Dai Manju, never attended school.

In fact, she had never been to school and had never been to school for a day.

Her parents also said, 'Why should we spend money on her?

She will spend most of her life hauling and hauling water. ”

Well, it just so happens that at the time there was a group in Connecticut called the Niantic Community Church Group in Connecticut.

They made a donation to an Arkansas-based organization called Heifer International.

Heifers sent two goats to Africa.

One of them went to Beatrice's parents and twins were born to the goat.

The twins started to give milk.

They sold milk for cash.

Cash started to pile up, and soon my parents said, "I have enough money. Let's send Beatrice to school."

So Beatrice is 9 years old and has never been to school, but she started in grade 1 with a 6 year old.

Regardless, she was really happy to go to school.

She rose to the top of her class.

She topped her class throughout elementary and middle school, excelled on the national exams in high school, and became the first-ever scholarship recipient in her village to go to the United States.

Two years ago she graduated from the University of Connecticut.

On her graduation day, she said, "I'm the luckiest girl alive because of the goat."

(Laughter) That goat was $120.

See how a little help can make a big difference.

But I want you to check the reality.

please look. US aid, helping people is not easy. Some books criticize US aid.

I have a book by Bill Easterly.

There is a book called "Dead Aid".

As you know, the criticism is fair. It's not easy.

You know, people say half the well projects failed after a year.

When I was in Zimbabwe, I was going around a place with the village chief, and he wanted to raise money to build a secondary school, and there was construction going on a few yards away, and I said, "What's that?"

He muttered something.

It turned out to be a failed irrigation project.

A few meters away was a broken chicken coop.

One year all the chickens died and no one wanted to put them in there.

That's true, but we don't think you should wash your baby down with bath water. actually improve.

Learn from your mistakes and continuously improve.

We also believe that individuals can and should make a difference. Because when individuals work together, they can contribute to the creation of movement.

And it is the movement of men and women that is needed to bring about social change, change that addresses this great moral challenge.

So I ask, what is it good for you?

You are probably asking that. Why should you care?

I'll leave you with just two things.

First, research shows that once you have all your material needs met—which most of us in this room do—there is very little in life that can actually make you happier.

One of them is contributing to a cause greater than yourself.

And second, this is an anecdote.

It's the story of an aid worker in Darfur.

There was a woman who worked in Darfur and saw things no human should see.

Throughout her time there, she was strong and resolute.

she never broke.

Then she returned to America and was on Christmas break.

She was in her grandmother's backyard and witnessed an event that brought her to tears.

It was a bird feeder.

And she realized she had the great fortune of being born in a country where we take security for granted, where we can not only eat, clothe and live in ourselves, but feed wild birds so we don't starve in the winter.

And she realized that with great luck comes great responsibility.

And just like her, you and I, we all won the lottery of life.

The question, then, is how to fulfill that responsibility.

So this is the reason.

Get involved in exercise.

Be happier and save the world.

thank you very much.

(applause)

When I saw a piece of technology called Kinect (it was called Natal), I was inspired. And for a moment I thought it might be possible to address one problem of storytelling. It's about creating characters that seem alive, can notice me, look in my eyes and feel real, and can sculpt a story about our relationship.

So a year ago I showed this at a computer show called E3.

And this was part of the technology that someone called Claire interacted with this boy.

And, on the Internet, there was a big fuss saying, "Hey, this can't be real."

So I waited until now to do a real demo of the technology in action.

Well, this technology incorporates three big elements.

The first is the Kinect camera coming out in November, the incredible AI that was covered and dusted in a dusty vault at Microsoft, and a very crude attempt at AI at a company called Lionhead, all mixed together to create a real life creature inside a computer just to arrive at this one simple idea.

To be honest, most of them are just tricks, but tricks that actually work.

Now let's take a look at the demo.

I'm Dimitri.

Dimitri, swing your arms around.

Well, you found him sitting.

No controller, keyboard, mouse, joystick or joypad.

He just uses his hands, body, and voice in the same way that humans use their hands, body, and voice.

Now let's move on.

You will meet Milo for the first time.

To be honest, when we first created Milo, we found that he looked like a bit of a brat, so we had to give him a problem.

He was quite the intellectual and wanted to make you laugh.

So the problem we presented him with was: he just moved

He moved from London to New England, USA.

His parents are too busy to listen to his troubles and from then on he will almost think of you.

So he's walking in the grass.

And you can interact with his world.

What's great is that what we're doing is constantly changing Milo's mind.

In other words, it is impossible for two Milos to be the same.

Here we are actually sculpting a human being.

So he's discovering the garden.

You can help him discover the garden just by pointing out these snails.

It's very simple at first.

By the way, boys are snails, boys are snails. If you're a girl, it's a butterfly. Because, we discovered, girls hate snails.

(Laughter.) Remember, this is your first time meeting him, and we want to really engage you and make you more curious.

By the way, his face is completely made by AI.

We have full control over the diameter of his nostrils to indicate his blush reaction or stress.

Actually, I'm doing something called body matching.

If you are slouching, he will try to slightly change the neurolinguistics of your face. Because we were working with this strong idea. "How can I convince you that something is real?"

I used my hands on this.

Another use is your own body.

Instead of pushing left and right with your mouse or joypad, why not just lean back in your chair and use your body?

You can also lean back, but the camera perspective changes depending on which way you're looking.

So Dimitri is going to use his hands now—he used his hands. he used his body

He's now going to use one more essential thing: his voice.

Now for speech, our experience with speech recognition is pretty bad, isn't it?

It never works.

order a flight ticket Finally we reach Timbuktu.

So we tackled the problem and came up with a solution. More on that later.

Milo: You can crush it.

Peter Molyneux: What are you going to do, Dimitri?

Female Voice: Squashing a snail may not seem important, but remember that even this choice affects Milo's growth.

Do you want Milo to crush you?

When you see the mic, say "... (PM: Squash.) ... OK, let me decide."

Dimitri: Come on, Milo. please crush it

PM: No, that's wrong.

Let's see how he reacts.

He said, "Come on, Milo. Crush it."

That's where we use a technology called Tellme.

The company was acquired by Microsoft a few years ago.

We have a database of words we recognize.

We pick those words out.

It also references it with Dimitri's voice and a tone database built from user voices.

Now we have to get a little more involved, but again, what we can do is observe the body.

It will run immediately.

Milo: How deep is it?

deep.

PM: Okay. So what we're going to do is teach Milo to skim stones.

We actually teach him.

What's really interesting is that men tend to be more competitive here than women.

They have no problem teaching Milo for the first few throws, but after that they want to beat Milo and women are more nurturing about this.

Well, this is stone skimming.

How do you pick up stones?

You stand up and graze the stones.

It's that simple.

It's just a matter of recognizing your body, recognizing your body movements and techniques, and understanding that you've gone from sitting to standing.

Again, all of this is done the way we humans do things, and this is very important if you want Milo to look authentic.

Female Voice: See if you can inspire him to do better.

Try bumping your boat.

Milo: Oh, yeah. It's very close.

PM: That's Dimitri's most competitive player.

I beat a child who is now 11 years old. wonderful.

Milo: I see.

PM: So Milo is being called back by his parents to give us some time alone to help him out.

Basically, the part we missed the first time, his parents were asking him to clean up his room.

And we will help him from now on.

But this is an introduction and this is all about the depth psychology we are going to use.

I'm trying to show you what I think is the best part. You can speak to Milo in a natural voice.

Well, doing that required a setup that looked like a magician's trick.

And what we did was we needed to give Milo this big problem.

As Dimitri starts cleaning up, he hears Milo talking to his parents.

Milo's Mom: Oh, there's gravy on the floor. (Milo: I didn't mean it!) Milo's Mom: That carpet is new.

PM: So he spilled the sausage plate on the floor, on the brand new carpet.

We've all done it as parents. We all have done it in our childhood.

For Dimitri, it's a chance to reassure and calm Milo.

Everything was too heavy for him.

he just moved he has no friends

Now is the time to open that portal and allow Milo to speak to you.

Female Voice: How about saying some words of encouragement to cheer Milo up?

Dimitri: Come on, Milo. You know who your parents are.

They are stressed all the time.

Milo: What did they want to do here in the first place?

we don't know anyone

Dimitri: Well, I have to go to a new school.

You will meet many cool new friends.

Milo: I really miss my old house, that's all.

Dimitri: Well, this is a very nice house, Milo.

There is a cool garden and pond.

Milo: It was nice scooping stones.

This sounds good.

you cleaned my room

thank you.

PM: Three fifteen minutes later, he recognized you.

And if you're sitting in front of this screen, I promise it's a really great moment.

And we are now ready to tell a story about his childhood and his life and it goes on and you know he has a lot of adventures.

Some of those adventures are a little darker or on the darker side.

Some of those adventures are very inspiring. he has to go to school

The cool thing is that we do the same. As you interact with him, you can put things into his world. He recognizes objects.

His heart is above the clouds.

That means Milo's mind just keeps getting smarter as millions of people use it.

He will be able to recognize more objects and understand more words.

But for me, this is a great opportunity to finally connect with technology, and not be bound by a finger on hand or the blandness of not being noticed watching a movie or book as far as computer games are concerned.

And I love those revolutions, and I love the future that Milo brings.

thank you very much.

(applause)

This story is about correcting wrong writing.

No, sound is fine. Please correct my mistake.

The Middle East is vast and full of problems, but one thing is for sure: we love to laugh.

I think humor is a great way to celebrate our differences.

We need to take our responsibility seriously, but it's not our own.

Don't get me wrong. The Middle East is not without comedy.

I grew up in a time when iconic Kuwaiti, Syrian and Egyptian actors used laughter to unite their regions, much like football did.

(Laughter.) Now is the time for us to laugh at ourselves before others laugh with us.

This is the story of the rise and rise of stand-up comedy in the Middle East, a stand-up rebellion if you will.

Working as a TV producer and screenwriter in London, I quickly realized that comedy connects audiences.

Now, the best ground for writing good comics is the stand-up comedy circuit. It happens to be said that when it goes well, it kills, and when it goes bad, it blows up.

It may be an unfortunate connection for us, but we are reminded to thank one man who has worked tirelessly over the past decade to support comedians around the world, especially comedians from the Middle East.

(Applause.) Like my good friends Dean and Maysoon, at the bottom of the screen, he started a festival two years after 9/11 to change the way Middle Eastern people see the world.

It's still going strong, and the press is overwhelmingly positive.

An Iranian, a Palestinian, and an Egyptian who have worked in Los Angeles for many years have created a comedy that lives up to its name, Axis of Evil.

And they killed everywhere they went.

Well, I didn't start this fire, but I did put gasoline on it.

I moved to Dubai as head of original content for Western TV networks.

My job was to connect the brand with audiences in the Middle East.

Well, the American program director wanted a new local Arabic comedy.

With a thick Arabic accent, my brain said, "Perfect."

(laughs) Well, I had friends in America.

He was a successful man who founded a new tribe.

And I had every intention of escaping this tribe from the Middle East outliers and crossing the tipping point of success.

As with any new idea, it wasn't easy.

The plan had four phases.

First, we need to buy and broadcast content from the West.

Then I took a friend to show a local amateur how it's done.

I was able to film it, broadcast it, and work with local amateurs to write a new comedy.

I excitedly submitted this to my boss, and his response was, "Hmm, I don't know."

So I went back to my cave to continue supporting and producing comedy and having my friends use my couch as a hub for community activities.

Now let's fast forward two years and think back to early 2007.

The earth turned and so did our management (laughter) and as if by divine intervention things were brought together to help this revolution take shape.

Shows how the dots are connected.

First, members of Axis recorded a special for Comedy Central and aired it in the US, where it became a huge hit on YouTube.

Our new French CEO believed in the power of positive PR.

(laughs) And Idea du Bon Marche.

Let's just say "value for money".

In Dubai, I produced a show for a sold-out venue featuring Ahmed Ahmed's new Axis special.

I invited the new CEO, and as soon as he realized the room was full of heathen laughter, his reaction was pretty simple. "Let's make this happen.

And one more thing, no, don't make a fuss about it. ”

So I immediately got to work with a great team around me.

I happened to find an interesting person who introduces it in Arabic. He was originally Korean and was a perfect fit for the Axis of Evil.

All this is true.

Now, while preparing for the tour, I had to remind my members to be culturally sensitive.

I used the 3 B's from Standup Don'ts in the Middle East. It's about keeping blue content, clean content. Belief, not religion. And the third B, bolistics.

Stay away from Middle East bolics.

Oh, of course, you might wonder what's left without bolistics, sex and religion and how can you make people laugh.

For the answer, take a look at the well-written family sitcoms that have found success in the West.

So did the Axis succeed?

In less than a month, thousands of passionate fans in five countries came to see them live.

Millions of people have seen them on TV and TV news.

In Jordan, I had His Majesty the King come to see me.

In fact, they were so successful that you could buy bootleg DVDs even before they were released in the Middle East.

wherever you go.

So everywhere I went, I auditioned for amateurs.

We filmed the process and aired a documentary.

I named it 'Three Men and Wonho'.

That's really his name.

And this TV and Internet exposure has brought together so many new recruits to our cause.

This year in Dubai, the first all-female domestic stand-up show was just held.

And notice that two of them are wearing scarves. Yes, even they can laugh.

For me, Dubai is like a hand that supports someone who wants to make something happen.

Twenty years ago no one had heard of it.

look now

Thanks to our inspiring leaders, the completion of the world's tallest tower this year is like adding a finger to the hand of all those who spread false stories about us.

(Laughter) (Applause) Well, in just three short years, we've come a long way with stand-up comedy shows in Saudi Arabia.

These cartoons are currently on display at New York festivals.

And Nemr Abu Nassar, the Lebanese genius who introduced us on our first tour, just performed at a legendary comedy club in Los Angeles.

Clearly we are doing our best to change the image from within and it is exploding.

(Laughter) So outsiders, here's CNN's coverage of the 2nd Amman Comedy Festival.

Thank you reporters for doing a great job, but someone forgot to send a positive PR email to the operator of the automatic news ticker shown at the bottom.

For example, when Dean speaks, the ticker reads "United States: Suspect Provides 'Actionable Information'".

Well, if you're used to listening to comedians, I wouldn't be surprised.

Sadly, this leads me to another three B's representing how the Western media treats us as bombers, billionaires and belly dancers.

very.

We are not all mad fanatics trying to kill heathens.

We have positive stories to tell and images to sell.

In fact, one thing is certain, in my experience, we love to laugh to death.

(Laughter) Here are three questions I like to use to test the veracity of our representations in media articles.

One: Is the Middle East depicted in the present time and in the correct context?

(laughter) 2: Do Middle Eastern characters smile and laugh with their eyes closed?

(laughs) 3: Are the Middle Eastern characters played by one person?

Clearly there are mistakes to be corrected.

It has also started in our area.

My challenge to the rest of the world is please start using positive images of the Middle East in your stories.

If you need inspiration, go to festivals or reach out online.

Let's change the story together and start righting the wrongs.

Before returning to the Middle East, I would like to finish by quoting one of the greatest sheikhs to put a quill on parchment.

My father likes to call him "Asheikh Azbare". As my mother used to say, "Shakespeare."

(Laughter) "And now we are content with freedom rather than banishment."

thank you.

(applause)

I was one of the founding members of the Axis of Evil Comedy Tour.

Other founding members included Ahmed Ahmed, an Egyptian-American, who had the idea of ​​actually going to the Middle East to try it out before we joined the tour.

He went solo and did it first.

And then there was Aaron Kader, a Palestinian-American.

And then there was me, the Iranian American in the group.

Now, as you know, being an Iranian-American has its own set of problems.

The two countries are on bad terms these days.

So it causes a lot of inner conflict, part of me likes me but part of me hates me.

(Laughter) Part of my mind is that we should have a nuclear program, and another part is that we cannot trust a nuclear program.

These are the dilemmas I face every day.

But I was born in Iran. I am currently an American citizen. I have an American passport so I can travel.

Because if you only have an Iranian passport, the only countries you can open your arms to are Syria, Venezuela, and North Korea.

(Laughter.) So anyone who gets a passport in America will tell you that when you get your passport, it says what country you were born in.

I remember getting an American passport with it.

I was like, "Wow! I'm going on a trip."

When I opened it, it said "Born in Iran". It's like, "Oh, come on, hey!"

(Laughter) "I'm trying to go to different places."

(Laughter) But what's interesting is that I've never had a problem in the West with an American passport, even if it says "Iranian born." No problem.

It is in some Arab countries that I have a problem.

I think there are some Arab countries that are not on good terms with Iran.

So I was in Kuwait recently doing a comedy show with other American comedians.

That's when border patrol looked at my American passport and said, "Oh, Americans, that's great."

Then he opened it. "You were born in Iran? Wait."

(laughter) And he started asking me questions.

He said, "What is your father's name?"

I said, "He is dead now, but his name was Coslo."

He asks, "What's your grandfather's name?"

I said, 'He died a long time ago.

He said, "Wait, I'll be right back," and left.

And I started to get scared, because I don't know what kind of crap my grandfather was into.

(Laughter) I thought the guy would come back and say something like, "I've been looking for you for 200 years."

(laughs) "Your grandpa has a parking violation. You're too late.

You owe us $2 billion. ”

(laughter) But as you can see, when I speak, I speak with an American accent. As an Iranian-American actor, you would think that I should be able to play any role, good or bad.

But a lot of times in Hollywood, when a casting director finds out you're Middle Eastern, they say, 'Oh, you're Iranian.

Can you say, 'In the name of Allah I will kill you'? "I'm your doctor, right?" ”

They say, "Great! Then you took over the hospital."

(Laughter) Well, I think you're missing the point here.

Don't get me wrong, I don't hate playing villains.

I want to play a villain. I want to rob a bank.

You want to rob a bank in a movie, but not with bombs, but with guns, right?

(Laughter) Because the director imagines, 'Maz, I think your character is carrying a bomb and robbing a bank.'

"Why am I doing that?

If you want money, why should you commit suicide? ”

(laughs) Right?

(Applause) "Give me all my money or I'll blow myself up!"

(laughs) "Then try to blow yourself up.

(laughs) Do it outside. ”

(laughs) But the truth is, there are good people everywhere.

That's what I try to show in my stand-up, good people everywhere.

Only one person is needed to screw it up.

Just like a few months ago, in Times Square, New York, there was a Pakistani Muslim man who tried to detonate a car bomb.

Well, I happened to be watching a comedy show in Times Square that night.

And a few months before that, in Austin, Texas, there was a white American guy who flew a plane to the IRS building, and I happened to be doing a stand-up comedy show in Austin that day.

Now, as a male in the Middle East, I would say that at some point you start feeling guilty if you frequently participate in these activities.

(laughs) I was watching the news. It's like, "Am I in this shit too?"

(Laughter) "I haven't received the note. What's going on?"

(Laughter.) But what's interesting is this Pakistani Muslim man – you see, he's swearing at Muslims, Middle Easterners, Pakistanis all over the world.

One of the things that happened there was that the Taliban in Pakistan took credit for the failed car bombing.

My question is, why take credit for the failed car bombing?

"All we want to say is that we tried."

(Laughs) "And then...

(Laughter) It's the thought that counts. ”

(Laughter) (Applause) "The bottom line is that sometimes you win and sometimes you lose."

(Laughter.) But what happened is, I know all my Middle Eastern and Muslim friends in America were watching TV and saying, "Please, don't be Middle Eastern. Don't be Hassan or Hussein."

And the name that came out was "Jack". It's like, "Wow! That's not one of us!"

But I kept watching the news in case they came back and thought, 'He converted to Islam before he did.

"Damn! Why Jack? Why?"

But as a matter of fact, I've been lucky enough to have the opportunity to perform all over the world, and I've done a lot of shows in the Middle East.

I just went on a solo tour of 7 countries.

I was in Oman and Saudi Arabia.

i was in dubai

And that's great, there are good people everywhere.

And learn great things about these places.

I always encourage people to visit these places.

For example, Dubai -- cool place.

As we know they are obsessed with having the biggest, tallest and longest.

There is a mall called Dubai Mall.

i was walking I heard "beep, beep!" It's like, "What are you doing here?"

He said, "Go to the Zara store. It's five miles away.

(Laughter) And what's crazy is that even Dubai is in recession and you can't tell just by looking at prices.

They sell frozen yogurt by the gram, just like Dubai Mall.

It's like drug dealing.

I was passing by The man said, "Damn! Habibie, my friend."

(laughs) "Do you eat frozen yogurt?"

(laughs) Come over here. come here. come here.

Available in 1 gram, 5 gram and 10 gram. how many grams do you want ”

(laughs) I bought 5 grams. 10 dollars. 10 dollars! I said, "What's in this?"

He's like, "Good, dude, he's Colombian, he's top notch."

(Laughter) Another thing you'll find when you travel in these countries, the Middle East, Latin America, South America, is that often there are no rules or regulations when it comes to making things.

For example, I took my two-year-old son to the Dubai Mall playground.

And I took him to playgrounds all over America.

In America, when putting a 2-year-old on a slide, something is placed on the slide to slow the child down.

Not Middle East.

(Laughter) When I put my 2-year-old on the slide, it made a hissing sound. he took off!

(Laughter.) I went downstairs and said, "Where's my son?" "Third floor, sir. Third floor."

(Laughter) "Take a taxi. Go to Zara. Turn left."

(laughs) "Try the yogurt. It's delicious. It's a little expensive."

(Laughter) But one of the things I try to do in standup is break the stereotypes.

And I've been guilty of stereotyping too.

And they don't get paid that well.

And I understood in my mind that all Indians must be workers.

I forgot that there are apparently successful Indians in Dubai too.

I was doing a show, and they said, "I'll send a driver to pick you up."

When I went to the lobby, there was an Indian man.

“He must be my driver,” I thought, as he stood there, in a cheap suit and a thin mustache, staring at me.

I said, "Excuse me, are you my driver?"

(laughs) I said, "Sorry! Why were you staring at me?"

"I thought you were my driver," he said.

(Laughter) (Applause) (Laughter) I'll leave it at that. With my standup, I strive to break stereotypes and present Middle Easterners and Muslims in a positive light.

I hope that in the years to come, more movies and TV shows will come out of Hollywood and give us a positive light.

who knows? Maybe one day we will have a James Bond. right?

"My name is Bond.

Jamal Bond. ”

(Laughter) Until then, I'll keep joking around. Please keep laughing.

have a good day. thank you.

(applause)

My name is Seth Prebatch. I am the chief ninja of SCVNGR.

I am proud to be a Princeton University dropout.

I am also proud to have moved to Boston where I actually grew up.

(Applause.) Yes, Boston.

Easy win. I'm just going to give you the names of the counties around here.

I'm also pretty determined to build a game layer on top of the world.

This is kind of a new concept and very important. The last decade was the social decade, the decade that built the framework for how we connect with other people, but the next decade will be the decade that the gaming framework is built, determining the motivations that actually influence behavior and the framework within which it is built. This is very important.

You say you want to build a game layer on top of the world, but that's not entirely true. because it is already under construction. it's already happening.

And now it looks like this.

Sounds like the web came out in 1997.

Not very good. Messy.

It's packed with stuff, and in a nutshell, it's not that interesting.

Credit card schemes, airline mileage programs, coupon cards, and all other loyalty schemes actually use game dynamics and build game layers, and they're just awful.

Not very well designed.

(laughs) That's a shame.

But luckily, as my favorite action hero Bob the Builder says, "We can do better. We can build this better."

And the tools and resources you use to build your game layers are the game dynamics themselves.

The core of this presentation is to explain four very important game dynamics, very interesting ones. When used consciously, it can influence behavior for good, bad, and in-between.

Hopefully.

But I want all of us to start consciously thinking about it now, because it's an important stage in building that framework.

Before we get to the point, the question is, "Why is this important?"

What I am arguing is that there is a game layer above the world and building it properly is very important.

The reason this is so important is because what we've seen in the last decade is building the social layer, this framework for connection, and building on that layer is done and done.

There's still a lot to explore, there are still a lot of people trying to understand what social is and how it can be used and how it can be used, but the framework itself is complete and it's called Facebook.

That's okay, right? Many people are very happy with Facebook.

I like it very much.

They created something called Open Graph and they own all of our connections.

They own 500 million people.

So if you want to build a social layer, the framework is set. It's an open graph API.

If that makes you happy, that's great.

If not, I'm sorry. There is nothing you can do.

And it really is.

In other words, we want to build the framework in such a way that it will be accepted and productive in the future.

So the social layer is all about these connections.

The game layer is all about influence.

It's not about adding a social fabric to the web to connect with other people wherever they are, it's really about harnessing dynamics and harnessing power to influence the behavior of where you are, what you do there, and how you do it.

It's really, really powerful.

And it will become more important than social strata, and will affect our lives in a deeper and perhaps even more intangible way.

So at this point in time when frameworks like Facebook and Open Graph are being built as the equivalent of the game layer, it's very important to think about it very consciously and do it in a way that is open, available, and can be leveraged forever.

This is what I want to talk about game dynamics. Because construction is just beginning, and the more consciously we can think about this, the better we can use it for whatever we want.

As I said earlier, the way you build through game layers is not with glass, steel, and cement.

And the resources we use are not this two-dimensional piece of land that we own.

Resources are mindshare, tools and raw materials are game dynamics.

Going back to SCVNGR, I want to joke that seven game dynamics can make anyone do anything.

I'm sharing four today because I'm hoping that when this work is done, we will still have a competitive advantage.

(Laughter) The first one is very simple game dynamics.

It's called Appointment Dynamic.

This is the dynamic for success, players have to do something at a predetermined time and usually in a predetermined place.

And these dynamics can be a little scary at times. Because I believe that other people may be using my power to manipulate the way I interact with them: what I do, where I do it, when I do it, and so on.

This kind of "loss of free will" that happens in games is terrifying.

So here are three examples of each dynamic. One is how it's already used in the real world and can be streamlined a bit. It's what we think of as a traditional game and shows it. I think everything is a game, but rather this is what you think of as a game played on a board or on a computer screen. And one of the ways to use it for good is that these forces prove to be very powerful.

The first is the most famous promise mechanism in the world, called "happy hour".

So, I just dropped out of Princeton University, and when I actually went to a bar for the first time, I saw happy hours everywhere.

And this is simply the dynamic of the reservation. Come here at certain times for half price drinks.

The mechanics of this game are so powerful that they don't just affect our actions. It has affected our entire culture.

It's a really scary idea that just one game's dynamics can change things so powerfully.

This also exists in more traditional game formats.

I'm sure you've all heard of Farmville.

If you haven't played it yet, I encourage you to do so.

You don't have to do anything else for the rest of the day.

Farmville has more active users than Twitter.

It's incredibly powerful and has the dynamic of having to return to a specific time to water your fake crops. Otherwise the crop will die.

And this is so powerful that when they adjust their stats to say crops wilt after 8 hours, 6 hours, or 24 hours, it changes the life cycle of about 70 million people a day.

They come back at different times, like clockwork.

I mean, if you want to end the world, if you want to stop being productive, turn it into a 30 minute cycle and nobody can do anything else, right?

(Laughs) That's a little scary.

But this can also be used for good.

This local company called Vitality has developed a product that helps people take their medicine on time.

It's a promise.

That's something people can't do very well.

They feature GlowCaps that blink, send emails, and do wonderful things to remind you to take your medicine.

This isn't a game yet, but it should be.

You need to earn points if you do it on time and lose points if you don't do it on time.

They need to realize that they are building a booking dynamic and capitalize on their game.

Then you can achieve really good things in some interesting ways.

Move on.

influence and status.

It's one of the most famous game dynamics and it's used everywhere.

It's now in your wallet.

The leftmost credit card is black, so everyone wants it.

And then there's CVS, or not CVS, people like Christian Dior (laughter) I don't know. i don't have a black card I have a debit card.

(Laughter) So they nailed it out and you look at that black card and say, 'I want that, it means they're cooler than me, so I need it.'

And this is also used in games.

"Modern Warfare" is one of the best-selling games of all time.

I'm still level 4, but I really want to be level 10. Because they have cool red badges. It means that I am better than others.

And that's very powerful for me.

It's also used in more traditional settings, where it can be used more consciously.

School--and remember, I've made it through the year and feel qualified to talk about school--is a game. It's not a very well designed game.

There are levels. there is a C. there is a B. there is an A.

There is also status. So what is valedictorian, not status?

I think people would probably work harder if they called the valedictorian "white knight paladin level 20".

(Laughter) (Applause) So school is a game, and there's been a lot of experimentation on how to do this properly.

But use it consciously.

Why are some games okay to lose? Why does it change from A to F or B to C?

It sucks. Why don't you level up?

Princeton University is actually experimenting with this, and earning experience points in a quiz will level you up from a B to an A.

And it's so powerful.

You can use it interestingly.

For the third, we discuss the dynamics of progress. This has to progress through various steps in a very granular way.

It's used everywhere, including LinkedIn where I'm an imperfect individual.

I'm only 85% done on LinkedIn so far, and that's worrying me.

And this is so ingrained in our psyche that when we see a progress bar and are presented with simple, detailed steps to follow to complete that progress bar, we do it.

Find a way to move that blue line to the right edge of the screen.

This is also used in traditional games.

So this is a level 10 paladin and that one is a level 20 paladin.

And if you're going to fight Orcs and Ra's al Ghul in the fields of Mordor, you probably want to be a bigger Orc, right?

I would.

So people work hard to level up.

"World of Warcraft" is one of the most successful games of all time.

If you're the most avid player, the average player spends about six, six and a half hours a day on it. It's like a full-time job, it's insane.

And there is a system that allows you to level up.

And that's a very powerful thing. Progress is powerful.

It can also be used for good in very convincing ways.

One of the things we do at SCVNGR is how we use games to drive traffic and business to local businesses and things that are very important to the economy.

And here are the games people play.

They go to different locations, do challenges and earn points.

We then introduced a progression dynamic where going to the same place over and over again, completing challenges, and doing business moves the green bar from the left edge of the screen to the right, unlocking rewards.

This is powerful enough that it turns out that it can draw people into these dynamics, draw them back to the same local business, generate loyalty, generate engagement, and bring meaningful revenue and enjoyment and engagement to the company.

These progression dynamics are powerful and can be used in the real world.

The last thing I want to talk about, which is the perfect story to end, is this concept of co-discovery, the dynamics where everyone has to work together to get something done.

Co-discovery is powerful because it leverages the social network to solve problems.

It's used in popular consumer web stories like Digg, and I'm sure you've heard of it.

Digg is a community dynamic that seeks to find and acquire the best news, most interesting articles.

And at first I made this into a game.

They had a leaderboard where they got points for recommending the best stories.

And that's what motivated people to find the best stories.

But it turned out to be so powerful that there was actually a Cabal, a group of the top seven people on the leaderboard, who would endorse people's stories while working together to make sure they held their ground.

It was a game that was more powerful than the goal.

In the end, they closed the leaderboard. That's because leaderboards, while effective, were so powerful that they stopped providing the best stories and forced people to work harder to maintain leadership.

So this should be used with caution.

It's also used in things like McDonald's Monopoly, where the game isn't the Monopoly you're playing, it's a cottage industry formed to find the boardwalk.

Just look for a sticker that says "Boardwalk" there, but it can also be used to find the real thing.

This was DARPA's balloon challenge, where they hid two balloons across the United States and said, "Use the network to find these balloons fast. The winner will be awarded $40,000."

The winner was a group from the Massachusetts Institute of Technology who created a pyramid scheme-like network in which the first person to nominate a balloon location was awarded $2,000, and others who promoted their nominations were given a cut.

And within 12 hours, we could find all these balloons all over the country.

A really powerful dynamic.

With about 20 seconds left, I have something to say, but this decade has been the decade of social.

The next decade will be the decade of gaming.

We build it with game dynamics. We build on mindshare.

We can influence behavior.

Very powerful. It's very exciting.

Let's all make it together, make it well and have fun.

I feel like we are all suffering from information overload and data overload.

And the good news is that there may be a simple solution to that, and it's using our eyes more.

This means visualizing information to see important patterns and connections, making it more meaningful, telling a story, and designing it to focus only on the important information.

Failure to do so will only make the information visualized look really cool.

So let's see.

This is a billion dollar ogram and this image was born out of my frustration with the billion dollar coverage in the press.

So $500 billion in this pipeline, $20 billion in this war, etc., without context, it's meaningless.

I don't know what it means, so I can only understand it visually and relatively.

So I collected a large number of figures reported by various news outlets and scaled the boxes accordingly.

And the colors here represent the motivation behind money.

In other words, purple means 'fighting', red means 'handing out money', and green means 'making a profit'.

And what is immediately apparent is that we are beginning to have a different relationship to numbers.

You can literally see them.

But more importantly, we're starting to see patterns and connections between numbers that would normally be scattered across multiple news reports.

Let me list a few that I really like.

This is OPEC revenue, the green box here - 780 billion a year.

And this little pixel in the corner - 3 billion - that's their climate fund.

Americans are incredibly generous people, giving more than 300 billion to charities each year, compared to 120 billion in foreign aid for the 17 most industrialized nations.

Then, of course, the war in Iraq, which in 2003 was projected to cost just $60 billion.

And it became slightly mushroomed. Afghanistan and Iraq have now surged to 3 trillion.

Now that we have this texture, we can add numbers to it, which is great.

So let's just say there are new numbers out there...let's look at Africa's debt.

How much of this figure do you think is Africa's debt to the West?

Let's see.

So 227 billion is Africa's debt.

And given the recent financial crisis, how much does that figure account for in this chart?

What did it bring to the world? Let's see it.

Doosh -- I think it's a worthy sound effect for a hefty sum of 11.9 trillion.

So, by visualizing this information, we turned it into a landscape that we could explore with our eyes, a kind of map, an information map.

When information gets lost, an information map can help.

Therefore, I would like to introduce another scenery this time.

We have to imagine what the horror landscape of the world looks like.

Let's see.

This is Molehills Out of Molehills, a timeline of global media panic.

(Laughter) So let's label this right away.

But what I want to point out here is the intensity of the kind of fear that is being reported in the media.

let me point them out.

This is swine flu, pink.

Avian influenza.

SARS -- brownish here. Remember that?

Millennium bug, terrible disaster.

These small green peaks are asteroid impacts.

(laughs) And in the summer, the killer wasps are here.

(Laughter.) These are what our fears look like over time in our media.

But what I love is being a journalist and finding hidden patterns. I love being a data detective.

And this data hides some very interesting and bizarre patterns that can only be seen when visualized.

Let me emphasize that.

Look at this line. This is a violent video game landscape.

As you can see, there is some sort of strange regular pattern in the data, with twin peaks occurring each year.

A closer look reveals that these peaks occur in the same month each year.

why?

Well, in November there will be a Christmas video game, which may raise concerns about its content.

But April isn't a particularly big month for video games.

why april?

Well, the Columbine massacre happened in April 1999, and since then the horror has been remembered by the media and gradually echoed in collective minds throughout the year.

There are retrospectives, anniversaries, trials, and even copycat shootings, all of which put that terror on the agenda.

And there is another pattern here as well. can you find it?

Can you see the gap there? There's a gap that affects every other story.

Why is there a gap there?

Do you know where to start? In September 2001, we had a really scary experience.

I've been working as a data journalist for about a year now and I hear this phrase all the time. "Data is the new oil".

Data, like a ubiquitous resource that can be shaped to provide new innovations and new insights, is all around us and very easy to mine.

In this day and age, especially if you live around the Gulf of Mexico, it's not a particularly great metaphor, but perhaps I'd rearrange the metaphor a bit and say that data is new soil.

Because to me it feels like a fertile and creative medium.

Over the years, we have amassed vast amounts of information and data online, irrigated with networks and connections, worked and cultivated by unpaid workers and governments.

And okay, I'm milking the metaphor a little bit.

But this is a really fertile medium, and visualizations, infographics, data visualizations, etc. feel like blossoming from this medium.

But when you look at it directly, it's just a bunch of numbers and disconnected facts.

But when you start playing with it a certain way, interesting things emerge and different patterns can be revealed.

Let me show you this.

Can you guess what this dataset is?

What rises twice a year, two weeks before Easter and Christmas, has a small peak every Monday, and then levels off over the summer?

Accept answers.

(Audience: Chocolate.) David McCandless: Chocolate.

You might want to put some chocolate in there too.

Any other guesses?

(Audience: Shopping.) DM: Shopping.

Well, retail therapy might help.

(Audience: Sick leave.) DM: Sick leave. Well, you should definitely take some time off.

Shall we take a look?

(Laughter) (Applause) So, information guru Lee Byron and I collected 10,000 Facebook status updates for the phrases "break up" and "break up." And this is the pattern we've found -- people leaving home for spring break, (laughs) coming out of a very bad weekend on Monday, being single for the summer, and the coldest day of the year, Christmas Day, of course.

who would do that?

As such, there is currently an unprecedented amount of data.

But if you ask the right kinds of questions and ask them in the right way, interesting things can emerge.

That's why information is beautiful. Data is beautiful.

Can I make my life beautiful?

And here is my visual resume.

I'm not sure if I succeeded.

Quite blocky and the color is not that good.

But there was something I wanted to tell you.

I started out as a programmer, worked as a writer in print, online and advertising for almost 20 years, and recently started designing.

And I never went to design school.

I never studied art or anything like that.

I actually tried it and somehow learned.

And when I started designing, I realized something strange about myself.

I already knew how to design, but it wasn't amazing, I was more sensitive to concepts of grids, spacing, placement and typography.

I feel that my exposure to this kind of media over the years has instilled in me a kind of dormant design literacy.

And I don't feel that I am special.

Every day we all feel like we're under an information design storm.

It's pouring into our eyes through the web, and now we're all visualizers. We all want the visual side of information.

There is something almost magical about visual information.

It's easy and literally poured.

And when you're navigating a dense information jungle and come across beautiful graphics and lovely data visualizations, it feels like you've stepped into a jungle frontier.

This intrigued me, which led me to the work of a Danish physicist named Thor Nolltlanders. He translated sensory bandwidth into computer terms.

So let's go. This is your sense, infused into your senses every second.

Your sight is the fastest.

It has the same bandwidth as a computer network.

In addition, it enables touches at almost the same speed as a USB key.

It also has hearing and smell, and has the processing power of a hard disk.

And it has a poor old fashioned sense, like a pocket calculator has very little processing power.

And the little square in the corner, 0.7 percent, that's how much we actually perceive.

So a large part of your vision is visual, and it flows.

it is unconscious.

The eye is very sensitive to changes in color, shape and pattern.

It loves them and calls them beautiful.

It's the language of the eye.

When you combine the language of your eyes with the language of your mind about words, numbers and concepts, you start speaking two languages ​​simultaneously, each reinforcing the other.

In other words, I drop the concept after having an eye.

And it's all two languages ​​working together.

So you can use this new kind of language to change your perspective and change your point of view if you want.

Let me ask you a simple question with a very simple answer. Who has the largest military budget?

It has to be America, right?

Large scale. 609 billion in 2008, or rather 60.7 billion.

In fact, it is so large that it could fit all the world's military budgets inside it.

Gobble, gobble, gobble, gobble, gobble.

Well, here you can see the total African debt and the UK budget deficit for reference.

So this might fit well with your view that America is a kind of warmongering military institution trying to overwhelm the world with a huge industrial-military complex.

But is it true that America has the largest military budget?

Because America is an incredibly rich country.

In fact, it is so rich that it could fit the economies of other major industrialized nations within its borders.

Therefore, the military budget should be enormous.

So, in fairness, we need to introduce another dataset to change our perspective. That dataset is GDP, or country income.

Who has the highest budget as a percentage of GDP?

Let's see.

It changes the image considerably.

Other countries you probably didn't consider come into view, and the United States drops to number eight.

You can now do this for soldiers as well.

Who has the most soldiers? It must be China.

2.1 million, of course.

Again, I agree with your view that China has a military government ready to mobilize a huge army.

But, of course, China has a huge population.

So when we do the same thing, we see a fundamentally different situation.

China dropped to 124th place.

Considering other data, there is really only a small army.

So in a connected world, absolute numbers like military budgets don't tell the whole story.

They are as untrue as possible.

To get the big picture, you need relative numbers that are correlated with other data. Doing so can lead to a change of perspective.

My mentor, Hans Rosling, said, 'Datasets change the way you think'.

If you can do that, your behavior may also change.

Look at this.

I'm a bit of a health freak.

I love taking supplements and getting healthy, but I can never understand what's going on in terms of evidence.

There is always conflicting evidence.

Should I take vitamin C? Should I take wheatgrass?

Here's a visualization of all the evidence for nutritional supplements.

Such a diagram is called a balloon race.

Therefore, the higher up in the image, the more evidence there is for each supplement.

And the bubble corresponds to the popularity of Google's hits.

So not only can you quickly see the relationship between effectiveness and popularity, but you can also score the evidence and make a "worthy" decision.

So supplements above this line are worth investigating, but only apply to the conditions listed below, supplements below the line are probably not worth investigating.

Now, this image will be a huge amount of work.

We collected about 1,000 studies from the biomedical database PubMed, compiled them, and scored them all.

And very frustrating for me. Because I had to create a book with 250 visualizations for the book, and I spent a month doing this and only filled 2 pages.

But what it does point out is that this kind of information visualization is a form of knowledge compression.

It's a way of squeezing vast amounts of information and understanding into a small space.

And then you pick that data, clean that data, and when the data is there, you can do amazing things like this.

So I converted this to an interactive app. Now you can generate this application online. Here's an online visualization. And now I can say, "Oh, that's great."

So it generates itself.

And then you can say, "Now show me what affects heart health."

Now let's filter it.

Hearts are filtered out so you know if you're interested in it.

I think "No, no. I don't want to take anything synthetic. I just want to see plants. Show me herbs and plants. I have all natural ingredients."

Now this app is automatically generated from your data.

All of our data is stored in Google Docs, literally automatically generated from that data.

So the data is still alive today. Since this is a living image, it can be updated on the fly.

New evidence emerges. Just change the rows in the spreadsheet.

Dosh! Again, the image will rebuild itself.

That's why it's cool.

It's a kind of creature.

But it can go beyond data and numbers.

I like to apply information visualization to ideas and concepts.

It is a visualization of the spectrum of politics, an attempt to understand how it works and how ideas permeate and recirculate from government to society, culture, families, individuals and beliefs.

What I love about this image is that it's conceptual, explores our worldview, and helps us understand what other people are thinking and where they're coming from. It works for me anyway.

And it feels incredibly cool to do.

What was most exciting to me when designing this was that when designing this image, I am a journalist and a leftist, so I desperately wanted the left side to be better than the right side, but I just couldn't do it. This is because it creates a skewed and skewed diagram.

So to actually create a complete image, I had to respect the perspective on the right, but at the same time, I had to be uncomfortably aware of how much of those qualities I actually have within myself, which was very annoying and uncomfortable.

(Laughter) But it's not that bad. Because there is something non-threatening about looking at the political point of view rather than being told or heard.

When you see conflicting points of view, you are willing to hold onto them.

It's even more fun to engage with them because they're visual.

I mean, it's interesting to me to see how data can change my perspective and change my mind along the way—how beautiful, nice data can change.

In conclusion, I wanted to say that I feel that design is about solving problems and providing smart solutions, and information design is about solving information problems.

Right now, our society feels like there are many information problems, from overload and saturation, to crumbling credibility and credibility, to runaway skepticism and lack of transparency, or just plain fun.

The information is just too interesting.

It has a magnetism that attracts me.

Therefore, visualizing information provides a very quick solution to this kind of problem.

Even when the information is terrible, the visuals can be very beautiful.

Like the recent Icelandic volcano, we can get clarity and answers to simple questions quickly.

Which was emitting the most CO2?

Was it a plane, was it a volcano, was it a plane that landed, or was it a volcano?

So let's see.

Looking at the data, we can see that: Yes, the volcano ejected 150,000 tons. A plane on the ground in the air would have released 345,000 rounds.

So, in essence, we have the first carbon-neutral volcano.

(Laughter) (Applause) That's beautiful. thank you.

(applause)

Let's go to Antarctica, the bottom of the world, together. This is the highest, driest, windiest, and yes, coldest region on Earth. It is drier than the Sahara Desert and colder than Mars in some areas.

Antarctic ice glistens with blinding light, blinding the unsuspecting eye.

Early explorers rubbed cocaine in their eyes for pain relief.

The weight of ice is such that entire continents sink under its weight.

But Antarctic ice is a calendar of climate change.

It records annual rises and falls in greenhouse gases and temperatures, going back before the beginning of the last ice age.

No other place on earth provides such a perfect record.

And here, scientists are digging into Earth's past to find clues to the future of climate change.

In January of this year, I traveled to a place called the WAIS Divide, about 900 miles from the South Pole.

Many say this is the best place on earth to study the history of climate change.

There, about 45 scientists from the University of Wisconsin, Nevada's Desert Research Institute, and others are working to answer central questions about global warming.

What is the exact relationship between greenhouse gas levels and planetary temperature?

It's an urgent job. We know the temperature is rising.

This year's May was the warmest on record globally.

And we know that the level of greenhouse gases is also rising.

What we don't know is the precise, precise, and immediate impact these changes will have on natural climate patterns such as wind, ocean currents, precipitation, and cloud formation that affect the health and well-being of billions of people.

Their entire camp, all equipment, was ferried 1,385 miles from McMurdo Station, a major U.S. supply base on the coast of Antarctica.

The WAIS Divide itself is lined with tents in the snow.

During a blizzard, the crew throws ropes between the tents, allowing people to move safely to the nearest icehouse or outdoor hut.

There was so much snow there that the facility was buried almost immediately.

In fact, the researchers chose this location because ice and snow accumulate ten times faster here than anywhere else in Antarctica.

They have to dig themselves up every day.

Make your commute exotic and chilly.

(Laughter) But underneath the surface, there's a lot of industrial activity around the $8 million drill assembly.

The drill, similar to a biopsy needle, regularly plunges into ice thousands of feet deep and extracts bone marrow for gas and isotopes for analysis.

They extract cylinders of compacted ice crystals ten feet long ten times a day. It contains trace amounts of chemicals deposited by unpolluted air and snow over thousands of years.

It's just a time machine.

At the peak of activity earlier this year, researchers lowered the drill 100 feet deeper into the ice each day, an additional 365 years into the past.

Periodically remove the ice cylinders, like a gamekeeper removing a used shotgun case from the barrel of a drill.

They inspect it and check for cracks, drill damage, splinters and chips.

More importantly, it tests for 40 climate-relevant trace chemicals (some in a million trillion) in preparation for testing and analysis by 27 independent laboratories in the United States and Europe.

Yes, I said it in Q, 10 trillion.

They cut the cylinders into 3-foot sections for easier handling and shipped them back to these laboratories, about 8,000 miles from the drill site.

Each cylinder is a parfait of time.

This ice formed as snow 15,800 years ago when our ancestors were painting and contemplating a radical new technology called the alphabet.

When cut in cross-section under polarized light, this ancient ice appears as a mosaic of colors, each showing how depth conditions in the ice affected the material at depths where pressures reached 1 tonne per square inch.

Every year, starting with the snowflakes, digging into the fresh snow gives us an idea of ​​how this process is currently progressing.

This flat wall of snow is backlit by the sun, revealing layers of winter and summer snow stripes.

Each storm washes out the atmosphere, washing away dust, soot, and trace chemicals, depositing them on snowpacks for millennia and millennia, creating a sort of periodic table of the elements, now over 11,000 feet thick.

From this we can detect a surprising number of things.

Calcium from deserts around the world, soot from distant wildfires, and methane as an indicator of the strength of the Pacific monsoon can be found drifting on the wind from warm latitudes to this remote, frigid location.

Most importantly, these cylinders and this snow trap air.

Each cylinder contains about 10% ancient air and is a pristine time capsule of greenhouse gases (carbon dioxide, methane, nitrous oxide), all unchanged from the day the snow formed and first fell.

And this is the subject of their scrutiny.

But we already know what we need to know about greenhouse gases, don't we?

Why should I study more?

You already know how they affect temperature, don't you?

We already know the impact of climate change on our settled civilizations, don't we?

In fact, we only know the outline, so we can't properly fix what we don't fully understand.

In fact, we run the risk of making the situation worse.

Consider the Montreal Protocol, the most successful international environmental action of the 20th century. The protocol united the nations of the globe to protect the planet from the harmful effects of the ozone-depleting chemicals used in air conditioners, refrigerators and other cooling devices at the time.

We have banned those chemicals and unknowingly replaced them with other substances that are 100 times more powerful than carbon dioxide as a heat-trapping greenhouse gas.

This process requires special precautions.

Scientists have to make sure the ice is uncontaminated.

Plus, we have to make sure this ice doesn't melt on this 8,000-mile journey.

Imagine yourself juggling snowballs in the tropics.

In fact, they have to keep this ice from getting more than about 20 degrees below zero. Otherwise, important gases in the ice will be lost.

That's why they work inside refrigerators in the coldest places on earth.

In fact, they keep extra gloves warm in the oven when handling ice. That way, even if your gloves freeze and your fingers get stiff, you'll be able to wear new gloves.

They work against clocks and thermometers.

So far, they've packed about 4,500 feet of ice core for shipping back to the US.

Last season, they man-powered them across the ice to a waiting aircraft.

The 109th Air National Guard airlifted the latest ice shipments to the coast of Antarctica, where they were loaded onto cargo ships, transported across the tropics to California, unloaded and loaded onto trucks, and taken across the desert to the National Ice Core Laboratory in Denver, Colorado. As we speak, scientists are now slicing this material for samples, analyzing it, and distributing it to laboratories across the country and Europe.

Antarctica was the last blank spot on the planet, a blind spot in our expanding worldview.

Early explorers sailed off the edge of the map, discovering places where the usual rules of time and temperature seemed to be disrupted.

Here the ice seems alive.

The rustling wind gives voice.

It is the voice of experience.

That's the voice we should listen to.

thank you.

(applause)

Cartoons are basically short stories.

I tried to find something that didn't contain many words.

Not all of them have happy endings.

So how did I start drawing cartoons?

I used to do graffiti when I was a kid. Spend enough time doodling and sooner or later something will happen. In other words, all career options are gone.

So I have to make a living by drawing comics.

Actually, when I was little, I fell in love with the ocean when I was about 8 or 9 years old.

And I was especially fascinated by sharks.

This is part of my early work.

In the end, my mother took the red crayon with me, so it became 【unclear】.

But I want to share with you an experience from my childhood that really changed the way I see the ocean. It forms the basis of my work. Because I believe that if we can change the way we see the ocean in one day, we can inspire others to do the same, especially children.

Until that day, I had seen the sea like this.

It's just a big blue surface.

This is how we have seen the sea since time immemorial.

It's a mystery.

A lot of folklore has sprung up around the sea, mostly negative.

So people started making maps like this. There are many wonderful details about the land, but when you get close to the water's edge, the sea looks like a giant puddle of blue paint.

And this is how I looked at the sea at school - as if to say, "All geography and science classes end at the water's edge."

This part will not appear on the test. ”

But that day, I flew low over the islands in a small plane on a family trip to the Caribbean.

Here is what i saw. I could see hills and valleys.

I could see forests and meadows.

I've seen caves, secret gardens, and places I'd love to hide in if I could breathe underwater when I was a kid.

And best of all, we got to see the animals.

I saw a manta as big as the plane I was on.

And I flew over a lagoon with sharks. That day was the day my shark cartoon was born.

From that day on, I was just a normal kid roaming dry land, but my head was in the water.

Until that day, these were the most common animals in my life.

These were what I wanted to draw - 4 legs and all variations of fur.

But once in the ocean, my imagination was no match for nature.

Every time I came up with a crazy cartoon character on the drawing board, I found even crazier creatures in the sea.

And the difference in scale between this tiny sea dragon and this giant humpback whale was like something out of a sci-fi movie.

Whenever I talk to children, I like to say that the biggest animal that ever lived is still alive.

It's not a dinosaur. It was a whale, an animal the size of an office building that still swims around our oceans.

Speaking of dinosaurs, sharks are basically the same fish they were 300 million years ago.

So if you've ever fantasized about going back in time and seeing what dinosaurs looked like, that's what dinosaurs look like.

This means that there are living dinosaurs and aliens, animals that evolved in a harsh environment with zero gravity.

It's really unbelievable. Hollywood designers can't come up with something more interesting.

Or this fang. Particles in the water make it look like you are floating in space.

Can you imagine looking into the Hubble telescope and seeing that?

It would be the beginning of a whole new space race.

But instead, we plunge cameras into the deep sea and see fish, but that doesn't capture our imagination as a society.

"Maybe we can make fish sticks or something with this," we think.

So, I think I'll try drawing a little more this time.

So, let's draw this fang here.

I love drawing deep sea fish. Because deep-sea fish are so ugly, but beautiful in their own way.

You might want to give him a little bioluminescence here - give him headlights, maybe brake lights, turn signals.

But it's easy to see why these animals make such wonderful cartoon characters, their shapes and sizes.

As such, some of them actually seem to have superhero-like powers from comic books.

Take these sea turtles, for example.

They have a sixth sense like Superman's x-ray vision.

They can sense the Earth's magnetic field.

And they can use that sense to navigate hundreds of miles of open ocean.

I give the turtle a hand and make it a manageable cartoon character.

Alternatively, take this sea cucumber.

Not the animals we cartoon or draw at all.

It's like spiderman underwater.

He launches these sticky nests to entangle his enemies.

Of course, sea cucumber shoots sea cucumber out of its ass, and I think that's what makes sea cucumber more interesting as a superhero.

(Laughter) He can't always spin a web. He has to pull down his pants first.

(laughs) Or puffer fish.

Pufferfish resembles the Incredible Hulk.

It can transform its body into a gigantic and intimidating fish in a matter of seconds.

I will draw this blowfish without inflating it.

And here we try the on-screen animation.

let's see.

Try inflating it.

(Laughter) "Are you talking to me?" See, he can exaggerate himself when he wants to be intimidating.

Alternatively, pick up this swordfish.

Can you imagine being born with tools for your nose?

Do you think he wakes up in the morning, looks in the mirror and says, "Someone got stabbed today"?

For example, this lionfish.

Imagine trying to make a friend covered in razor-sharp, poisonous spines.

It's not something you put on your Facebook page, is it?

My character, my main character is a shark named Sherman.

he is a great white shark

And I kind of broke the mold with Sherman.

I didn't want to go for the image of this ruthless predator.

It's like he's just there and making a living.

He's like Homer Simpson with fins.

And his sidekick is, as we mentioned earlier, a sea turtle named Fillmore.

He uses his marvelous navigational skills to wander the seas in search of a mate.

And he managed to find them, but with great navigation skills and terrible pick-up lines.

He never seems to settle for a particular girl.

I have a hermit crab named Hawthorn, who is not very respected as a hermit crab and would like to be a great white shark.

Then I'll introduce another character. This guy, Ernest, is basically a juvenile delinquent in the body of a fish.

In other words, you can use the characters to create a story.

Creating a story can be as simple as putting two characters in a room and seeing what happens.

So imagine a great white shark and a giant squid in the same bathroom.

(Laughter) Or, because it's underwater, it takes people to places they've never heard of.

For example, I took them to the Mid-Atlantic Mountains, the mountains in the middle of the Atlantic Ocean.

I took them to the Sea of ​​Japan where they met a giant jellyfish.

I took them camping in a kelp forest in California.

Next, we talked about the census of marine life.

And it was a lot of fun. Because, as most of you know, this is a real project that we've heard of.

But it was an opportunity for me to introduce my readers to a bunch of crazy undersea characters.

So the story begins with Ernest, who is volunteering as a census taker.

As he descended, he came across this famous anglerfish.

He then encounters the Yeti Crab, the famous Vampire Squid (elusive and hard to find), and the Dumbo Octopus. Dumbo Octopus looks so much like a real-life cartoon that I didn't have to change anything when I drew it.

I also wrote another article on marine debris.

I was talking to a lot of my conservation friends, and I asked them, "So what are the issues you want people to know more about?"

And they said -- one of my friends said, "I just want to tell you one thing: plastic."

So I said to him, 'Well, I need something a little sexier than that.

Plastic alone cannot do that. ”

we worked it out.

They wanted us to use words like polyvinyl chloride, which is not very effective in speech bubbles.

It didn't fit well.

So what I did was write an adventure novel.

Basically, this bottle can travel long distances.

My point to readers is that plastic isn't really going away. It just keeps flowing downstream.

And much of it ends up in the ocean. Tying a few characters into this makes for a great story, especially when they can't antagonize each other like these two.

So I sent them to Boise, Idaho, where they dropped a plastic bottle into Boise's sewer system.

And it flows into the Boise River, then into the Columbia River, into the mouth of the Columbia River, into the Pacific Ocean, and then into this place called the Great Pacific Garbage Patch. It's a giant Pacific Gyre in the North Pacific Ocean that ends up with tons of plastic drifting into it. and returned to the lagoon.

It was basically a buddy story featuring plastic bottles.

A lot of people remember plastic bottles anyway, but that course actually talked about marine litter and plastic.

The third storyline I made about a year and a half ago was probably the hardest for me.

It was about shark fin fishing, and I felt very strongly about this issue.

And since my main character was a shark, I felt this comic was the perfect vehicle to bring this to the world.

Well, plucking is the act of catching a shark, cutting off its precious fins, and putting the live animal back into the water.

Cruel, useless.

Nothing interesting, but I wanted to bring up this issue.

I had to kill the main character who is a shark.

We start with a shaman in a Chinese restaurant. The shaman gets lucky when he is nearly caught by a trawler, and is actually caught.

and he dies.

He is finned and then thrown overboard.

Officially, he's dead.

So I killed someone who was in the newspapers for 15 years.

So I got a lot of feedback from readers about it.

Meanwhile, the other characters are talking about shark fin soup.

Then create 3-4 strips investigating the fin problem and the shark fin soup problem.

Sherman is in shark heaven.

This is what I love about comics.

If you start with a talking shark, you don't have to worry about the audience withholding that disbelief, because the reader pretty much confirms that disbelief at the entrance.

I can do anything.

It is a near-death experience for shamans.

Meanwhile, Ernest finds his fins on the Internet.

There was a website based in China that actually sold shark fins, so I exposed it.

Then click the "Buy Now" button.

And, voila, the next day they show up and are surgically reattached.

I ended the series with a sort of mail petition encouraging the National Marine Fisheries Service to force other countries to take a stronger stance on shark management.

(Applause.) Thank you.

I would like to end with a little metaphor here.

I tried to think of a metaphor for Mission Blue, and this is what I came up with.

Imagine you are in a huge room, but dark as a cave.

And in that room you can put whatever you want, but you can't see anything.

You have been given one tool, a hammer.

So if you walk around in the dark and bump into something, it feels like it's made of stone.

It's big and heavy. You can't take it away, so hit it with a hammer to break up the pieces.

Then take the piece out in the sunlight.

And then you can see the beautiful white alabaster.

So you say to yourself, "It's worth something."

So go back to your room, break it up and carry it away.

Then find the others, break it and carry them away.

And we're getting all kinds of great stuff.

And I hear others doing the same.

This creates a sense of urgency to find as many things as possible as quickly as possible.

And some shout, "Stop!"

And they light up.

and you know where you are. You are in the Louvre Museum.

And you've taken all this complexity and beauty and turned it into a cheap commodity.

That's what we do to the ocean.

And part of what Mission Blue is about is yelling "Stop!"

So that each of us, explorer, scientist, cartoonist, singer, chef, etc., can light up in our own way.

And I hope that my comics will be of some help.

That's why I love what I do.

Thank you for listening.

(applause)

It's great to be back.

I love this wonderful gathering.

And you must be thinking,

Did they post the wrong slide? ”

No no.

See this magnificent beast and ask who designed it.

This is TED. This is technology, entertainment, design, and dairy cows.

A very well designed animal.

And I thought about how to introduce this.

And I thought it might be Joyce Kilmer's old dog. "Poetry is made by fools like me, but only God can make a tree."

And you might say, "Yes, God designed the cow."

But, of course, God had a lot of help.

This is the ancestor of cows.

This is the aurochs.

And it was designed by millions of years of natural selection, the process of natural selection.

And it was domesticated thousands of years ago.

And mankind became its manager, gradually redesigning, redesigning, redesigning, without knowing what they were doing.

And just recently, they started to reverse-engineer this beast in earnest, figuring out what a part is, how it works and how it can be optimized – how to make it better.

Now, why am I talking about cows?

Because I want to say that the same applies to religion.

Religion is a natural phenomenon, as natural as a cow.

They have evolved over thousands of years.

They have a biological basis just like the aurochs.

They have been domesticated and humans have been redesigning their religions for thousands of years.

This is TED. I would like to talk about design.

Because what I've been doing for the last four years is actually when you first saw me. Some people have seen me talk about religion at TED, and I've been working on it almost non-stop for the last four years.

And you might say it's about reverse engineering religion.

Now, I think that very thought causes fear, anger, or some kind of anxiety in many people.

And that's the spell I want to break.

What I mean is, "No, religion is an important natural phenomenon."

We need to study them, as we eloquently heard last night from Al Gore, with the same focus as we study all other important natural phenomena like global warming.

Religions today are brilliantly designed, brilliantly designed.

These are very powerful social institutions, and many of their functions can be traced back to earlier functions that can actually be understood by reverse engineering.

And just like with cows, there is a mixture of evolutionary design (designed by natural selection itself) and intelligent design (design that is more or less intelligent), redesigned by humans trying to redesign religion.

I don't do book talks at TED, but I'll just show you one slide about my book. Because there's one message in it that I think this group really needs to hear.

And I would love to know your reaction to this.

This is the only policy proposal I'm making in the book, but I argue that at this point I don't know enough about religion to know what other policy proposals I should make.

And it's the same statement we've already heard today.

Here is my suggestion. I'll explain in a few minutes. It is to educate all children about the world's religions in elementary schools, high schools, public schools, private schools, and home education.

So what I am proposing is that we need to have a curriculum of facts about all religions in the world—history, beliefs, scriptures, music, symbolism, prohibitions, requirements—just as we mandate literacy, math, and American history.

And this should be presented to every child in this country, factually, frankly, without special twists.

And if you teach it, you can teach others what you want.

I think that is the maximum tolerance for religious freedom.

As long as you teach your children about other religions, you can teach them the religion you want them to learn, when and how they want.

But let me know about other religions too.

Now why do I say that?

Because democracy depends on informed citizenship.

Informed consent is the very foundation of our understanding of democracy.

Misinformed consent has no value.

It's like a coin toss. Really, it doesn't count.

Democracy depends on informed consent.

This is how we treat people as responsible adults.

Children under the age of consent are now a special case.

Parents—to use the term Pastor Rick used earlier—are custodians of their children.

they don't own them.

You cannot own your own children.

You have a responsibility to the world, nations, and them to take good care of them.

You can teach them whatever beliefs you think are most important, but I say it is your responsibility to inform them about every other belief in the world.

The reason I did this this time was because I was interested in hearing some reactions to this.

One reviewer for the Roman Catholic newspaper called it "totalitarian."

It seems to me that it is practically libertarian.

Is it totalitarian to require reading, writing and computing?

i don't think so.

All I want to say is facts, facts. No values, just facts about all religions in the world.

Another critic called it "interesting".

Well, the fact that someone might find it funny really bothers me.

To me, this seems such a plausible, natural extension of the democratic principles we already have, that I am shocked to think that some people find it ridiculous.

I know that many religions are keen to keep their children pure in their faith, and try to keep their children from knowing other faiths.

I don't think it can be defended.

However, if there is an answer about it, a reaction to it, I would appreciate it later.

But now I'm going to move on.

Back to cows.

I grabbed this photo from the web, but the person on the left is the really important part of this photo.

That's the butler.

Cows cannot live without human stewards - they are domesticated.

They are a kind of ectosymbiont.

They depend on us to survive.

And Pastor Rick was just talking about sheep.

I will also talk about sheep.

There is a lot of chance convergence here.

How clever of sheep to get a shepherd!

(Laughter) Think about what this did for them.

They can outsource all their problems, such as protecting them from predators, finding food, and so on.

(Laughter) The only cost in most flocks - even this one - is the loss of free breeding.

Oh my God!

“How smart sheep are!” you might say.

Of course, it wasn't sheep smart.

It was never sheep smart.

they were clueless.

Whose smart move?

It was a clever move of natural selection itself.

Jim Watson and DNA structure co-discoverer Francis Crick once joked about what he called the second rule of music boxes.

Leslie Orgel is a molecular biologist and a nice guy. Olger's second rule is "Evolution is smarter than you."

Now, this is not intelligent design. Not by Francis Crick.

Evolution is smarter than you.

If you understand Olger's Second Rule, you'll understand why the intelligent design movement is fundamentally a hoax.

The designs found through the process of natural selection are incredibly vivid.

Biologists are again and again fascinated by the magnificence of what they discover.

But the process itself has no purpose, no foresight, no design.

When I came here four years ago, I told the story of ants climbing a blade of grass.

And the reason the ants did this is because their brains were infected with lancet flukes, which they need to invade the belly of sheep and cows and reproduce.

So, it was a bit of an eerie story.

And I think some people misunderstand.

Lancet flukes are not smart.

I think the intelligence of slug flukes lies somewhere between a petunia and a carrot.

They are not really bright. It doesn't have to be.

The lesson we can learn from this is that we don't have to be conscious of being a beneficiary.

Design exists in nature, but it's not in someone's head.

It doesn't have to be.

That's how evolution works.

Question: Was domestication beneficial for sheep?

That was great for their genetic compatibility.

And here I want to remind you of a great point Paul McCready made at TED three years ago.

Here's what he said: "Ten thousand years ago, in the dawn of agriculture, the human population, including livestock and pets, was about one-tenth of the terrestrial mass of vertebrates."

That was exactly 10,000 years ago.

what are you up to today? Anyone remember what he said to us?

98 percent.

That is what we have done here on Earth.

Well, after talking to Paul, I wanted to get how he calculated this, sources, etc. He also gave me the paper he wrote about this.

Among them, there is a passage that he did not introduce here, and I think it is a very good sentence, so I will read it to you. “For billions of years, chance, in its own realm, has painted the thin shroud of life: complex, improbable, wonderful and fragile.

Suddenly, we humans, a recently emerging species unaffected by the natural checks and balances of nature, have grown to a position of frighteningly powerful population, technology, and intelligence.

We are wielding paintbrushes now. ”

I heard that atmosphere is a thin layer of varnish.

Life itself is just a thin layer of paint on this planet.

And we are the ones who hold the paintbrush.

Culture is the key to our domination of the planet.

And the key to culture is religion.

Suppose a Martian scientist came to Earth.

They will be puzzled by many things.

Anyone know what this is? I will tell you what it is.

This is one million people gathered on the banks of the Ganges in 2001, possibly the largest single gathering in human history, as evidenced by satellite imagery.

There is a large crowd here.

Here is another crowd in Mecca.

They want to know how it came about, why it exists, and how it persists.

Actually, I'm going through this.

Ali is not alone.

For seeds, there are all sorts of great cases. In that case, the parasite would have to get into the mouse and into the cat's belly.

And it will turn the mouse into Mighty Mouse, make it fearless, and fly out into the open where it will be eaten by the cat.

true story.

In other words, we have hijackers. You may have seen the slides from four years ago. It is a parasite that infects the brain and induces even suicidal behavior for reasons other than one's own genetic compatibility.

Can such a thing happen to us?

Yes, that's really great.

"Islam" in Arabic means "obedience".

It means "to surrender one's own desires to the Will of Allah".

But I'm not just talking about Islam.

We also talk about Christianity.

This is a parchment sheet music page I found in a Parisian bookstore 50 years ago.

And there it is written in Latin, "The seed is the word of God, but the sower is Christ."

The word of God is the seed, and the sower is Christ.

Same idea. Well, not quite.

But in fact Christians also...

I will quote a few.

"The center of worship is surrender.

Those who surrender follow God's word, even if it doesn't make sense. ”

These words are by Rick Warren.

These are from "The Purpose Driven Life".

Now, briefly, I would like to talk about the book I read.

You guys have copies too, and I just heard about that person.

And what I want to do now is to say a little bit about the book from a design perspective. Because I think this book is actually a great book.

First and foremost, the goal was to bring purpose to the lives of millions, and he succeeded.

is that a good goal? I think we all agree that it's a great goal in itself.

he is totally right.

Many people have no purpose in life, but bringing purpose to life is a great goal.

I give him an A+ for this.

(Laughter) Did you reach your goal?

yes.

Al Gore, put your mind to it.

(Laughter) Rick is doing exactly what Al is trying to do.

This is a great achievement.

And the means - how does he do it?

This is a masterful redesign of traditional religious themes, updating them, quietly removing obsolete features and giving new interpretations to others.

This is the evolution of a religion that has been going on for thousands of years, and he is only the latest brilliant practitioner of that evolution.

No need to say this. You just heard the man's voice.

Great insight into human psychology, wise advice on each page.

Plus, he invites us to take a peek under the hood.

I really appreciate it.

For example, he has an appendix describing a selection of translations of various Bible verses.

The book is clear, vivid, accessible, and beautifully structured.

That's enough repetition.

It really matters.

Every time you read or say it, another copy is made in your brain.

Every time you read or say it, another copy is made in your brain.

(Laughter) Guys, with me -- (audience and Dan Dennett) Every time you read it or say it, you create another copy in your brain.

And now I come to my problem.

Because I really appreciate everything you said about this book.

But I wish it was better.

The book has some problems.

And it would be dishonest to me not to address those issues.

I wish I could do this in a revised Mark 2 version of his book.

"The truth will set you free."

That's what the Bible says, and I want to live by it.

My problem is that there are some parts in it that I don't think are true.

Now, there is also disagreement on this one.

And that's not my main complaint, it's worth mentioning.

Here's a line -- anyway, it's very similar to what he said: "If God weren't there, we'd all run into each other as a result of astronomical chance in the universe.

You can stop reading this book because life has no purpose, meaning, or importance.

Beyond our short time on Earth there will be no right or wrong or hope. ”

Now I don't believe it.

By the way, it turns out that Homer Groening's film presented a beautiful alternative to just that claim.

We don't need faith in God to be good or meaningful to us.

But, as I said earlier, it's just a difference of opinion.

That's not what I'm really worried about.

How about this. "God designed the environment of this planet for us to live on."

Unfortunately, I think a lot of people take that sentiment to mean that we don't have to do what Al Gore is trying so hard to do to us.

I am not happy with that feeling at all.

And I found the following. “All available evidence in the biological sciences supports the central proposition that the universe is a whole specially designed with life and humanity as its fundamental goal and purpose, and that all aspects of reality have meaning and explanation in this central fact.”

That's Michael Denton. he is a creationist.

At this point, I think, "Wait a minute." I read this again.

After reading it three or four times, I thought, "Is he really an advocate for intelligent design?"

Is he endorsing creationism here? ”

And I don't know.

So I'm like, "Well, I don't know, I still don't know if I want to be mad about this."

However, when I read further, it read: "First, Noah never saw rain, for before the flood God gave him water from the ground."

I wish that sentence wasn't there because I think it's wrong.

And I think people get in the way of scientific understanding when they think about it this way, even though they've only heard about millions of years of Earth's history.

Well, Rick Warren uses scientific terms, scientific facts, and information in a very interesting way.

One of them is, "God deliberately molded and fashioned you to serve Him in a way that makes your ministry unique.

I think it's a lie.

Now, we might want to treat it as a metaphor.

Another example is: "For example, your brain can store 100 trillion facts.

Your mind can process 15,000 decisions per second. ”

Well, it would be interesting to find an interpretation that accepts it.

There may be some way to treat it as true.

“Anthropologists point out that worship is a universal urge, hardwired by God into the very core of our being, and an instinctive desire to connect with God.”

Well, I agree with him, but I think there is an evolutionary explanation.

And what really bothers me about this book is that he seems to argue that if you want to be moral, if you want your life to have meaning, you have to be an intelligent designer, you have to deny evolution by natural selection.

And on the contrary, I believe that taking evolutionary biology seriously is very important for solving the world's problems.

Whose truth are you going to hear?

This is an excerpt from "The Purpose Driven Life". “The Bible must become the authoritative reference in my life. It is the compass I direct, the advice I hear to make wise decisions, and the standard I use to measure everything.”

And here's what bothers me.

Remember I quoted him earlier. "Those who surrender obey God's word, even if they don't understand it."

And that is the problem.

(sighs) "Never argue with the devil.

He's practiced for thousands of years, so he's a better argumenter than you. ”

Now, Rick Warren didn't invent this clever trick.

It's an old move.

It is a very clever adaptation of religion.

This is a wild card to disarm any reasonable criticism.

"Don't you like my interpretation?

Are there any reasonable objections to that?

Don't ask, don't ask!

That's what the devil is talking about. ”

This is what prevents us from having the kind of logical citizenship we want.

I have one more problem, so I'm done.

And if Rick can do it, I'd love to hear back from you.

"In his Great Commission, Jesus said, 'Go to all people of all nations and make them my disciples.

Baptize them in the name of the Father and the Son and the Holy Spirit, and teach them to do all that I have told you.” The Bible says that only Jesus can save the world.

In the last day or so, we've seen a lot of great world maps.

Here's one, but it's not as beautiful as the others. It simply shows the religions of the world.

Here's a sort of current breakdown of the various religions.

Do we really want to devote ourselves to swallowing up all other religions when the scriptures tell us, "Don't listen to what others say, it's just Satan talking!"

Sounds to me like a very problematic ship to be on in the future.

Recently, while driving to Maine, I saw a sign in front of a church that read, "Without God, There Is No Good."

It's kind of cute, isn't it?

A very clever little meme.

I don't believe it, and I think the idea itself, although it's not in this form and generally popular, is one of the main problems we face.

If you're like me, you know many wonderful people who are ardent and active atheists and agnostics who live very good lives without God.

And you also know many religious people who hide behind holiness without doing good deeds.

I just wish this meme would go away.

Thank you for your attention.

(applause)

So I want to talk to you guys about the political chemistry of an oil spill and why it's such an important, long, oily, hot summer, and why we need to avoid distractions.

But before we can talk about political chemistry, we really need to talk about petroleum chemistry.

Here's a picture from when I visited Prudhoe Bay, Alaska in 2002 and saw the Mineral Service testing the ability to burn spilled oil in the ice.

Here you can see a small amount of crude oil, some ice cubes, and two sandwich bags of napalm.

Napalm burns pretty well there.

And the problem is that for us American consumers, oil is really an abstraction.

We are 4 percent of the world's population. We use 25 percent of the world's oil production.

And we can't really understand what oil is until we look at its molecules, and we can't really understand it until we see it burn.

So as that burn progresses, this is what happens.

it takes off. That's a big woosh.

I highly recommend getting the chance to see the crude oil burning sometime. Because you'll never have to listen to political science lectures on the geopolitics of oil again.

It just burns your retinas.

that's right. The retina is baked.

Let's talk a little bit about the chemistry of petroleum.

Oil is a stew of hydrocarbon molecules.

It starts out very small with 1 carbon and 4 hydrogens. That is methane. it just floats.

Then there are all sorts of intermediates with moderate amounts of carbon.

You've probably heard of the benzene ring. They are highly carcinogenic.

And that extends to these big, thick, gorgeous things that have hundreds of carbon, thousands of hydrogen, and vanadium, heavy metals, sulfur, and all kinds of crazy stuff hanging on their sides.

They are called asphaltenes. They are components of asphalt.

Very important in case of an oil spill.

Let's talk a little bit about the chemistry of oil in water.

It's this chemical reaction that makes oil so dire.

Oil does not sink, it floats.

If it sank, it would be a whole different story when it comes to oil spills.

And the other is that it spreads the moment it hits the water.

It spreads very thinly, so it is difficult to enclose it.

What happens next is that the light ends evaporate and some of the toxic substances drift into the water column, killing fish eggs, small fish, etc. and shrimp.

And the asphaltenes, and this is important, are whipped by the waves into a frothy emulsion like mayonnaise.

It triples the amount of oily, dirty gunk in your water, making it very difficult to work with.

It is also very viscous.

When the Prestige sank off the coast of Spain, there was a large cushion about the size of a sofa cushion, made of emulsified oil with the consistency or viscosity of chewing gum.

It is incredibly difficult to clean.

And each oil is different when it comes in contact with water.

When the chemistry of oil and water affects our politics too, it will undoubtedly explode.

For the first time, US consumers will see the oil supply chain in front of them.

They have "Eureka"! It's a moment when suddenly I understand oil in a different context.

So let me tell you a little bit about the origins of these politics. Because it's so important to understand why this summer is so important and why we need to stay focused.

No one wakes up in the morning and thinks, “Wow!

No, they think, "Oh, I have to go buy gas."

i am very angry about it. Oil companies are cheating me.

They set the price, but I don't know.

I am helpless on this matter. ”

And this is what's happening to us with gas pumps - and in fact, gas pumps are specifically designed to diffuse that anger.

You may notice that many gas pumps, including this one, are designed like ATMs.

I spoke with an engineer. It's especially for dispersing our anger. Because we are supposed to have good feelings towards ATMs.

(Laughter) If you look at this, you can see how bad it is.

But in reality, this helplessness arises because most Americans actually feel that oil prices are the result of a conspiracy, not the volatility of world oil markets.

And the problem is also that we feel so helpless about how much we consume, which is somewhat reasonable. In fact, we designed this system because if you want to get a job, having a working car, having a job and keeping a job is far more important than having a GED.

And it's actually very perverted.

Now, there's another quirk about how we buy gasoline. It's just that you're better off doing something else.

This is a BP gas station in downtown Los Angeles.

it is green. Green shrine.

“Well, why would this little thing work for such smart people?” you think.

The reason is that we are very focused on this kind of cognitive dissonance when we buy gasoline.

I mean, we're angry on the one hand and want to be somewhere else.

We don't want to buy oil. We want to do something eco-friendly.

And we kind of get caught in our own scams.

I mean, this is funny, it seems funny here.

But in fact, that's why the slogan "beyond oil" worked.

But this is an essential part of our energy policy and we are not talking about reducing oil use.

Talk about energy independence. Talk about hydrogen cars.

We are talking about biofuels that have not yet been invented.

Cognitive dissonance is therefore part of the way we deal with oil and is crucial in dealing with this oil spill.

Well, oil politics is very moral in the US.

The oil industry is like a giant octopus with engineering, finance and everything else coming together, but we actually look at it from a very moral perspective.

Here's an early photo - as you can see, there were ejecta like this.

Early journalists saw these leaks and said, "This is a filthy industry."

But they also found in it that people are getting rich by doing nothing.

They were not peasants, they only got rich from what came out of the ground.

It's basically "Beverly Hillbillies".

But initially, this was seen as a very morally questionable thing long before it became funny.

And, of course, there was John D. Rockefeller.

And what's important about John D. is that he entered this chaotic wilderness oil industry and streamlined it into a vertically integrated multinational corporation.

It was terrifying. If you think Walmart is a terrible business model today, imagine what this was like in the 1860s and 1870s.

And that is the root of our view of oil as a conspiracy.

But what's really amazing is that journalist Ida Tarbell exposed the Rockefellers in such a big way that they actually enacted an entire antitrust law.

However, in many ways, the image of this conspiracy is still ingrained in us.

One of the things Ida Tarbell said was this--she said, "His nose is as thin as a thorn.

there were no lips.

Underneath the small, colorless eyes was a wrinkled swelling. ”

(Laughter.) Well, the guy is actually still with us.

(Laughter) I mean, it's very pervasive, it's part of our DNA.

And then there's this guy, ok.

So, you might wonder why, after every oil price hike or oil spill, we bring these CEOs to Washington to publicly question and humiliate them.

And this is what we've been doing since 1974, when we first asked them, "Why are there such dastardly interests?"

And we kind of customized the entire oil industry to these CEOs.

And I think we don't look at it on a legal and financial level, but on a moral level.

So I'm not saying they don't have the responsibility to answer the question. My point is that if we focus on whether or not they are a bunch of greedy bastards, we can't really go so far as to change the way they operate or enact laws to actually reduce the amount of oil and reduce our dependence on it.

That's why I say it's kind of a distraction.

But it makes for good theatrics and perhaps, as we saw last week, a powerful catharsis.

So water and oil spills have a very political impact.

So these photos are from the Santa Barbara spill.

I have a picture of this bird.

They really influence people.

When the 1969 Santa Barbara spill occurred, it formed a modern form of the environmental movement.

Earth Day has started.

In addition, the National Environmental Policy Act, the Clean Air Act, and the Clean Water Act were enacted.

All of us come from this era.

I think it's important to look at these bird pictures and understand what happens to us.

we are always here We are standing in front of a petrol pump and we feel helpless.

We see these pictures for the first time to understand our role in this supply chain.

We connect the dots of the supply chain.

And we, as voters, have a kind of "eureka". for a moment.

That is why this oil spill moment is so important.

But it is also very important not to get distracted by theater and its morality.

You really have to get to the root of the problem and work on it.

One of the things that happened with the last two oil spills is that we took some symptoms seriously.

We were very reactive rather than proactive about what happened.

So what we actually did is we paused drilling on the east and west coasts.

We stopped drilling at ANWR, but it didn't actually reduce the amount of oil we consumed.

In fact, it continues to grow.

The only thing that will really reduce the amount of oil we consume is a huge increase in prices.

As you can see, our own production is declining as reservoirs age and are expensive to drill.

World oil reserves are only 2%. 65 percent of them are in the Persian Gulf.

One of the things that has happened to this is that since 1969, there have been thousands of oil spills a year in the country of Nigeria, or in the region that pumps Nigeria's oil, a delta twice the size of Maryland.

So if you import oil from a location that doesn't have strict environmental regulations, you are essentially exporting an oil spill.

This is the equivalent of the Exxon Valdez spill each year since 1969.

And we can't care about spills, because that's what we're looking at here, but really, these guys actually live in war zones.

An area twice the size of Maryland accounts for 1,000 combat deaths a year, all oil-related.

And if they were in America, they might actually be in this room.

They have a degree in political science and a degree in business and are entrepreneurs. They really don't want to do what they do.

And it's kind of another group that pays a price for us.

Another thing we've been doing as we continue to increase demand is play a kind of shell game over cost.

One of the major oil projects in Chad in collaboration with Exxon.

So the US taxpayer paid for it. The World Bank, Exxon paid for it.

we introduced it. There was a tremendous bandit problem.

I was there in 2003.

As I was driving down a dark, dark road, a man in green came out and I thought, "Oh, this is it."

Then a man in an Exxon uniform came out and knew we were all right.

They surround their own private army in the oil fields.

But at the same time, Chad is becoming more volatile, and we're not paying the price at the pump.

We will pay it with taxes on April 15th.

We are doing the same with the price of keeping the Persian Gulf policing and open to sea.

This was in 1988. We actually bombed two Iranian oil platforms this year.

It was the beginning of an escalating US involvement that we will not pay for.

We will pay for it on April 15th, and we can't even calculate the cost of this engagement.

Another place that kind of underpins our increasing dependence on and consumption of oil is the Gulf of Mexico, which was never part of the moratorium.

Now, what's going on in the Gulf of Mexico, as you can see, this is a mineral control chart for gas and oil wells.

It has become such an intense industrial area.

It doesn't resonate with us as much as the Arctic National Wildlife Refuge, but it should be a bird sanctuary.

And for every gasoline you buy in the US, half of it is actually refined along the coast. Because the Gulf has about 50 percent of the US refining capacity and also has many offshore terminals.

So Gulf people are essentially subsidizing the rest of the population through filthy environments.

And finally, American households are also paying for oil.

On the one hand, pumps aren't really that expensive when you consider the actual cost of oil, but on the other hand, the fact that people have no other means of transportation means that they are generally paying large sums of their income just to drive to and from work in fairly battered cars.

If you look at someone who makes $50,000 a year, they have two kids, three or more jobs, and they really have to commute.

In fact, they spend more on cars and fuel than they do on taxes and medical bills.

And the same thing happens at the 50th percentile, about 80,000.

The cost of gasoline is a huge burden on the American economy, but it is also a burden on individual households, and it's kind of scary to think about what happens when prices go up.

So what I'm about to tell you is what you have to do this time.

What is the law? What must I do to stay focused?

One thing I can say is that we need to leave the theater.

We need to move away from the moratorium.

We need to refocus on molecules.

A pause is fine, but we need to focus on the molecules on the oil.

One thing we have to do is try not to fool ourselves into thinking we can have a greener world before we use less oil.

We need to focus on oil reduction.

Above is a schematic diagram of how oil is used in the US economy.

It comes in from the side. The useful is dark grey, and the useless, or what is called rejected energy, or waste, is on top.

It turns out that the waste far exceeds the amount that is actually useful.

And one of the things we need to do is not just make vehicles more fuel efficient and significantly more efficient, but we need to improve the economy in general.

We need to remove perverted incentives to use more fuel.

For example, a person who drives 20,000 miles a year has an insurance plan that pays the same amount as someone who drives 3,000 miles.

In fact, we encourage people to drive more.

We have policies that reward sprawl -- we have all kinds of policies.

We need more mobility options.

Gas prices should better reflect the actual cost of oil.

And at least $10 billion in annual subsidies from the oil industry need to be redirected to help middle-class people find better ways to commute.

Whether it's developing more efficient cars or building markets for new cars and new fuels in the future, this is where we need to work.

This whole thing needs to be streamlined. Learn more about this policy here.

It's called STRONG, which means 'gradually reducing demand for oil with safe transportation', and the idea is that we need to be stronger, not weaker.

It's up on NewAmerica.net.

The important thing about these things is to go from feeling helpless at the pump to actually being active and thinking seriously about who you are, trying to have those special moments where the pump actually connects the dots.

Today, the oil tax is seen as the third rail of US politics, the no-fly zone.

In fact, I agree that $1 a gallon of oil is probably too expensive, but starting at 3 cents a gallon of gasoline this year, 6 cents next year, 9 cents the next year, and up to 30 cents by 2020 would actually cut gasoline consumption significantly, while giving people time to prepare and respond, while raising money and raising awareness.

Let me explain a bit how this works.

This is, hypothetically, a year's worth of gasoline receipts.

The first tax levied is the tax levied for a stronger America. 33 cents.

So you are not helpless with the pump.

The second is a kind of warning sign, much like the one on a cigarette packet.

And it says, "The National Academy of Sciences estimates that every gallon of gasoline you burn in your car costs you 29 cents in medical costs."

It's a lot.

Now you know you're paying far less in taxes than you pay for medical care.

And also, I hope you start connecting with the whole larger system.

And at the same time, I have a number that I can call to get the information I need to actually reduce my petrol addiction, whether it's a commute or a low-interest loan for another type of car.

With this set of policies, we could actually reduce our gasoline consumption, or oil consumption, by 20% by 2020.

That is 3 million barrels per day.

But to do this, one of the things we really have to do is remember that we are hydrocarbon people.

We need to be mindful of the numerator and not get distracted by the theater or the cognitive dissonance of the green possibilities out there.

We need to sit back and do the hard work of reducing our dependence on fuel and molecules.

thank you.

(applause)

I would like to introduce my bad friend.

Meet Thelma and Louise.

(laughs) I love cows.

Methane emissions and climate change have taken a toll on them lately, but I hope I can help restore some of their reputation by showing how incredibly important they are in solving one of the world's biggest problems: food security.

But more important for Africa is the resulting childhood stunting.

Nutritional inhibition manifests itself as a reduction in growth rate in human development.

And according to UNICEF, stunting is not easy.

This happens over a long period of time in which the child endures a painful and debilitating cycle of illness, loss of appetite, inadequate nutrition and inadequate care.

And most children can't stand that kind of rigor.

Surviving individuals, however, inherit long-term cognitive deficits as well as reduced stature.

The number of stunted children under the age of five is declining in most parts of the world.

I hate to say this, but the only place they haven't declined is here in Africa.

Here, 59 million children, 3 in 10 in that age group, struggle to reach their full genetic potential—hereditary potential.

Protein is one of our most important dietary requirements, and evidence shows that a lack of the essential amino acids, the building blocks of protein, in infant diets can cause stunting.

Essential amino acids are called essential because they cannot be synthesized by our body.

We need to get them from food and the best sources are animal sources such as milk, meat and eggs.

Most of the protein consumed on the African continent comes from crops.

And while millions of smallholder farmers raise animals, livestock production is not as easy as we think.

The large disparity in livestock between rich and poor countries is due to poor animal health.

Endemic livestock diseases, some of which are transmissible to humans, threaten not only livestock producers in these poor countries, but overall human health everywhere.

This is a global pathogen network.

Shows pathogens found worldwide, based on the Expanded Infectious Diseases Database.

and indicate pathogens that share a host.

In a nutshell, we share pathogens, and therefore diseases, with our closest relatives, domestic animals.

And we call these zoonotic diseases.

According to recent reports, dozens of deadly zoonotic diseases kill 2.2 million people and sicken 2.4 billion people each year.

And Jimmy says, "The biggest burden of zoonotic diseases falls on the billion poor livestock keepers."

We completely underestimate the importance of small farmers.

We are beginning to realize how important they are and how they affect our medical health, biological safety, and more recently, our cognitive and physical health.

They are at the forefront of zoonotic epidemics.

They almost support our existence.

And they know very little about disease prevention and treatment in livestock, even though they need to know a lot.

So how do they learn?

Apart from experience sharing and trial and error, traditional agricultural extension services are ground-based and wireless, costly and difficult to scale in the face of population growth.

It's a pretty dark story.

But we are at an interesting point in Africa.

We are changing that story with innovative solutions powered by scalable technology.

Knowledge doesn't have to be expensive.

My company has developed an agriculture platform called iCow.

We use SMS on a simple low-end phone to educate farmers on best practices for their livestock.

Farmers receive 3 SMSs per week on livestock best practices, and farmers who implement the messages see productivity gains in as little as 3 months.

The first productivity gain, of course, is improved animal health.

Use SMS because SMS is retentive.

The farmer saves the message and writes it down in a book. In fact, we are instilling agricultural manuals into the fields.

We recognize that we are all part of the global food network – producers and consumers, you and me and all farmers.

We are now focused on bringing producers and consumers together to take action and take responsibility not only for food safety, but food safety as well.

This beautiful animal is a cross between the Afro-Asian Sahiwal and the Dutch Fleckvie.

She has better milk than Sahiwal's mother and is tougher and more resistant to disease than Fleckvie's father.

In Ethiopia and Tanzania, the African Dairy Genetic Gain Program uses SMS and state-of-the-art genomics to pioneer Africa's first tropical adapted dairy breeding center and dairy performance documentation center.

Farmers provide production data such as milking records, breeding records and feeding records to the ADGG platform.

This stage is synthesized through algorithms of the world's top livestock institutes before reaching farmers as a working SMS.

Customized data, customized responses are all aimed at improving productivity based on field possibilities.

We are in a very interesting situation in African agriculture.

By the end of this year, there will be almost 1 billion mobile phone subscriptions.

We have the power to ensure that livestock production systems are not only healthy, productive and profitable, but that farmers are knowledgeable and, more importantly, they are safe.

Working with smallholder farmers is one of the best ways to ensure food security.

Working with small farmers is one of the best ways to ensure every child has the opportunity and ability to reach their full genetic potential.

And with the help of millions of smallholder farmers and bad cows like me, we should be able to stop stunting in Africa.

thank you.

(Applause.) Thank you.

So, while I have a job in marketing that I love, my first passion was physics. This was a passion brought to me by a wonderful schoolteacher when my hair was a little less gray.

There he told me that physics is great because it teaches us a lot about the world around us.

I'm going to spend the next few minutes trying to convince you that physics can teach you something about marketing.

Let's raise our hands -- did anyone study marketing in college?

Who studied physics in college?

pretty good. And at school?

Well, many of you.

So hopefully this brings back some happy memories, or perhaps some slightly unsettling memories.

physics and marketing.

Let's start with something very simple. Newton's Law: "Force equals mass times acceleration".

This is probably something Turkish Airlines should have considered a little more carefully before running this campaign.

(Laughter) But a quick rearrangement of this equation is that the acceleration and the force to mass are equal. This means that the larger the particle, and thus the more mass it has, the more force is required to change its direction.

The same is true for brands, the bigger the brand, the more baggage it carries, and the more power it takes to change its positioning.

And that's one of the reasons why Arthur Andersen chose to start Accenture rather than trying to convince the world that Andersen could represent something other than accounting.

This explains why Hoover found it so hard to convince the world that it was more than a vacuum cleaner, and why companies like Unilever and P&G keep their brands separate like Ariel, Pringles and Dove rather than having one giant parent brand.

Therefore, in physics, the more mass an object has, the more force is required to change its direction.

In marketing, the bigger the brand, the harder it is to reposition it.

So think about a portfolio of brands, or a new brand for a new business.

Now, does anyone remember Heisenberg's Uncertainty Principle?

From here it gets a little more technical.

This means that, by definition, it is impossible to accurately measure the state of a particle, that is, its position and momentum. Because the act of measuring a particle, by definition, changes it.

To explain it, you have an elementary particle, and you shine light on it, and you don't know where it was before you saw it, because the photon of light has momentum, which makes the particle collide.

By measuring it, the act of measuring changes it.

The act of observation changes that.

It's the same with marketing.

Therefore, the act of observing consumers changes their behavior.

Consider a group of mothers talking about their amazing children in a focus group. Few mothers buy junk food in bulk.

Nonetheless, McDonald's sells hundreds of millions of burgers each year.

Think of the people who are co-selling in supermarkets. They stock wagons full of fresh green vegetables and fruits, but other days they don't do that kind of shopping.

And when you consider how many people in the survey claim to search for porn on the web regularly, that's a very small number.

But we know that this category is the most searched category on Google.

Luckily, science, no, sorry, marketing is getting easier.

Fortunately, now with better point-of-sale tracking and increased consumption of digital media, we can measure more of what consumers actually do rather than what they say.

Therefore, in physics, it is never possible to measure particles precisely and accurately, because observations change them.

Marketing—marketing messaging—is about measuring what consumers actually do, not what they say they will do or expect them to do.

Second, the scientific method, or physics, an axiom of all sciences, says that observation cannot prove a hypothesis, it can only disprove it.

What this means is that we can gather more data based on a hypothesis or positioning, and we can strengthen it, but we cannot prove it conclusively.

And just one conflicting data point can ruin a theory.

Ptolemy, for example, had dozens of data points to support his theory that planets revolve around the Earth.

It took only one solid observation of Copernicus to blow the thought away.

And marketing has a similar point. You can invest in a brand for the long term, but just one counter-observation of its positioning can destroy consumer beliefs.

Let's take the example of BP. They've spent millions of pounds over the years building their reputation as an eco-friendly brand, but then a small mishap happened.

Consider Toyota.

Long revered as one of the most reliable cars in the world, it was hit by a massive recall.

And Tiger Woods has long been the perfect brand ambassador.

Well, you know the story.

(Laughter) In physics, hypotheses cannot be proven, but they are easy to disprove. Any hypothesis is unstable.

And marketing says that no matter how much you've invested in your brand, a bad week can ruin decades of good work.

Therefore, be very careful to avoid mistakes that can damage your brand.

And finally, the slightly obscure world of entropy, the second law of thermodynamics.

This shows that the entropy, a measure of the system's disorder, always increases.

The same goes for marketing.

Twenty years ago, a single message, controlled largely by a single marketing manager, could pretty much define a brand.

But where we are today, things are changing.

You can take a strong brand image or message and put it out there, much like the Conservatives did with their election posters earlier this year.

But then you lose control of it.

With the digital comment creation and distribution tools currently available to all consumers, it is impossible to control where comments are sent.

Your brand will start to disperse (laughs) and become more chaotic.

(Laughter) It's out of your control.

(Laughter) I actually saw him speak and he did a good job.

But while this may be unnerving for marketers, it's actually a good thing.

This distribution of brand energy brings the brand closer to people and makes them more immersive.

This distribution of energy is a democratizing force that ultimately benefits brands.

So the lesson from physics is that entropy always increases. It's a basic law.

The message in marketing is that brands will become more distributed.

You can't fight it, so embrace it and find a way to deal with it.

Finally, my teacher, Mr. Wutter, told me that physics was great. I hope you have convinced me that physics, even in the world of marketing, teaches us all something special.

thank you.

(applause)

Martin Luther King Jr. didn't say "have a nightmare" when he inspired the civil rights movement.

"I have a dream," he said.

And I have a dream

I have dreams that I can stop thinking the future will be a nightmare, but this is going to be difficult. Because if you think about any recent blockbuster movie, almost all of its visions of humanity are apocalyptic.

I think this movie is "The Road", one of the hardest watches of our time.

This is beautiful filmmaking, but everything is run down and everything is dead.

And just a father and son walking down the road trying to survive.

And I believe that the environmental movement, which I am part of, is contributing to the creation of this vision of the future.

For too long, we've been propagating nightmarish visions of what's to come.

We've focused on worst-case scenarios.

We have focused on the problem.

And I haven't thought enough about that solution.

We've used fear to get people's attention, so to speak.

And any psychologist will tell you that fear in organisms has to do with escape mechanisms.

This is part of the fight-or-flight mechanism, and when an animal is frightened, think of a deer.

The deer is very still and about to run away.

And I think that's what we do when we ask people to join our agenda on environmental degradation and climate change.

People are freezing and fleeing because we use fear.

And I think the environmental movement has to grow up and start thinking about what progress is.

What does it feel like to improve human destiny?

And I think one of the problems we're facing is that the only people who are cornering the market in terms of progress are those who have a financial definition of what progress is, an economic definition of what progress is. Whether it's the stock market, or GDP or economic growth, somehow if the right numbers go up, our lives will get better, somehow our lives will get better.

Somehow this appeals to human greed rather than fear. In other words, more is better.

come. In the Western world, enough is enough.

We have had enough, although in some parts of the world this may not be the case.

And we have long known that this is not a good measure of national happiness.

Indeed, in the 1930s, Simon Kuznets, the designer of the national accounting system, said, "The welfare of a nation can hardly be inferred from its national income."

But we have built a national accounting system firmly based on production and production of goods.

And sure, this is probably historical and had its time.

In World War II we had to produce a lot.

And in fact, we had to destroy a lot of Europe, and then rebuild Europe, because we succeeded in producing some kind of product.

So our national accounting system has come to stick with what we can produce.

But as early as 1968, this visionary man, Robert Kennedy, at the start of his ill-fated presidential campaign, delivered the most eloquent dismantling of gross national product ever.

He ended his speech with the words, "Gross National Product measures everything but what makes life worthwhile."

how crazy is that? Does it mean that our measure of progress, the dominant measure of progress in society, measures everything but what makes life worthwhile?

If Kennedy were alive today, I believe he would have asked a statistician like me to go find out what makes life worth living.

He would ask us to redesign our national accounting system based on important things like social justice, sustainability and people's well-being.

And indeed, social scientists are already traveling around the world asking these questions.

This is according to a global survey.

It's asking people what they want.

And rightly so, people all over the world say they want well-being for themselves, their families, their children and their communities.

Well, they think money matters a little.

It's there, but it's not as important as happiness, it's not as important as love.

We all need to love and be loved in life.

It's not as important as health.

We want to live a healthy and fulfilling life.

These seem to be natural human desires.

Why don't statisticians measure these?

Why don't we think of national progress in terms of this rather than how much we have?

And actually, this is what I've been doing all my adult life. It's about how we measure happiness, how we measure happiness, how we can do it within the confines of our environment.

And at the organization I work for called the New Economics Foundation, we believe people should be happy and so should the planet, so we created something called the Happy Planet Index.

Why not create a progress scale to show it?

And what we do is that the ultimate outcome of a nation is how successful it is in creating happy and healthy lives for its citizens.

That should be the goal of every nation on earth.

But we have to remember that it has a fundamental input and that is the amount of the earth's resources that we use.

We all have one Earth. we all need to share it.

It is the ultimate scarce resource and the only planet we share.

And economics is very interested in scarcity.

If you want to turn scarce resources into desired outcomes, think in terms of efficiency.

Think in terms of how much return you can get on your investment.

And this is a measure of how much happiness we can get from using the earth's resources.

It's an efficiency measure.

Probably the easiest way to show it is with this graph.

Running horizontally along the graph is the 'ecological footprint', a measure of how much resources we use and how much pressure we put on the planet.

Any more than that is no good.

Running vertically upwards is a measure called "happiness life expectancy."

It is about national welfare.

It's like happiness-adjusted life expectancy.

It's like the quality and quantity of life in a nation.

The yellow dot there is the global average.

There are now a huge number of countries around that global average.

At the top right of the graph are countries that are doing reasonably well, creating happiness, but using a lot of Earth to get there.

Those are the United States, other Western countries across those triangles, and some Gulf countries that are actually there.

Conversely, at the bottom left of the graph are countries that produce less well-being, typically sub-Saharan Africa.

Life there, in Hobbes's words, is short and cruel.

Life expectancy in many of these countries is only 40 years.

Malaria and HIV/AIDS kill many people in these parts of the world.

Well, good news!

Several countries, indicated by yellow triangles, are performing better than the global average, rising towards the top left of the graph.

This is the wish graph.

We want to be top left where the good life doesn't come at the expense of the planet.

they are latin americans.

The country at the top is a place I have never been to.

Maybe some people think so.

Costa Rica.

Costa Rica -- Life expectancy is 78.5 years.

It's longer than America.

They are the happiest people on the planet, and the happiest of all, according to the latest Gallup World Poll. More than Switzerland or Denmark.

They are the happiest places.

They're doing it with a quarter of the resources normally used in the West, a quarter of the resources.

What is going on there?

What is going on in Costa Rica?

Let's look at some of the data.

99% of electricity comes from renewable sources.

Their government is one of the first countries to commit to becoming carbon neutral by 2021.

They abolished the army in 1949--1949.

And they invested in social programs like health and education.

They have the highest literacy rates in Latin America and the world.

It also has a Latin atmosphere, doesn't it?

they have social connections.

(Laughter) The challenge, perhaps, and we have to think about it, is that the future may not be North America, it may not be Western Europe.

It may be Latin American.

And the real challenge is to get the global average up to this point.

that is what we must do.

If you're going to do that, you'll need to pull the country from the bottom of the graph, and you'll also need to pull the country from the right side of the graph.

And we are starting to create a happier planet.

That's one way of looking at it.

Another way to look at it is to observe trends over time.

We don't have good data retroactively for every country in the world, but we do have some of the richest countries, the OECD group.

This is the trend of happiness over the period, a slight increase, but this is the trend of environmental load.

As a result, the strict Happy Planet methodology is less efficient at transforming ultimately scarce resources into the results we want.

And what really matters is that probably everyone in this room wants society to get to 2050 without apocalypse happening.

It's actually not that far off.

That's half the distance of a human lifetime.

A child entering school today will be my age in 2050.

This is not too far in the future.

It shows the UK government's targets for carbon and greenhouse gas emissions.

Mind you, this is not normal business.

It's changing our business.

It's changing the way we organize, implement government policies, and live our lives.

And most importantly, we need to continue to improve our well-being.

No one says that going to the polls will reduce your quality of life.

None of us want to stop human progress.

We want to keep doing that.

I hope that the human race will continue to grow.

And I think this is where climate change skeptics and deniers come in.

I think this is what they want. They want their quality of life to continue to improve.

They want to hold on to what they have.

And I think that's what we have to do if we're going to get involved with them.

This means that we need to be even more efficient.

It's very easy to draw graphs and such, but the point is that these curves need to be changed.

I think we can get out of system theory here. Systems engineers create feedback loops to provide the right information at the right time.

Humans are very inspired by the "now".

With a smart meter installed in your home, you will know how much electricity you are currently using and how much your electricity bill will cost, and your children will walk around and turn it off in no time.

What does it look like for society?

The reason is that I listen to the FTSE 100, the Dow Jones, and the dollar-pound ratio on the radio news every night, but I don't even know which way the dollar-pound ratio should tilt for good news.

And why would I ask such a thing?

Why don't we ask how much energy Britain used yesterday, or how much energy America used yesterday?

Did we hit our 3% annual target for reducing our carbon footprint?

That's how we set collective goals.

Publish it to the media and start thinking about it.

And you need a positive feedback loop to increase your happiness. At the government level, we might produce national accounts of happiness.

At the business level, you might focus on employee well-being. This is actually associated with creativity, and we know it is associated with innovation. Many innovations will be needed to address these environmental issues.

These nudges are necessary on a personal level as well.

You may not need a lot of data, but you do need reminders.

In the UK, there is a strong public health message of 5 fruits and vegetables a day and how much exercise you should do, but this is by no means the best thing for me.

What is happiness?

What are 5 things you should do every day to be happier?

We did a project a few years ago for the Government Office of Science. The large program, called the Foresight program, involved many people, many experts, all evidence-based, and a huge book.

But what we did was, what are five positive actions you can take to improve your well-being in life?

And the important thing about these things is that they're not exactly the secret to happiness, but they're what I think happiness flows from the side.

The first is connection, and social relationships are the most important foundation of life.

Can you invest time and energy with loved ones?

keep building them.

The second is active.

The quickest way to get out of a bad mood is to go outside, go for a walk, turn on the radio and dance.

Being active is great for keeping us in a positive mood.

The third is "noticing".

How aware are you of what is happening in the world, the changing seasons, and the people around you?

Are you aware of what is welling up within you and about to emerge?

Mindfulness, cognitive-behavioral therapy is based on a lot of evidence and is [extremely] powerful for our health.

Fourth, it's important to keep learning and keep going. In other words, lifelong learning.

Older people who keep learning and are curious have far better health outcomes than those who start to shut down.

But it doesn't have to be formal learning. It is not knowledge-based.

It's more of a curiosity.

It could be learning how to cook a new dish or picking up an instrument you forgot about as a kid.

keep learning.

And the last one, and the most anti-economic activity, is making donations.

Our generosity, altruism, and compassion are all hardwired into reward mechanisms in our brains.

Giving makes you feel better.

You can do an experiment where you give two groups of people $100 in the morning.

You tell one of them to use it for himself and the other to use it for others.

When we measure their happiness at the end of the day, people who spend money on others are much happier than those who spend money on themselves.

And I don't think these 5 methods on this handy postcard should cost the planet.

No carbon content.

They don't need many items to be satisfied.

So I think it's quite possible that happiness doesn't cost the planet.

Well, Martin Luther King, Jr. gave an amazing speech on the eve of his death.

"I know there are challenges ahead, and there may be challenges ahead, but I'm not afraid of anyone. I don't care," he said.

I have been to the top of the mountain and have seen the promised land. ”

He was a preacher, but I believe that the environmental movement, and indeed the business community and governments, need to climb a mountaintop, need to look out, need to see the promised land, the promised land, and have a vision of the world we all want.

Not only that, but you have to make a big shift to get there, and you have to pave that big shift with good stuff.

Humans want to be happy.

Pave them in 5 ways.

And we need signposts like the Happy Planet Index to bring people together and point them to it.

Then I believe we can all create the world we all want, where happiness doesn't come at the expense of the planet.

(applause)

We live on a human-dominated planet that is putting unprecedented pressure on our planetary systems.

This is bad news, but surprisingly, it's also part of the good news.

We are the first generation to be informed that, thanks to science, we may be undermining the stability of the planet and its ability to support human development as we know it.

The global risks we face are so great that business as usual is not an option. This is also good news.

In fact, we are at a stage where transformational change is needed, which opens the door for innovation, new ideas and new paradigms.

This is a scientific journey on the challenges facing humanity in the global stage of sustainability.

On this journey, I would like to bring with me a good friend, a stakeholder, who is always absent from the negotiations on environmental issues, but an uncompromising stakeholder: the planet.

So I thought I'd bring her on stage today and witness her as a witness to an amazing journey, a humble reminder of the Age of Grace we've lived through over the last ten thousand years.

This is how life has been on Earth for the last 100,000 years.

This is a very important period. This is roughly half the time we have been fully modern humans on Earth.

We had about the same ability that developed civilization.

These are the environmental conditions on Earth.

Here we use temperature variation as a proxy.

It felt like a jumping ride. A crisis 80,000 years ago saw us leave Africa, another crisis 60,000 years ago colonized Australia, another crisis 40,000 years ago left Asia for Europe, and then we entered a surprisingly stable Holocene epoch. The Holocene is, as far as we know, the only period in Earth's entire history that could support human development.

1000 years into this era, we abandon our hunting and gathering habits.

We've grown from millions to 7 billion today.

Mesopotamian Culture: We invented agriculture and domesticated plants and animals.

There are Romans, Greeks, and stories you know.

As far as we know, it's the only stage that can support humanity.

The problem is we're putting a 4x squeeze on this poor planet. A quadruple squeeze, as that first squeeze, of course, increases population.

Now, it's not just about numbers. This is not just the fact that we are 7 billion people contributing to 9 billion people, but it is also a matter of equity.

Most of the environmental impact on Earth is caused by the wealthy 20 percent who jumped on the industrial bandwagon in the mid-18th century.

The majority of the planet wants and has the right to development, but they generally want an unsustainable lifestyle, which puts a lot of pressure on them.

The second pressure on the planet, of course, is the climate change challenge, the big problem. The scientific policy interpretation is that stabilizing greenhouse gases at 450ppm is sufficient to avoid an average temperature above 2°C, avoiding the risk of destabilization of the 6m West Antarctic Ice Sheet (level rise) and the risk of destabilization of the 7m Greenland Ice Sheet (sea level rise).

Now, you would have hoped that the pressures of climate change would hit a strong Earth, a resilient planet, but unfortunately the third pressure is ecological decline.

Never before in the last 50 years have we seen a more rapid decline in ecosystem functioning and ecosystem services on Earth. One is the long-term ability to adjust climate in forests, land and biodiversity.

The fourth pressure is surprise, the concept and evidence that we need to abandon the old paradigm. That is, the concept and evidence that ecosystems behave linearly, predictably, and controllably within our, so to speak, linear systems, and indeed that surprise is universal, as systems tip over so rapidly, abruptly, and often irreversibly.

Dear Ones, this brings a significant amount of human pressure on Earth.

In fact, we may have entered a new geological epoch, the Anthropocene, in which humans are the main drivers of change at the planetary level.

Now, as a scientist, what is the evidence for this?

Unfortunately, the evidence is ample.

Carbon dioxide isn't the only thing driving change in hockey sticks.

Nitrous oxides, methane, deforestation, land degradation from overexploitation, species decline, and virtually any other parameter important to human well-being can be taken, all showing the same pattern over the past 200 years.

At the same time, they diverge in the mid-50s, ten years after the Second World War, and show very clearly that the great acceleration of human undertakings begins in the mid-50s.

For the first time, we can see the impact on a global level.

And I can tell you, when you start doing professional research on each of these things, you discover something very important. It is the conclusion that we may have reached the point where we have to bend the curve, we may have entered the most challenging and exciting decade in human history on Earth, the decade where the curve has to be bent.

Now, as if it weren't enough to bend the curve and understand the accelerating pressure on the Earth, we also need to recognize the fact that the system has multiple stable states separated by thresholds. Shown in this ball and cup diagram. The depth of the cup is the resilience of the system.

Currently, the system may gradually lose cup depth and resilience under the pressures of climate change, erosion and biodiversity loss, appearing seemingly healthy only to abruptly tip over when below a threshold. Upf.

sorry. Conditions change, and literally new biophysical logic takes over, new species take over, and the system locks up in an undesirable situation.

Do you have evidence of this? Yes, the coral reef system.

A biodiverse, low-nutrient hard coral system under multiple pressures, including overfishing, unsustainable tourism, and climate change.

Something triggers a system to tip over, lose its resilience, take over soft corals, and create an undesirable system that is unable to support economic and social development.

The Arctic – a beautiful system – a coordinated biome on a planetary level that seems to be in good shape despite the ever-increasing effects of climate change.

No scientist could have predicted in 2007 that something could suddenly cross the threshold.

Quite surprisingly, the system suddenly loses 30-40 percent of its summer ice.

And, of course, there's the drama that logic can change when the system does this.

It changes color, absorbs more energy, and can lock your system in an undesirable state as it can get stuck.

In my mind, it's the biggest red flag warning that humanity is in danger.

As an aside, you know that the only red flag that surfaced here was a submarine from an unnamed country that raised a red flag on the Arctic seafloor to control its oil resources.

Now, if there is any evidence that wetlands, forests, [obscure] monsoon systems and rainforests behave in this non-linear fashion, that is what we have now.

About 30 scientists from all over the world gathered and asked the first question, "Should we put the earth in a pot?"

So we have to ask ourselves. Are we threatening this unusually stable Holocene state?

In fact, are we putting ourselves too close to thresholds that are detrimental to human development and are highly undesirable, or now potentially catastrophic?

You don't want to stand there.

In fact, you are not even allowed to stand where this gentleman stands, on the bubbly, slippery waters of the entrance.

In fact, well above this threshold there is a fence beyond which the danger zone is reached.

And this is the new paradigm we put together a couple of years ago, recognizing that the old paradigm of just analyzing parameters and predicting into the future with the goal of minimizing environmental impact is a thing of the past.

Well, we ask ourselves. Which large-scale environmental processes will we have to become stewards of to keep ourselves safe in the Holocene?

And, thanks to major advances in Earth system science, can we even identify the threshold at which nonlinear change is expected—the threshold?

And is it possible to define planetary boundaries, or fences, within which humans can safely operate?

The study, published in the journal Nature in late 2009, took years of analysis to come to the conclusive proposition that only nine planetary boundaries could be found that could provide safe working space under active management.

Of course, these also include the climate.

You might be surprised to learn that it's not just the climate.

However, this indicates that among many systems on Earth, we are interconnected with three large systems: climate change, stratospheric ozone depletion, and ocean acidification, for which large-scale threshold scientific evidence exists in the paleorecord of Earth's history.

But it also includes what we call “slow variables,” the systems that internally regulate and buffer the Earth’s capacity for resilience: interference with the great cycles of nitrogen and phosphorus on Earth, land-use change, rates of biodiversity loss, freshwater use, the ability to regulate global biomass, carbon sequestration, and diversity.

And there are two parameters that could not be quantified. It's chemical pollution, as well as air pollution, including sulfates and nitrates that cause greenhouse gases and air pollution.

Together they form an integrated whole to guide the development of Anthropocene humans, understanding that the Earth is a complex self-regulating system.

In fact, most evidence indicates that the nine could act as the Three Musketeers, "one for all, all for one."

It degrades forests, crosses terrestrial boundaries, and undermines the ability of the climate system to remain stable.

In fact, the drama here is that the challenge of climate change may prove to be an easy one when considering the whole agenda of sustainable development.

Now, this amounts to the big bang of human development within the safe operating areas of the planetary boundaries.

Indicated here by the black line is the safe operating region, or quantified boundary, as suggested by this analysis.

The yellow dot in the middle here is our starting point, pre-industrial time, and we are very safely in the safe operating area.

In the 50's we start expanding our business.

Already in the 60s, through the Green Revolution and the Haber-Bosch process of fixing nitrogen from the atmosphere, as you know, today mankind extracts more nitrogen from the atmosphere than the entire biosphere naturally emits.

It's not until the early 90's, actually just after Rio, that we cross the climatic boundary.

And today we are at a situation where we are estimated to have crossed the three limits of the rate of biodiversity loss. This is the sixth extinction period in human history, one of which is the extinction of the dinosaurs. Nitrogen and climate change.

But while we still have some degree of freedom in other parts, we are rapidly approaching it in land, water, phosphorus and oceans.

But it guides mankind and gives us a new paradigm to shine a light on previously overwhelming industrial vehicles that function as if they were just driving down a dark, straight highway.

Now the question is, how depressing is this?

So is sustainable development a utopia?

Well, there is nothing that can be suggested scientifically.

In fact, there is enough science to show that we are capable of making this transformational change, and that we have the capacity to move beyond scale into new, revolutionary, transformational gears.

The drama, of course, is that 200 countries on Earth must start moving in the same direction at the same time.

But it fundamentally changes our governance and management paradigm, moving away from our current linear command-and-control mindset toward a more flexible and more adaptive approach to efficiency and optimization, recognizing that redundancy in both social and environmental systems is key to being able to cope in times of turbulent global change.

We must invest in sustainability, the ability of social systems and ecosystems to withstand shocks and stay in the desired cup.

We need to invest in our transformative ability to move from crisis to innovation, and our ability to bounce back after a crisis and, of course, our ability to adapt to inevitable change.

This is a new paradigm.

We do not do that on any scale when it comes to governance.

But where is it going?

Are there successful examples of applying this mind shift at the local level?

Well yes it does and the list can get longer and longer.

For example, here's the good news. In Latin America, the plow-based farming system of the 50s and 60s essentially led agriculture to a dead end, with increasingly low yields, organic matter degradation, and fundamental problems with livelihoods in many countries of Paraguay, Uruguay, and Brazil. He worked with scientists to bring innovation and entrepreneurship among farmers, leading to an agricultural revolution that combined no-till systems with multi-farming using locally adapted technology. Some countries have significantly increased the area under mulching for zero-til farming, which not only produces more food but also sequesters carbon.

The Australian Great Barrier Reef is another success story.

Tourists, fishermen, the Australian Great Barrier Reef Management Authority and scientists recognize that the Great Barrier Reef is doomed under its current system of governance.

Global change, shelf beautification culture, overfishing and unsustainable tourism all collectively threaten this system.

But the window of opportunity was innovation and new thinking. Today, that has led to a whole new governance strategy of building resilience, acknowledging redundancy, investing in the entire system as an integrated whole, and making the system even more redundant.

There are other examples in my country of origin, Sweden, where, like many countries, the swamps of southern Sweden were considered flood-prone, polluted and nuisances in peri-urban areas.

But again, the crisis, new partnerships are working locally to turn these into key elements of sustainable urban planning.

In other words, crisis leads to opportunity.

So what does the future hold?

Of course, there is one big challenge in the future: feeding a world of 9 billion people.

All we need is a new green revolution. The Earth's boundaries indicate that agriculture must become a sink rather than a source of greenhouse gases.

You basically have to do this on your current land.

It cannot be extended any further as the planetary boundaries will be eroded.

Twenty-five percent of the world's rivers don't even reach the ocean, so we can't continue to consume water the way we do today.

And change is needed.

Interestingly, for example, based on my and other studies in Africa, I have shown that even the most vulnerable small-scale rain farming systems can triple and quadruple yield levels on current lands through drought-to-drought bridging innovations and supplemental irrigation, sustainable sanitation systems that close the loop of nutrients from the toilet back to the farmer's field, and innovations in cultivation systems.

The latest Nobel laureate in economics, Elinor Ostrom, has demonstrated empirically around the world that we can govern the large global commons, by investing in trust, local action-based partnerships, and institutional innovation beyond scale, that local actors can work together to address the global commons.

But even in the area of ​​hard policies, we are innovating.

We know we must move from fossil reliance to a low-carbon economy in record time.

So what shall we do?

Everyone talks about a carbon tax, but it doesn't work. Emissions planning, for example, one of the policy instruments, feed-in tariffs for energy systems, has already been applied, with China introducing it to offshore wind power systems and all the way to the United States.

We offer guaranteed prices for investments in renewable energy, but we can also subsidize electricity for the poor.

You lift people out of poverty.

Solving climate issues for the energy sector while at the same time fostering innovation. This is an example of something that can scale quickly at the global level.

So there is – definitely – an opportunity here, and so many examples of transformational opportunities on Earth can be enumerated.

The key to all of this, the red thread, is a mindset shift, moving away from situations that are simply driving us into a bleak future, and instead backcasting our future and asking, "What is the playing field on Earth?"

What are the planetary boundaries where we can safely operate? ”

And in doing so, we backtrack innovation.

But of course, this drama clearly shows that incremental change is not an option.

So we have scientific evidence.

They seem to deliver the grim news that we are facing the most transformative development since industrialization.

In fact, what we have to do in the next 40 years is far more dramatic and exciting than what we did when we moved to where we are today.

Now, science does indeed show that in innovative options for building resilience on a finite planet, we can achieve a prosperous future within a secure operating space if we act collaboratively and simultaneously at the global level from local to global.

thank you.

Tyler Dewar: My feeling right now is that all the other speakers said exactly what I wanted to say.

(laughs) And it seems like the only thing left for me is to thank everyone for their kindness.

TD: But in appreciation of your kindness, let me tell you a little story about myself.

TD: From an early age, I was given many responsibilities, but when I was younger, it always felt like everything was in front of me.

Everything was already planned for me.

I was given the clothes I needed to wear and was told where I needed to wear them, knowing that they were sacred and important. Given these very precious and sacred looking robes.

TD: But before that kind of formal lifestyle happened to me, I lived in Eastern Tibet with my family.

And when I was seven years old, suddenly a search party arrived at my house.

They were looking for the next Karmapa and I found them talking to my father and mother and word reached me that they said I was the Karmapa.

And lately people often ask me, "How did that feel?"

How did you feel when they came and took you away and your lifestyle changed completely?

And I'll say mostly, at the time, it was a very interesting idea to me.

I thought it would be a lot of fun and there would be more to play with.

(laughs) TD: But it didn't turn out to be as funny or funny as I thought it would be.

I was in a fairly tightly controlled environment.

And soon, various responsibilities were placed on me, in terms of education and so on.

I was separated from most of my family including my father and mother.

I didn't have many personal friends to spend time with, but I was expected to perform these prescribed duties.

So, it turned out that my fantasies about an enjoyable life as a Karmapa would not come true.

It felt more true to me that I was being treated like a statue and made to sit like a statue in one place.

TD: Nevertheless, I felt that despite being separated from my loved ones, and of course even further apart now.

At the age of 14, I fled Tibet and became even more estranged from my father, mother, relatives, friends and my homeland.

But nevertheless, there is no real sense of separation in my heart in terms of the love I feel for these people.

I still feel a very strong love connection to all these people and this land.

TD: I still keep in touch with my father and mother, albeit less frequently.

I talk to my mother on the phone only once on a sunny day.

And in my experience, when I talk to her, the feeling of love that binds us brings us closer and closer with each passing hour of our conversation.

TD: Those were just a few remarks about my personal background.

And when it comes to the other thing I wanted to share with you, which is ideas, I think it's great to have a situation like this where a lot of people from different backgrounds and places can come together, exchange ideas and build friendships with each other.

And I think this epitomizes what we're seeing across the world, that the world is getting smaller and that everyone around the world is enjoying more opportunities to connect.

That's great, but you also have to remember that a similar process must be happening under the hood.

In addition to the outer development and increased opportunities, not only the outer connection, but also the inner development and the heart connection must be deepened.

So this week, we talked about design.

I think we must not forget that we need to continue working on the design of the heart.

We've heard a lot about technology this week, but it's important to remember to invest a lot of energy into improving your heart's technology.

TD: So, while I am somewhat satisfied with the wonderful developments that are happening in the world, I still feel hampered in terms of our ability to connect with each other on a heart-to-heart or heart-to-heart level.

I feel that there are some parts that are in the way.

TC: My relationship with this concept of the heart-to-heart connection or heart-to-heart connection is interesting. Because as a spiritual leader, I always try to open my heart to others and offer them a true heart-to-heart, heart-to-heart connection. But at the same time, I have always been advised that we need to value intelligence over heart-to-heart connections. Then something dangerous might happen to me.

So there's an interesting paradox at work there.

But one time, a group from Afghanistan came to visit me and we had a very interesting conversation, and I had a very impressive experience.

TD: So we're talking about the Bamyan Buddha. As you know, they were destroyed in Afghanistan a few years ago.

But the basis of our conversation was the different approaches to spirituality on the part of the Muslim and Buddhist traditions.

Of course, Islam revolves around the concept of idolatry, so we don't often find physical representations of divinity or spiritual liberation in the Buddhist tradition. The Buddhist tradition, of course, is full of highly revered Buddha images.

So we were talking about the difference between tradition and what many people perceive as the tragedy of destroying the Buddha in Bamyan, and I suggested that we could look at this positively.

What we saw in the destruction of the Bamiyan Buddha was the depletion of matter, the fall and disintegration of some solid matter.

Perhaps it can be seen as akin to the fall of the Berlin Wall, where the divide that separated two types of people has collapsed, opening the door for further communication.

I think it's always possible to derive something positive in this way that will help us understand each other better.

TD: So, regarding the development that we've been talking about at this conference, I really feel that the development that we do should not be an additional burden on us humans, but should be used to improve our fundamental lifestyle of how we live in the world.

TD: Of course, I rejoice in the development and growth and rise of this noble land, the great nation of India, but at the same time I think we need to recognize that some aspects of this rise, as some of us admit, have come at the expense of the very foundations on which we stand.

So when we climb trees, some of the things we do to climb trees are actually eating into the roots of the tree itself.

So I think it boils down to whether we can not only get information about what's going on, but pay attention to it and thereby change our motivation to be more sincere and genuinely positive.

This week we heard, for example, of the terrible suffering that so many women around the world endure every day.

We have that information, but we often don't really pay attention to it.

We do not choose to actually allow it to cause a change of heart in ourselves.

So I believe that the way the world moves forward, the way of outer development that is in harmony with the true source of happiness, is for us to accept information that really makes a difference in our own minds.

TD: So I think that sincere motivation is very important to future well-being, a deep sense of human well-being. I think that means immersing yourself in what you are doing now.

Whatever work you are doing to benefit the world, immerse yourself in it and savor it to the fullest.

TD: I mean, we've taken a million breaths in total since we got here this week, and while we probably haven't witnessed a change of course in our lives, we often miss very subtle changes.

And I think that sometimes we make up a grand conception of what happiness looks like to us, but I think that with every breath that we pay attention to, we find that there is a small symbol of happiness.

TD: So all of you here are very talented and have a lot to offer the world. I think it would be a good note to conclude by taking a moment to say thank you for being able to come together and exchange ideas in this way, and how lucky we really are to have taken the good things, the momentum and the positivity from this conference and really created within ourselves a strong ambition and energy to spread it and instill it in every corner of the world.

His Holiness Karmapa: Tomorrow is my lecture.

TD: Lakshmi has worked incredibly hard even in inviting me, not to mention everything else she has done to make this happen. And I had some resistance at times and was also very nervous throughout the week.

I was feeling sick, dizzy, etc. and people asked me why.

"Because I have to talk tomorrow," he said.

Lakshmi had to endure all of that with me, but I am so grateful she gave me the opportunity to be here.

And thank you very much to all of you.

(Applause) HH: Thank you.

(applause)

Hi guys.

Hello.

In South Africa, where I'm from, 'saubona' means 'hello' in Zulu.

The literal translation of ``Saubona'' is ``I see you, and by looking at you I create you'', so there is a beautiful and powerful meaning behind this word.

So beautiful, imagine being greeted like that.

But what do we need to see ourselves?

Do our thoughts, feelings, and stories help us thrive in an increasingly complex and challenging world?

This important question has been central to my life's work.

Because everything depends on how we deal with our inner world.

Every aspect of how we love, how we live, how we raise our children, how we lead.

The traditional view of emotions as good or bad, positive or negative is rigid.

And rigidity in the face of complexity is detrimental.

A higher level of emotional agility is required for true resilience and prosperity.

My journey on this mission began not in the hallowed halls of a university, but in the rough and tender work of life.

I grew up in a white suburb of apartheid South Africa. South Africa is a country and community committed to the invisible.

to denial.

It is that denial that enables 50 years of racist legislation while people believe they have done nothing wrong.

Yet I learned for the first time about the destructive power of denial on a personal level before realizing what it was doing to the country of my birth.

My father passed away on Friday.

He was 42 and I was 15.

My mother whispered that I should go and say goodbye to my father before I left for school.

So I put down my backpack and walked down the hallway to where my father lay dying of cancer in the center of the house.

His eyes were closed, but he knew I was there.

In his presence I always felt watched.

I told him I loved him, said goodbye and headed off to work for the day.

In school I drifted from science to mathematics to history to biology, just like my father disappeared from the world.

From May to July and from September to November, I was smiling as usual.

I didn't drop a single grade.

When asked how I was doing, I shrugged my shoulders and said, "I'm fine."

I was praised for being strong.

I was a master of okay.

But back home, we had a hard time. During his illness, my father was unable to continue his small business.

And the mother was alone, grieving for her beloved, who was trying to raise three children, and creditors were knocking.

As a family, we felt financially and emotionally devastated.

And I quickly became isolated and started to fall into a vicious cycle.

I started using food to numb the pain.

Bing and Purge.

Refused to take all the weight of my grief.

No one knew, and I assumed that in a culture that values ​​constant positivity, no one wanted to know.

But there was one person who did not agree with my story of overcoming grief.

My eighth grade English teacher looked at me with fiery blue eyes as he held out a blank notebook.

“Write what you are feeling,” she said.

Tell the truth.

Write like no one is reading. ”

And just like that, I was invited to truly face my grief and pain.

It was a simple act, but for me it was nothing less than a revolution.

This revolution, which began 30 years ago with this blank notebook, has shaped my life's work.

Secret and silent correspondence with myself.

Like a gymnast, I have moved beyond stubborn denial to what I now call emotional alertness.

The beauty of life is inseparable from its fragility.

We are young until we are no longer young.

We walk the streets sexy, but one day we find ourselves not being seen.

We nudge our children, but one day we find that where the child used to be, there is silence, and now he is soaring into the world.

We are healthy until we get diagnosed and break our knees.

The only certainty is uncertainty, and yet we have not successfully or sustainably overcome this vulnerability.

The World Health Organization has announced that depression is now the single leading cause of disability worldwide, surpassing cancer and heart disease.

And in a time of greater complexity and unprecedented technological, political, and economic change, we are increasingly trapped in rigid reactions to people's emotions.

On the one hand, we may be obsessed with our feelings.

trapped in our heads.

trapped in righteousness.

Or your news feed fell victim.

On the one hand, we may contain and push our emotions aside, allowing only those we feel are legitimate.

A recent survey I conducted of more than 70,000 people found that one-third of us — one-third — judge ourselves to have so-called “bad emotions” such as sadness, anger, or even sadness.

Or try to actively push these feelings away.

We do the same not only to ourselves, but to those we love, like our children. We may inadvertently humiliate them with perceived negative emotions, jump to solutions, and fail to help them see that those emotions are inherently valuable.

Normal, natural feelings are now viewed as good or bad.

And being positive has become the new form of moral correctness.

Cancer patients are automatically told to just stay positive.

Ladies, please stop being so angry.

And the list goes on.

it is oppression.

It is the tyranny of positivity.

And it's cruel.

unkind.

and inefficient.

And we do it to ourselves and to others.

If depression, bottleling, and false positives all have one thing in common, it's this. They are all strict reactions.

If there's one lesson we can learn from the inevitable collapse of apartheid, it's that strict denial doesn't work.

it is unsustainable.

For individuals, for families, for society.

And watching the ice sheets melt proves to be unsustainable for our planet.

Research into emotional suppression shows that emotions become stronger when they are pushed aside or ignored.

Psychologists call this amplification.

Like the delicious chocolate cake in your fridge, the more you try to ignore it...

(Laughter.) Its dominance is even greater.

When you ignore unwanted emotions, it may seem like you are controlling them, but in reality they are controlling you.

There will always be internal pain.

everytime.

And who will pay the price?

that's right.

our children, our colleagues, our communities.

Now, don't get me wrong.

I am not anti-happiness.

i like to be happy

i am a very happy person

But when we push aside normal emotions and embrace false positive thoughts, we lose the ability to develop the skills to deal with the world as it is, not the one we want it to be.

I've had hundreds of people tell me what they don't want to feel.

Say things like, “I don’t want to be disappointed, so I don’t want to try.”

Or, "I want to erase this feeling."

"Okay," I tell them.

"But you have targets for dead people."

(Laughter) (Applause) Only dead people are not unwanted or harassed by their emotions.

(Laughter) Only dead people never get stressed, never get heartbroken, never experience the disappointment that comes with failure.

Painful emotions are part of our contract with life.

You can't have a meaningful career, raise a family, or leave a better world without stress and discomfort.

Discomfort is the price of admission to a meaningful life.

So how can we remove rigidity and embrace emotional agility?

As that young schoolgirl, when I leaned against the blank page, I began to let go of my feelings for what I was supposed to experience.

And instead, I began to open up to what I felt.

pain.

and sorrow.

and losses.

and regret.

Research shows that a thorough acceptance of all our emotions, even those that are troubling and difficult, is the foundation for recovery, thriving, and truly authentic happiness.

But emotional alertness is about more than just accepting emotions.

We also know that accuracy is important.

In my own research, I've found that words are essential.

We often use quick and easy labels to describe our emotions.

"Stressed" is the most common phrase we hear.

But there's a world of difference between stress and disappointment, or stress and knowing that you're in the wrong career.

Accurately labeling your emotions can help you better identify the exact cause of your emotions.

Then, what scientists call our brain's readiness potential is activated, enabling us to take concrete steps.

But it's not just a step, it's the right step for us.

Because our emotions are data.

Our emotions contain a flashing light for what we hold dear.

In our world, we tend not to feel strong emotions about things that have no meaning.

If reading the news makes you angry, perhaps that anger is a sign that you care about fairness and fairness, and an opportunity to take positive steps to shape your life in that direction.

Being open to difficult emotions can create a value-aligned response.

However, there is an important caveat.

Emotions are data, not instructions.

We can mine emotions according to their values ​​without having to listen to them.

Just as I can stand by my son who is dissatisfied with his little sister, I cannot support his idea of ​​giving his sister away to the first stranger he meets at the mall.

(Laughter) We own our emotions, but they don't own us.

Internalizing the difference between what I feel wisely and what I do by acting in line with my values ​​creates a path to being the best version of myself through emotion.

So what does this actually do?

When you feel strong and painful emotions, don't race for an emotional outlet.

Learn its contours and show up in your mind's diary.

What do emotions tell us?

And try not to say "I am" like "I am angry" or "I am sad".

When you say "I am" it sounds as if you are the emotion.

On the other hand, you are you and your emotions are your data source.

Instead, try to notice what the feeling is. 'I found myself feeling sad' or 'I found myself feeling angry'.

These are essential skills for us, our families and our communities.

They are also important for the workplace.

In my research, looking at what helps people reach their full potential at work, I found a strong key factor: personal attention.

Engagement, creativity and innovation within an organization flourish when people are able to feel their own emotional truth.

Diversity is not only in people, but also in people.

Including emotional diversity.

The most agile and resilient individuals, teams, organizations, families and communities are built on openness to normal human emotions.

This allows me to say, "What are my emotions telling me?"

“Which behavior brings me closer to my values?”

“Which one separates me from my values?”

Emotional agility is the ability to follow your emotions with curiosity, compassion, and especially the courage to take value-based steps.

When I was young, I used to wake up at night with a fear of death.

My father comforted me with gentle strokes and kisses.

But he never lied.

"Susie, we're all going to die," he used to say.

"It's normal to be scared."

He didn't try to create a buffer between me and reality.

It took me a while to realize how he guided me through that night.

He taught me that courage is not the absence of fear. Courage is the fear of walking.

Neither of us knew he would be gone in just ten years.

And that time is too precious and too short for each of us.

But when we face our vulnerability, in its ultimate hour, we will be asked, "Are you agile?"

"Are you agile?"

Feel free to say yes to the moment.

The “yes” that comes from a lifelong correspondence with your heart.

And in seeing yourself.

Because by looking at yourself, you can also see others. Because that's the only sustainable way to move our fragile and beautiful world forward.

Hello.

And thank you.

(laughs) Thank you.

(Applause.) Thank you.

(applause)

Think about your own biggest goals.

Really -- wait a minute. To learn it, you have to feel this.

Take a few seconds and think about your biggest personal goal.

Now imagine deciding to do it.

Imagine telling someone you meet today what you are going to do.

Imagine their words of congratulations and their high image of you.

Don't you think it feels good to say it out loud?

Don't you feel like it's already part of your identity?

Well, bad news. I should have kept my mouth shut. Because your current good mood makes you less likely to do so.

Repeated psychological tests have proven that telling someone your goals makes them less likely to come true.

Whenever you have a goal, there are going to be some steps or work that need to be done to reach it.

Ideally, you won't be satisfied until you actually do the work.

But psychologists have discovered that when you tell someone your goals and they acknowledge it, it's called "social reality."

The mind is tricked into feeling like it's already done.

And because you've felt that satisfaction, you're less motivated to do the hard work that actually needs to be done.

(Laughter) Does this go against the conventional wisdom that you should tell your friends what your goals are?

So they make us stick to it.

Now let's look at the proof.

1926: Kurt Lewin, founder of social psychology, called this “substitution.”

1933: Vera Mahler discovers that being recognized by others feels real inside.

In 1982 Peter Gollwitzer wrote a book about this and published it in 2009 with some new tests.

The results are as follows: 163 people passed 4 separate tests.

Everyone wrote down their personal goals.

And half of them announced their commitment to this goal in the room, and the other half didn't.

Everyone was then given 45 minutes of work to connect directly to their goals, but were told they could stop at any time.

Now, those who were tight-lipped worked the entire 45 minutes on average, but when asked later they said they felt they still had a long way to go to reach their goals.

But those who presented it quit after just 33 minutes on average, and when asked afterwards said they felt they were pretty close to reaching their goal.

So if this is true, what can we do?

Well, you can also resist the temptation to announce your goals.

You can delay the gratification of social approval and understand that your mind can confuse what it says and what it does.

But if you need to talk about something, you can state it in an unsatisfying way, like, "I want to run this marathon, so I need to train five times a week. If I can't do that, it's going to be hard, right?"

So viewers, what would you say the next time you want to tell someone about your goals?

(pauses) Exactly! wonderful.

(laughter) (applause)

I was 17 when I chose my career.

On a hot summer night in Florida, I was standing outside just a few miles from the ocean.

I was waiting for a miracle to happen.

That summer, I had the opportunity to work as an intern at NASA's Kennedy Space Center. The miracle I was waiting for was the launch of the Columbia Space Shuttle with the Chandra X-ray Observatory, a telescope that allows scientists to peer into the edge of a black hole.

The whole sky was filled with light.

And it was like the middle of the night.

Soon I felt the roar of the engine vibrating in my chest.

And it was no miracle. It was the collective effort of thousands of teams working together to make the seemingly impossible a reality.

And I wanted to join that team too.

So I decided to apply for a university where I could study aerospace engineering.

The following year, I began my engineering residency at the Massachusetts Institute of Technology, participating in a student project to build a space robot.

And everything was going according to my plan, except that I was confused about something important.

Well, my confusion happened during summer vacation.

I went to a school in Kenya where I volunteered with girls aged 5 to 17 and taught English, math and science classes.

And they taught me Swahili songs.

And most of the time I just spent time getting to know the girls and enjoying their presence.

And I've seen these girls and community leaders overcome significant barriers to ensure they have the best possible chance in life.

And I wanted to join that team too.

I wanted to be part of a team that would help break down barriers and improve the lives of girls around the world.

However, I was worried that studying aerospace engineering would not be very useful.

I was worried that this team in Kenya would not be able to use the technology I was learning about space.

But thankfully I still learned what I was doing wrong.

I returned to NASA and interned at NASA again. And in turn, our leaders taught us that countries like Kenya have been using space technology for decades to improve their lives.

Then I learned that I could pursue a career in space and development.

This idea is not new.

In fact, in 1967, the nations of the world worked together to create the Outer Space Treaty.

The treaty boldly declared that "the exploration and use of outer space should continue for the benefit of all peoples, regardless of their level of economic or scientific development."

People have been trying for decades to make this a reality, but we have never truly achieved this ideal.

Forces such as colonialism, racism, and gender inequality have actually excluded many from the benefits of space, leading us to believe that space is for the few, the rich, and the elite.

But we cannot take this attitude because the world is on an important mission to improve the lives of everyone.

The mission's roadmap is based on the United Nations' 17 Sustainable Development Goals.

All Member States of the United Nations agree that these are priorities from now until 2030.

These goals give us a pivotal moment and opportunity in our time to end extreme poverty and ensure access to food and clean water for all.

We as an international community must pursue these goals.

And technology from space supports sustainable development.

In fact, there are six space services that help pursue the Sustainable Development Goals.

In the next few minutes, let's take a closer look at these six services and see just a few examples of the goals they support.

do you prepare

OK。

Communications satellites provide access to telephone and Internet services almost anywhere on earth.

This is especially important during disaster recovery.

When Typhoon Haiyan hit the Philippines, the local communications network needed to be repaired, and the team brought in an inflatable communications antenna that could connect to satellites.

This was useful during repairs and restorations.

Positioning satellites tell us where we are by telling us where the satellites are.

Scientists can use this technology to track endangered wildlife.

This turtle is equipped with a system that receives position information from positioning satellites, and the position information is transmitted to scientists via communication satellites.

Scientists can use this knowledge to develop better policies and help determine how to keep these animals alive.

Earth observation satellite.

They tell us what is happening in our environment.

There are currently about 150 satellites in operation by over 60 government agencies, and these are the only satellites observing the Earth.

And meanwhile, more companies are joining the list.

Most governments provide data from their satellites online for free.

Some of these satellites also provide images like this one showing what the camera sees.

Here is an image showing farmland in Kansas.

But most Earth observation satellites don't take pictures at all.

they take measurements.

These measurements are then combined with complex computer models to create beautiful global visualizations of global ocean currents and ocean temperatures like this one.

Or you can look at annual cycles of atmospheric salinity, smoke, dust, global rainfall, snowfall, and vegetation on land and in the ocean.

Scientists can now use this information about rainfall and vegetation to understand which regions of the globe are at risk of starvation and drought, and provide that information to aid agencies so they can prepare food aid before hunger becomes severe.

In space, the International Space Station has an orbiting laboratory.

The vehicle and everything in it are in free fall around the Earth and are not affected by gravity.

For this reason, we call it "microgravity".

When astronauts are in a microgravity environment, their bodies react as if they are aging rapidly.

Bones and muscles become weaker, and the cardiovascular and immune systems change.

As scientists study how to keep astronauts healthy in space, we can pass on the exercises and techniques that astronauts do to people on Earth to improve their health here.

In many cases, as we develop technology for astronauts, exploration, and spacecraft, we can also transfer those inventions to improve life on Earth.

Here is one of my favourites.

This is a water filtration system, a key component of which is based on technology for filtering space station wastewater.

It is now used all over the world.

Space is also an endless source of inspiration through education, research, astronomy and the age-old experience of stargazing.

Today, nations around the world are advancing their development by enhancing local knowledge of engineering, science and space.

Meet the world's newest satellite engineer.

I'm Erica Avello from Venezuela.

Erica is training as a satellite engineer as part of Venezuela's National Satellite Program.

She designed a software tool to help her team better design power systems for engineering.

I'm Adele Castillo-Durán from the Philippines.

Adele is a meteorologist as well as a satellite engineer and uses data from satellites for weather forecasting.

And finally meet Hara.

Originally from Sudan, Hala studied electrical engineering at an undergraduate degree in Khartoum, and decided to build her own satellite with a few students.

And then Hara won a scholarship to study satellite engineering at the graduate level.

These stories that I have shared with you show how space can truly serve sustainable development for the benefit of all.

But we still have a lot of work to do as there are still barriers that keep people out of space and limit the impact of this technology.

For many people, Earth observation data is complex.

And satellite communication services are too expensive.

And microgravity research seems totally inaccessible.

This is what motivates my work as a professor at the MIT Media Lab.

I recently started a new research group called Space Enabled.

We are working to tear down these barriers that limit the benefits of the universe.

We will also develop future applications that will continue to contribute to sustainable development.

We will continue this work until we can truly say that the Universe is for the benefit of all and that we are all capable of it.

thank you.

(applause)

This strange-looking plant is called jaleta.

What looks like moss covering the rocks is actually a shrub with thousands of branches, each with a small clump of green leaves at the end, so dense that you can actually stand on them.

This individual lives in Chile's Atacama Desert and is a whopping 3,000 years old.

It is also a relative of parsley.

For the past five years, I have traveled the world, working with biologists to find life that is over 2,000 years old.

This project is both art and science.

There are environmental elements.

And I'm also trying to create a way to get out of the mundane experience of time and start thinking about deeper timescales.

I chose 2,000 as my minimum age because I wanted to start with what we consider to be year zero and work backwards from there.

What you are looking at now is a tree called Jomonsugi, which lives on the remote islands of Yakushima.

In part, this tree was the impetus for the project.

I was traveling to Japan for nothing but photography, but when I learned about this 2,180-year-old tree, I knew I had to go.

It wasn't until after I actually got back home in New York that I came up with the idea for this project.

So it was a slow churn.

I think my long-standing desire to bring my interests in art, science, and philosophy together has prepared me for when the proverbial light bulb comes on.

So I started researching, and to my surprise, this project had never been done before in either the humanities or the sciences.

And, perhaps naively, I'm surprised that there isn't even a branch of science that deals with this idea of ​​global species longevity.

What you are looking at here is Rhizocarpon geographicum, or map lichen. It's about 3,000 years old and lives in Greenland, but it's a long way to go for some lichens.

Visiting Greenland was more like traveling back in time than just traveling far north.

It was so primal and so far removed from anything I had ever experienced.

And this is enhanced by some special experiences.

One was when I was boated down in a remote fjord and realized that the archaeologist I was supposed to meet was nowhere to be found.

And since I can't text or shoot emails, I was literally left to my device.

But luckily it obviously worked, but it was a humbling experience to feel so disconnected.

And a few days later we had the opportunity to fish in a glacial river near our campsite. The fish were so plentiful there that you could literally reach into the river and catch a trout about a foot with your bare hands.

It was as if we had entered a more innocent time on earth.

And, of course, there are lichens.

These lichens grow only one centimeter every 100 years.

I think it really puts the human lifespan in a different perspective.

What you see here is an aerial view of eastern Oregon taken from above.

If the title "Searching for Almiraria's Death Ring" sounds creepy, it is.

Armillaria is actually a predatory fungus that kills certain types of trees in forests.

Honey mushrooms are also commonly known as honey mushrooms, or "giant fungi," as they are one of the largest organisms in the world.

So, with the help of a biologist who studies the fungus, he got a map and GPS coordinates and chartered a plane to start looking for the dead ring, the circular pattern the fungus kills trees.

I don't know if there are fungi in this photo, but I'm pretty sure they are there.

And when this returns to the ground, we find that the fungus has indeed invaded this tree.

So the white substance you see between the bark and the wood is the mycelium of this fungus, and what it's doing is actually slowly strangling the wood by blocking the flow of water and nutrients.

So this strategy has worked pretty well for 2,400 years.

And from underground to water.

This is a 2,000-year-old Brain Coral that lives in Tobago.

And to find this out, I had to overcome my fear of deep water.

It's about 60 feet deep here, or 18 meters.

And you can see some damage on the coral surface.

In fact, it was caused by a shoal of parrotfish starting to eat it, but luckily they lost interest before they could kill it.

Fortunately, the recent oil spill seems to have spared it.

But with that being said, we could easily lose one of the oldest creatures on earth, and the full impact of that disaster is yet to be revealed.

I believe this is one of the most silently resilient things on the planet.

This is literally a cloned colony of 80,000-year-old quaking poplar trees in Utah.

What looks like a forest is actually just a single tree.

Imagine it as one giant root system, with each tree as a trunk emerging from that system.

So what you have is a giant, interconnected, genetically identical individual that's been around for 80,000 years.

It is also male and theoretically immortal.

(Laughter) This is also a clone tree.

This is the spruce Gran Picea, but at 9,550 years old it's just a baby in the forest.

The location of this tree is actually kept secret for its own protection.

I spoke to the biologist who discovered the tree, and he said that those elongated growths in the center are likely a product of climate change.

Vegetation zones are really changing as the mountain tops warm up.

So we don't even necessarily have direct contact with these organisms in order to actually affect them.

This is a Fortingall yew -- no, I'm kidding -- this is a Fortingall yew.

(Laughter) But I put that slide in because people often ask if there are any animals in this project.

Coral aside, the answer is no.

Anyone know how old the oldest tortoise is? Any guesses?

(Audience: 300) Rachel Sussman: 300? No, 175 is the oldest surviving turtle, so it's not even 2,000 years old.

And you may have heard of this giant 405-year-old tree found off the coast of northern Iceland.

However, he died while his age was being measured in the lab.

I think the most interesting recent discovery is the so-called immortal jellyfish. This has actually been observed in the lab to be able to revert to the polyp state after full maturity.

That said, wild jellyfish are highly unlikely to survive that long.

Now back to the yew story.

As you can see, this is in the churchyard. Located in Scotland. Behind the protective wall.

In fact, churchyards all over England are full of old yew trees, but if you do the math, you'll remember that it was actually the yew tree that was there first, then the church.

And now to another part of the world.

I had the opportunity to travel to South Africa's Limpopo province with a baobab tree expert.

And we've seen some of them, but this is probably the oldest.

It is about 2,000 and is called Sagore Baobab.

And as you know, I consider all these creatures to be palimpsests.

They contain their own histories spanning thousands of years, as well as records of natural and human events.

Baobabs in particular are a good example.

You can see that this has a name carved into the trunk, but it also records some natural phenomena.

As a result, baobabs tend to become fleshy and hollow as they grow.

And while this can create wonderful natural havens for animals, it's also been repurposed for some pretty dubious human uses, like bars, prisons, and even toilets in trees.

And this brings me another one of my favourites. I think it's because it's so rare.

The plant, called Welwitschia, is only found in some coastal areas of Namibia and Angola, and has a unique adaptation for collecting moisture from fog coming from the sea.

And it's actually wood.

A primitive conifer.

You can see that there is a bearing cone in the center.

And while it looks like two large piles of leaves, it's actually two single leaves that get shredded by the harsh desert conditions over time.

It also has the longest leaves in the plant kingdom because it never loses its leaves.

I spoke to biologists at the Kirstenbosch Botanical Gardens in Cape Town to ask where they think this amazing plant came from. His idea is that if you travel through Namibia, you will find that there are numerous fossilized forests and that they are all about logs. The logs are all huge conifers, yet there are no indications as to where they came from.

So he thought that floods in northern Africa had actually knocked down conifers tens of thousands of years ago, resulting in an amazing adaptation to this unique desert environment.

I think this is the most poetic of the oldest creatures.

This place is called the Underground Forest.

So I spoke to a botanist from the Pretoria Botanical Gardens, who explained that certain types of trees are adapted to the region.

It's a dry, fire-prone bushveld area, and likewise what these trees have been doing is if you imagine this is the crown of the tree and this is above ground, imagine that the whole tree, most of it, has moved underground and only the leaves are above the surface.

Then when the fire burns, it is the same as burning your eyebrows.

Trees are easy to recover.

They also tend to grow clonally, with the oldest being 13,000 years old.

Back in the US, I have several plants of similar age.

This is a cloned creosote bush about 12,000 years old.

If you've been to the western United States, you know creosote bushes grow everywhere, but with that said, you'll find them in this unique circular shape.

And what's happening is that it's slowly expanding outward from its original shape.

And it is one, again, an interconnected root system, one genetically identical individual.

I have friends nearby. Well, I guess they are friends.

This is a clone Mojave Yucca, about a mile away and a little over 12,000 years old.

And you can see that it has a similar circular shape.

And the landscape behind it is dotted with young clones.

And both of these yucca and creosote shrubs live on Land Management land, which is very different from being protected in a national park.

In fact, the land is designated for recreational all-terrain vehicle use.

So now I want to show you what could possibly be the oldest living thing on earth.

This is a Siberian actinomycete, 400,000 to 600,000 years old.

The bacterium was discovered years ago by a team of planetary biologists who wanted to find clues about life on other planets by examining one of the harshest environments on Earth.

And it was this bacterium that they discovered when they studied permafrost.

But what makes it unique is that it repairs DNA at freezing temperatures.

What that means is that it's not dormant, it's actually been living and growing for 500,000 years.

It is also probably one of the most vulnerable of the oldest organisms, as it cannot survive thawed permafrost.

Here's a map I put together of the oldest living things. That way you'll know where they are. they are all over the world.

The blue flags represent what I've already captured and the red flags are where I'm still trying to get to.

It turns out that Antarctica also has a flag.

I'm about to travel there to find the 5,000-year-old moss that inhabits the Antarctic Peninsula.

So there are probably two more years left on this project, this phase of the project, but after five years, I feel like I know what lies at the heart of this work.

The world's oldest living beings are a record and celebration of our past, a call to action in the present, and a barometer of our future.

For thousands of years, they have survived in deserts, permafrost, mountain tops, and ocean floors.

They have endured immense natural perils and human encroachments, but now some of them are in danger and they can't just stand up and stand in their way.

By going to find these creatures, we hope to draw attention to their amazing resilience and help ensure their longevity for the foreseeable future.

thank you.

(applause)

Well, that's kind of an obvious statement.

I started with that sentence about 12 years ago. We started in the context of developing countries, but you are sitting here from all corners of the world.

So if you think of a map of your own country, you will find that you can draw a small circle on every country on earth and say, "This is where good teachers don't go."

Moreover, they are also sources of trouble.

That's where the ironic problem arises. Good teachers don't want to go only where they are needed most.

In 1999 I started trying to address this problem experimentally. It was a very simple experiment in New Delhi.

I basically embedded a computer in the walls of a New Delhi slum.

Most of the children did not go to school and did not know any English. I had never seen a computer before and had no idea what the Internet was.

I hooked it up to high-speed Internet -- it was about three feet off the ground -- turned it on and left it there.

After this, I noticed some interesting things.

However, after repeating this across India and much of the world, I found that children learn what they want to learn.

This is the first experiment we have done. The 8-year-old boy on the right is teaching his 6-year-old girl how to browse.

This boy is here in the middle of central India. This is in a village in Rajasthan. There, children record their own music, play it to each other, and thoroughly enjoy themselves in the process.

They did all this in four hours after seeing the computer for the first time.

In another village in South India, the boys were trying to build a video camera to take pictures of bumblebees.

They downloaded it from Disney.com or one of these websites 14 days after setting up the computer in the village.

So, in the end, we came to the conclusion that a group of children could learn to use computers and the Internet on their own, regardless of who was where.

At that point, I decided to get a little more ambitious and try to find out what else my kids could do with computers.

We started with a group of children in Hyderabad, India. They spoke English with a very strong Telugu accent.

I gave them a computer with a speech-to-text interface available for free on Windows and asked them to speak into it.

So when they spoke to it, the computer typed gibberish, and they said, "Well, it doesn't understand anything we're saying."

So I said, "Yes, I'll leave it here for two months."

Let the computer understand itself. ”

Then the children said, "How do you do it?"

And I said, "I don't really know."

(laughter) And I left.

(Laughter) Two months later, and this is now documented in the Journal of Information Technology for International Development, I found that the accent had changed and was strikingly close to the neutral British accent when I trained the speech-to-text synthesizer.

In other words, they were all talking like James Tooley.

(Laughter.) So they can do it themselves.

After that, I started experimenting with various other things they might be able to do on their own.

I got an interesting phone call once from Colombo, the late Arthur C. Clarke. It was like, "I want to see what's going on."

And he couldn't travel, so I went there.

He said two interesting things: "A teacher who can replace machines should be like that."

(Laughter) The next thing he said was, "When kids are interested, education happens."

I was doing it on set, so every time I saw it, I thought of him.

(Video) Arthur C. Clarke: And they can definitely help people because kids quickly learn to navigate the web and find things of interest.

And if you are interested, you can get an education.

Sugata Mitra: I took the experiment to South Africa.

This is a 15 year old boy.

(Video) BOY: ...just for the record, I play games and listen to music like an animal.

SM: So I asked him, "Would you like to send an email?"

And he said, "Yes, and they jump over the sea."

This is a story in Cambodia, Cambodian countryside. It's a fairly silly math game that no child plays in the classroom or at home.

they will throw it back at you.

They'll say, "This is so boring."

Leave them alone on the pavement and brag to each other about what they can do when all the adults are gone.

This is what these children are doing.

I think they are trying to multiply.

And all over India, after about two years, kids started Googleing their homework.

As a result, the teachers reported that their English improved significantly. (Laughter) A lot of things happened, like rapid progress.

They said, 'They really started to think deeply, and so on.

(Laughter) And indeed they were.

I mean, if Google has something, why should you stuff it in your head?

So, at the end of the next four years, I decided to enable a group of children to use the Internet to reach their own educational goals.

At that time, a lot of money was being put into Newcastle University to improve schooling in India.

Then I got a call from Newcastle. I said, 'I'll do it from Delhi'.

They said, 'We can't deal with £1million worth of university funds lying dormant in Delhi'.

So in 2006, I bought a thick overcoat and moved to Newcastle.

I wanted to test the limits of the system.

My first experiment outside of Newcastle was actually in India.

And I set myself an impossible goal. Is it possible for a 12-year-old Tamil-speaking child in a South Indian village to teach himself biotechnology in English?

So I said, ``Let's test it, they're going to get zero marks.

I called 26 children.

They all came there and I told them that this computer has some very difficult functions.

I wouldn't be surprised if you didn't understand anything.

All in English, let's go.

(Laughter) So I left them alone.

When I returned two months later, 26 children marched with very, very quiet faces.

I said, "So did you see anything?"

They said yes, they did.

"Did you find out anything?" "No, not at all."

So I said, "How long have you been practicing before you decide you don't understand anything?"

"We see it every day," they said.

So I said, "Have you been seeing something you don't understand for two months?"

There, a 12-year-old girl raised her hand and literally said, ``Other than the fact that improper replication of the DNA molecule causes genetic diseases, we understand nothing else.''

(Laughter) (Applause) (Laughter) It took me three years to publish it.

This paper has just been published in the British Journal of Educational Technology.

One of the judges who reviewed this paper said it was "too wasteful" and was not very good.

Well, one of the girls was a self-taught teacher.

And there she is.

Remember, they don't study English.

Edited the last part where you asked "Where are the neurons?"

And she said, "A neuron? A neuron," and then she saw this and did this.

Whatever the expression, it wasn't very good.

That is, their scores rose from zero to 30 percent, which is educationally impossible under the circumstances.

But 30% is not passing.

So it turns out they have a local accountant friend and a young girl who play football with her.

I asked the girl, "Can you teach them enough biotechnology to pass?"

And she said, "How do I do that? I don't know the subject."

I said, "No, let's use grandma's method."

She said, "What is it?"

I said, "All you have to do is stand behind them and admire them all the time.

Just tell them 'that's cool'. That's wonderful.

what is that? Could you do it again? Can you show me more? ” She kept doing it for two months.

Scores climbed to 50, a score obtained in a high-end school in New Delhi with trained biotechnology teachers.

So I went back to Newcastle with these results and decided that something was going on here and it was definitely getting very serious.

So, after experimenting with all sorts of remote locations, we arrived at the most remote location imaginable.

(Laughter) About 5,000 miles from Delhi, there's a small town called Gateshead.

In Gateshead we took 32 children and started fine-tuning the method.

I divided them into groups of 4 people.

I said, 'You make yourself a group of four.

Each group of 4 can use 1 computer, but not 4 computers. ”

Remember from the hole in the wall.

"You can also swap groups.

If you don't like your group, you can move to another group.

You can go to another group, look over their shoulder, see what they're doing, and then go back to your own group and claim it as your job. ”

And I explained to them that a lot of scientific research is done using that method.

(Laughter.) (Applause.) They eagerly followed me and said, "Now what do you want us to do?"

I asked them 6 GCSE questions.

The first group (the best group) solved everything in 20 minutes.

The worst is 45.

They used newsgroups, Google, Wikipedia, Ask Jeeves, whatever they knew.

The teachers said, "Is this deep learning?"

I said, 'Well, let's do it.

I will come back in 2 months.

We give them paper tests - no computers, no talking to each other, etc. ”

The average score was 76% when tested on computers and in groups.

When I did the experiment, when I tested two months later, the score was 76 percent.

I think the photographic memory in the children was probably because they were talking to each other.

A child in front of a computer would never do that.

In addition, the almost unbelievable result was that the score increased over time.

Because the teacher says that the children will continue to Google even after the class is over.

Here in England, after the Bowham experiment, we called out to our British grandmothers.

Well, British grandmothers are very energetic people.

200 of them immediately volunteered.

(Laughter) The contract was to sit at home one day a week and give me an hour of broadband time.

So they did it, and over the past two years, over 600 hours of teaching have been on Skype, using what students call the Granny Cloud.

Granny Cloud is sitting over there.

You can transfer it to any school of your choice.

(Video) Teacher: You can't catch me.

you say it

you can't catch me

Children: You can't catch me.

Teacher: I am the gingerbread man.

Children: I am the gingerbread man.

Teacher: Well done. very good ...

SM: Back in Gateshead, a 10-year-old girl was in the center of Hinduism in 15 minutes.

Well, what I don't know.

Two children are watching a TEDTalk.

They used to want to be soccer players.

After watching the TEDTalk eight times, he wants to be Leonardo da Vinci.

(Laughter.) (Applause.) It's that simple.

This is what I'm building right now, called SOLE (Self Organizing Learning Environment).

The furniture is designed so that children can sit in groups in front of a big screen and massive broadband connection.

You can call Grandma Cloud if you want.

This is Newcastle's SOLE.

The mediator is from Pune, India.

How far can we go? I'll stop by saying just a few words at the end.

I went to Turin in May.

I kept all my teachers away from my group of 10 year olds.

I only spoke English and they only spoke Italian so we couldn't communicate.

I started writing English questions on the blackboard.

The children saw it and said, "What?"

I said, "Okay, let's do it."

They typed it into Google, translated it into Italian, and put it back into Italian Google.

15 minutes later -- Next question: Where is Calcutta?

This time it took just 10 minutes.

At that time, I really tried my best.

Who was Pythagoras and what did he do?

There was some silence, after which they said, "It's misspelled.

It's Pythagora. ”

And after 20 minutes, right triangles started appearing on the screen.

This sent shivers down my spine.

These are children 10 years old.

Text: We'll reach the theory of relativity in 30 minutes. after that?

(laughter) (applause) SM: So do you know what happened?

I think we just stumbled across a self-organizing system.

A self-organizing system is one whose structure emerges without explicit external intervention.

Also, self-organizing systems always show emergence. That means the system will start doing things it was never intended to do.

You react that way because it seems impossible.

I guess I can guess now. Education is a self-organizing system and learning is an emergent phenomenon.

It'll take a few years to prove it experimentally, but I'm willing to try.

But in the meantime, there are methods available.

1 billion children, we need 100 million mediators -- there are more mediators on earth -- 10 million SOLE, $180 billion and 10 years.

we can change everything.

thank you.

(applause)

The moment I say "school", many memories come to mind.

Every time I go outside after an exam, it's like the teacher says, "Come on, come on."

how was it? "

“I will definitely pass,” he said with a wide smile.

And I couldn't understand why on the one hand they say "tell the truth" and on the other hand they hate you when you tell the truth.

After all that, I didn't know where else to stay.

So I remember that night when I went to sleep asking for help from an unknown person. Because, for some reason, my father and mother did not believe what was presented as God in the puja room. Because my friend's family had another as God.

So I thought, "Maybe I should pray to the Unknown for help," and at that time I started asking for help from all corners and corners of my life.

The brothers started giving me some tips about painting.

Then, when I was about 13 years old and in the 8th grade, I started working part-time at a signboard artist called Putu.

And the school also started supporting me.

"Oh, he's not good at studying, but let him enter the drawing contest."

So I'm glad I survived using the little tools I found to find my place in school.

And in one of those contests, I won a tiny little transistor Philips radio.

And I didn't have the patience to wait until I got home.

So I switched it on loudly on the train.

On trains in India, you may see people listening to the radio and, of course, on their mobile phones.

I was 13 at the time and listened only to the radio. And someone happened to sit next to me, like the three sitting here.

You know, like right next to me.

He just started asking, "Where did you buy the radio? How much?"

I said, "It's an art competition prize."

Then he said, "Oh, I teach at an art college.

I think you should study at an art school.

Quit school and come there. ”

So why am I saying this, maybe the person sitting next to you can change your whole life, it is possible.

It's that we need to be open and fine-tuned.

So, after taking the exam three times, I entered art college, continued to explore what I really wanted to do in art, and finally came to you.

Looking back at what happened back then and the last 10-15 years, I see that most of my work revolves around three themes, and that wasn't intentional.

And we thought, "What is it that really makes us?" So we just start with tracing. -- You know, it's actually the past, and it's what makes a person.

This made me think that when looking at the past, the only way to understand the past is to know its traces, because it is impossible to go back to the past.

It can be ruins, music, paintings, paintings, writing, anything.

However, it is only a trace of those days.

And exploring that realm fascinated me.

So I was working on the line and instead of working on the trace I started capturing the trace.

Therefore, I would like to introduce some works this time.

Hence, it is called "self-progress".

It is only a trace of its existence in this body.

Now, what happened then, and what I really enjoyed, is that this sculpture is nothing less than my own imprint.

It looks like a 3D photo.

So there's the performance element, there's the sculptural element, there's the element of feeling yourself, very close to yourself.

So it's like a fossil of the future.

Then I moved slowly to explore other possibilities for capturing tracks.

So this is what I was talking about, it's such a great experience during the build. Because you have the freedom to walk, move your hands, move around the space. But the moment it hardens, I can't move an inch. Since this is plaster of paris, it looks like a liquid the moment you pour it. But after 20 minutes, it's almost like a hard stone.

So this is capturing the thumbprint imprint. Because whatever we do, whether consciously or unconsciously, we leave a mark here.

So I thought, ``Let's collect all the traces left as humans, such as thumbprints and footprints.''

This is the trail of fire, this is the trail of the sun.

Because this idea always comes to my mind when I'm capturing traces. Is it only when an object touches an object and leaves a trail, or are there other ways to capture it? ”

In other words, this work only reflects what is on the far side due to the focal length of the lens.

So I made a portrait of the sun from sunlight by focusing the paper which is an etching print.

This is called "from dawn to dawn".

What I've done here is just put 10 feet or so of paper and then some coconut rope and burn it.

So it took about 24 hours to get this line.

So wherever the fire burns the paper, it becomes the work, the detail.

Perception and context play a big role in understanding it, even if trying to understand it leaves a trail.

So do we really understand what it is, or are we trying to understand what we think it is?

Then go in the direction of questioning recognition. Because even if there are traces, if you try to understand them, you will find yourself playing a big role.

Let's say even a simple act.

How many people in India have seen cattle cross when coming from Bangalore to Mysore?

Could you please raise your hand?

Just ask for an opinion and anyone can interpret it.

For example, if a teacher at school said this, they would simply say, "To go to the other side."

You know why the cow crossed the road?

Had Potter said, the answer could have been very different.

Reverend Martin Luther King would say, "I imagine a world where all cows can freely cross the road without questioning their motives."

(Laughter) Imagine that. Moses came and saw the same cow walking down the street.

He surely said, "God came down from heaven and said to the oxen, 'You will cross the road.'" ”

(Laughter) Freud would say, "The fact that you're even slightly worried reveals your underlying sexual insecurities."

(Laughter) If you ask Einstein, he'll say, "Whether the cow crossed the road or the road moved under the cow depends on your frame of reference."

(laughter) Or a Buddha, seeing the same cow, would say, ``To ask this question is to deny your own nature as a cow.''

(Laughter.) So what we see is just what we often think about, and most of the time we don't know what it is.

It all depends on the person's perception.

And context, what is context really?

I can show you this little piece of paper.

I always think that meaning doesn't really exist.

There is no meaning to what we have created in this world.

It is only made by the mind.

Looking at this paper, this is the width, which is called the length.

We were taught that in school.

But if I break it in the middle, I didn't touch this width, but still, this changes the meaning.

So what we think of as meaning is not always there. Even if we say dark, bright, good, bad, high, low, it's the other side. All that means it doesn't exist in reality.

As humans, the way we are trained to perceive reality only creates this meaning.

In other words, most of the works from this period are "Light Makes Dark".

It just passed through the lamp.

So the lamp not only gives light, but also darkness.

So this is a work of art that seeks to explore that.

This is called "limit out".

This shows how limited our eyes, hearing and touch are. do we really see?

This is exactly the minus.

The walls are about 6 inches deep, but they appear to come out of the wall.

As you know, the walls are almost similar. This is the first skin, this is the second, and the third skin, each of which creates meaning.

And I'm in the process of removing the gallery walls.

Say it again, "inward out."

This is my own full figure cast.

It is approximately 8 inches deep.

At that time, I always wondered. Since working with creators, I now question perception. Every time I see a bird flying in the sky, I feel: Is there something behind it, or is there some mark on top that humans can't see?

Is there a way to bring that thought into visual art?

Could not be located.

But after about six or seven months of quiet immobility, when I was replacing the solid-to-vapor air freshener in my bathroom, I found a solution.

My name is O'Donneal.

This work is made using that material.

The process of making this sculpture was interesting. Because I wrote to Balsala, who makes an air freshener called O'Donnell, saying: "Dear Sir, I am an artist. This is my catalog.

Can you help me make this sculpture? ”

They never wrote me back.

So, I thought, "Let's go to the small-scale industry promotion section and ask for advice."

So I said to them, "I want to start an air freshener company."

They said, "Of course.

This is the charge for the project report. We will let you know all the details. ’ they passed.

Finally, I went back to them and said, 'Not to start a company, just to make my own work.

Please come to the show. ”

And they did.

This work is housed in the Devi Art Foundation, Delhi.

In India, no one really talks about works of art. They always talk about art appreciation.

If you buy this for 3,000 rupees, after 2 months it will be 30,000 rupees.

This is a craft that has been done, but there are some collectors who also collect art that can depreciate in value.

And this is what Anupam gathered. It's like, in the end, nothing is left for him because it evaporates.

This is weeks later, this is months later.

The key is to question your preconceptions.

So if someone says, "Oh, I saw that portrait," months later, it might not be that portrait.

And if they say it's solid, it's not solid, it evaporates.

And even if they say they don't understand, it's in the air, so that's not true either.

in the same gallery or in the same museum.

So they breathed it in, but they didn't notice it.

My mom and dad were watching it while I was working on it, and they said, "Why do you always talk about negative topics?"

And I thought, "What do you mean?"

"Light creates darkness and creates a self that is now evaporating.

Don't you think it has something to do with death? ’ they said.

"Of course not. In my case, this is trapped in a small solid, but the moment it evaporates, it merges with the whole," I think.

But she said, "No, I still don't like it."

As a sculptor, can you create something out of nothing? ”

I said, "No, Mom. It can't be."

Because you can collect dust to make sculptures, you can destroy sculptures to get dust, but there is nowhere to bring dust into space. ”

So I did this job for her.

Its name is "Emerging Angel".

This is day one. It just looks like one is becoming the other.

So a few days later I had the same sculpture.

This is 15/20 days later.

Air enters under the sculpture through a tiny slit between the glass box and the wood, creating another sculpture.

This gave me even more faith.

That evaporating sculpture gave me confidence that there might be more possibilities to capture the invisible.

So what you see now is called "Shadow Foreshadow".

And what I want to tell you is that we see no shadows and we see no lights. You can see the source of the light.

We can see where it bounces off, but we can't see what [they] are.

That's why the night sky looks dark, but it's always full of light.

We can see it when it bounces off the moon.

The same is true in the darkroom.

That tiny speck of dust reflects light again and we perceive its presence.

In other words, we can't see darkness, we can't see light, we can't see gravity, we can't see electricity.

So I started this work to further explore how to sculpt this object and the space in between.

Because, as a visual artist, if I see this or I see that, how do I sculpt this.

When you engrave this, you will have two reference points.

The skin of this also represents it.

And the skin on the other side also represents the floor.

I tried it as an experiment to cast a shadow.

This is a cardboard box and its shadow.

Second is the following. The moment you bring the invisible into the visible world, it has all the properties of a visible being.

That's how I got the shadow.

Then I thought, OK, let's sculpt this.

And also it becomes an object.

Throw the light again, the third one.

So what you see is just a shadow of a shadow.

And also there is no shadow at that point.

I thought, "Oh, good job. I'm done."

You can see details.

This is called "gravity".

It's called "breathing". Just two holes in the gallery wall.

It's a false wall and has a volume of about 110 cubic feet.

So this hole actually lets air in and out.

So you know where it's happening, but what's going on remains invisible.

This is from the exhibition "Invisible" held at the Talwar Gallery.

This is called "Kayam".

detailed.

And I want to tell you that our senses are very limited. We can't hear everything, we can't see everything.

We don't feel "touching the air", but if the wind is a little faster, we can feel it.

Therefore, all construction of our reality is done through these limited senses.

So my request was is there a way to use all of these as just symbols or symbols.

And to really get to the point, you have to go beyond the wall, beyond the illogical, invisible wall.

Because when you see someone walking, you see their footprints.

But if you're just trying to cut and analyze that footprint from the whole, you're missing the point. Because the actual journey takes place between those footprints, and the footprints are only the passage of time.

thank you.

(applause)

My story is a little about war.

It's about disillusionment.

It's about death.

And it's about rediscovering idealism in all its wreckage.

And perhaps there are lessons on how to deal with the messy, fragmented and dangerous world of the 21st century.

I don't believe in simple stories.

I don't believe in life and history written like these neat narratives where decision 'A' resulted in outcome 'B' which resulted in outcome 'C', where we were presented and perhaps encouraged each other.

I believe in chance. One of the reasons I believe so is that I became a diplomat by chance.

I'm colorblind.

I was born blind to most colors.

That's why I wear gray and black most of the time, and I have to take my wife with me to choose clothes.

And I've always wanted to be a fighter pilot since I was a kid.

I loved watching the planes fly over our villa in the countryside.

It was my childhood dream to become a fighter pilot.

Then I took an exam to become a pilot in the Royal Air Force, and sure enough I failed.

I can't see all the different flashing lights and I can't distinguish the colors.

So I had to choose another career, which was actually relatively easy for me. This is because I have always had a passion for international relations since my childhood.

As a child, I used to read newspapers a lot.

I was fascinated by the Cold War, the INF negotiations over intermediate-range nuclear missiles, and the proxy war between the USSR and the US.

in Angola or Afghanistan.

These things really got me interested.

So I decided from a very young age that I wanted to be a diplomat.

And then one day I announced this to my parents - and my father denies the story to this day - I said, "Dad, I want to be a diplomat."

And he turned to me and said, "Carnet, you have to be very smart to be a diplomat."

(laughs) And my ambition was sealed.

In 1989 I joined the UK Foreign Office.

That year, 5,000 people applied to become diplomats, and 20 were successful.

And as these numbers show, I was invited into an elite, glamorous and exhilarating world.

Being a diplomat was and still is a great job and I loved every moment of it and enjoyed my diplomatic position.

I bought a nice suit, put on leather-soled shoes, and reveled in my incredible access to what was happening in the world.

I have traveled to the Gaza Strip.

I was head of the Middle East Peace Process at the UK Foreign Office.

I became a speechwriter for the British Foreign Secretary.

I met Mr. Yasser Arafat.

I negotiated with Saddam's diplomats at the United Nations.

After that I traveled to Kabul and served in Afghanistan after the fall of the Taliban.

And I traveled in a C-130 transport plane, visited warlords in their mountain hideouts, and negotiated with them, surrounded by Special Forces escorts, on how to eradicate Al-Qaeda from Afghanistan. So dangerous that they themselves needed a platoon of Royal Marines to escort them.

And it was exciting, it was fun.

It was really interesting.

And it's a great cadre of people, an incredibly close-knit community of people.

And, after all, the pinnacle of my career was when I moved to New York.

Having already served in Germany, Norway and various other places, I was sent to New York as a member of the British delegation to the United Nations Security Council.

And my charge was my specialty Middle East.

So I dealt with things like the Middle East peace process and the Lockerbie issue, which I can talk about later, but above all I was responsible for Iraq and its weapons of mass destruction and the sanctions imposed on Iraq to force Iraq to disarm these weapons.

I was the UK's chief negotiator on this issue, and I was very immersed in it.

Anyway, my tour was a very exciting time.

So it was a very dramatic diplomacy.

We went through several wars while I was in New York.

For my country, I negotiated a Security Council resolution of 12 September 2001 condemning the previous day's attacks. Of course, for those of us who actually lived in New York at the time, the attack struck a deep chord.

So it was an experience that was both the best of times and the worst of times.

I lived a high life.

I worked very long hours and lived in a Union Square penthouse.

I was a single British diplomat living in New York City. You can imagine what that means.

(laughs) We had a great time.

But in 2002, when the tour ended, I decided not to go back to the job that was waiting for me in London.

Actually, I decided to take a sabbatical at New School, Bruce.

In a wordless, wordless way, I realized something was wrong with my job.

I was exhausted and indescribably disillusioned.

Then I decided to take some time off from work.

The Ministry of Foreign Affairs was very generous.

You can take these special unpaid leave (so-called unpaid leave) and not actually do any work while remaining part of your diplomatic duties.

it was good.

Finally, I decided to go to Kosovo, which was under UN administration at the time, for a secondment to the United Nations.

Two things happened in Kosovo. This also shows the randomness of life. Because these events became the two axes of my life and helped guide me to the next stage.

But they were chance events.

First, in the summer of 2004, the British government decided, somewhat reluctantly, to conduct an official inquiry into the very limited subject of the use of information on weapons of mass destruction in preparation for the war in Iraq.

And I testified in secret about the investigation.

I was steeped in information about Iraq and its weapons of mass destruction, but my testimony to the investigation said three things. The government exaggerated the information. This has been very clear in what I have read over the years.

And indeed, in our own internal assessments, it was very clear that Iraqi weapons of mass destruction were not a threat to our neighbors, much less to us.

Second, the government's disregard for all alternatives to war was, in some ways, even more discredited.

I won't go into the third reason.

But anyway, I gave that testimony and it gave me a crisis.

what was i gonna do

This testimony, in my view, was deeply critical of my colleagues and ministers who waged the war on the basis of falsehood.

So I ran into a crisis.

And this was not very good.

I kept moaning and hesitating about it, telling my patient wife over and over again, and finally decided to resign from the British Foreign Office.

I felt like there was a scene in Al Pacino's movie Insider, as you may know, after being let down by a tobacco shop, he went back to CBS and said, "No more, something's broken."

And so it was with me. i love that movie

I just felt something was broken.

In fact, I will never again be able to sit smiling with foreign ministers and prime ministers and do the things that I used to be happy to do for them.

So I ran and jumped over the edge of the cliff.

And it was a very, very unpleasant feeling.

And I started falling.

And today, that autumn has not yet stopped. It's still falling.

But in a way, I got used to that feeling.

In some ways, I much prefer that feeling to actually standing on a cliff and wondering what to do.

A second thing happened in Kosovo. I'd like to drink some water, but please forgive me.

The second thing happened in Kosovo, and it gave me an answer that I didn't have much of an answer for. That is, "What am I going to do with my life?"

i love diplomacy I have no career. I expected to be a diplomat all my life and serve my country.

I wanted to be an ambassador, my mentor, my hero, the people who were at the top of my profession, but here I left everything.

Many of my friends were still there.

I had my pension.

and i gave it up.

And what was I going to do?

And that year in Kosovo this terrible, terrible thing happened, and I saw it.

In March 2004, violent riots erupted (as they were then) throughout the province of Kosovo.

18 people died.

It was chaotic.

And to see the anarchy, to know that the police and the military (there were a lot of them) could not actually stop the rioters coming down the street, is very scary.

And the only way a mob of mobs coming down the street will stop is when they decide to stop and have enough burning and killing.

It doesn't feel very good, but I saw it.

And I have experienced it. I went through those mobs.

And I tried to stop it with my Albanian friends, but failed.

And that riot taught me something, which isn't immediately obvious and is kind of a complicated story.

But one of the reasons for the riots, which lasted for several days, was that the people of Kosovar were disenfranchised from their future.

At the time, diplomatic negotiations were taking place about Kosovo's future, but neither the Kosovar people nor the Kosovar government actually took part in the negotiations.

There was a fancy diplomatic system, a negotiation process about Kosovar's future, but Kosovars were not part of it.

And the funny thing is, they weren't happy about it.

Those riots were part of that discontent.

That wasn't the only reason, and life isn't simple, one of the reasons is stories.

It was complicated, but I wouldn't pretend it was simpler than it actually was.

But that was one of the reasons.

And that inspired me. To be precise, it inspired my wife.

She said, "Why don't you advise the people of Kosovar?"

Why not advise their government on diplomacy? ”

And Kosovars were not allowed diplomatic service.

They were not allowed to become diplomats.

They were not allowed to assist foreign offices in dealing with this extremely complex process, which has come to be known as Kosovo's Final Status Process.

That was the idea.

It was the world's first diplomatic advisory group and the origin of the independent diplomats, a non-profit organization.

And it started when I flew back from London after working at the United Nations in Kosovo.

I returned to the plane, had dinner with the Prime Minister of Kosovo, and said: "I'm proposing to come and advise on foreign policy.

i know this That's what I do. Can I come and help you? ”

And he raised me a glass of rakhi and said, "Yes, carne. Come on."

And I came to Kosovo and advised the Kosovar government.

The independent diplomat ended up advising Kosovo's third consecutive prime minister and Kosovo's multiparty negotiating team.

Kosovo became independent.

The Independent Diplomat is currently established in 5 diplomatic centers around the world and advises 7-8 countries or political bodies depending on the definition, but I am not familiar with the definition.

We are advising Northern Cypriots on how to reunify the island.

We are advising the Burmese opposition, the government of South Sudan. As you probably heard first here, South Sudan will become a new country within the next few years.

We are advising the Polisario Front in Western Sahara, which is fighting to take back its homeland from Moroccan occupation after 34 years of expropriation.

We are advising various island nations on the climate change negotiations that are likely to culminate in Copenhagen.

There's a bit of randomness here, too. Because when I was just starting out as an independent diplomat, I went to a party at the House of Lords. It's a crazy place, but when I was holding my drink like this, I bumped into a guy standing behind me.

And we started talking, and he said -- I told him what I was doing, and I told him pretty grandiose that I was going to set up an independent diplomatic mission in New York.

I was the only one there at the time, and my wife and I were heading back to New York.

And he said, "Why don't you meet my colleagues in New York?"

It turns out he worked for an innovation company called What If! Some of you have probably heard of it.

And then one thing led to another, and I ended up having a "what if!" desk. In New York when I started the Independent Diplomacy.

And if you saw

Developing new flavors of Wrigley's chewing gum and new flavors of cola really helped devising new strategies for Kosovars and Saharans in Western Sahara.

And I began to realize that there are many different methods of diplomacy. Diplomacy, like business, is a problem-solving business, but the word innovation does not exist in diplomacy. It's all a zero-sum game, real politics, an ancient organization that's been around for generations and always doing things the same way.

And in today's Independent Diplomat, I'm going to incorporate some of what I learned in "What If!"

We all sit in the same office and yell at each other across the office.

We all try to work from small laptops or move desks to change our mindset.

And we try to take advantage of naive experts who may know nothing about the countries we trade in, but know something about other things, to inject new ideas into the problems we seek to address for our clients.

Naturally, this is not easy as our clients are in difficult diplomatic situations.

I don't know, but there are some lessons to be learned from all this, both personal and political. In a way they are the same thing.

Personally, I recommend falling off a cliff because it's actually better.

And it's good to tear everything up and jump off at least once in your life.

The second is a larger lesson about today's world.

Independent diplomats are part of an emerging trend around the world that the world is becoming divided.

The meaning of the state is less than it used to be, and the power of the state is diminishing.

It means that other things are gaining power.

Others of them are called non-state actors.

They could be corporations, the mafia, friendly NGOs, whatever.

We live in a more complex and fragmented world.

If governments have less influence over the problems that affect us in the world, that means who is left to deal with the problems and who has to take greater responsibility.

we.

If you can't do that, who needs to deal with it?

We have no choice but to accept that reality.

What this means is that it is no longer enough to say that international relations, world affairs, the turmoil in Somalia or Burma are none of my business, and that the government will be fine.

I can link any of you to the Al-Shabaab militia in Somalia six steps apart.

Interestingly, ask what happens, especially if you eat fish. But the relationship is there.

We are all intimately connected.

And this is not unique to Tom Friedman, it can be proven in fact case after case.

What that means is that instead of asking politicians to do something, we have to rely on ourselves to do something.

And Independent Diplomat is the kind of example that shows this in a kind of rough way.

I don't have a clear example, but here's one. The way the world is changing is embodied in what is happening where I used to work: the United Nations Security Council.

The United Nations was established in 1945.

The charter is basically aimed at preventing conflicts between states, or interstate conflicts.

Today, 80 percent of the agenda of the UN Security Council concerns intra-state conflicts involving non-state actors: guerrillas, separatists, terrorists, if you want to call them that, people who are not normal governments, not normal states.

That is the situation in the world today.

When I realized this, and looking back at my time on the Security Council and what happened in Kosovo, I realized that many times the people most directly affected by what we were doing on the Security Council were not actually on the Security Council, or were not actually invited to speak to the Security Council, and I thought this was wrong.

Something has to be done about this.

So I started in traditional mode.

My Independent Diplomat colleagues and I have toured the UN Security Council.

We went around the 70 member states of the United Nations, Kazakhs, Ethiopians, Israelis, by name, the Secretary-General, we went to see them all and said: "This is all wrong.

It is terrible not to talk to people who are actually being harmed.

We need to institutionalize a system to actually invite Kosovars and tell them what they think.

Then you can tell me You can tell them what you think.

Sounds great. You can exchange it.

In fact, it means that you can incorporate these people's opinions into your decisions, making them more effective and lasting. ”

Super logical, you'd think.

I mean, it's incredibly logical. It's so obvious that anyone can understand it.

And of course everyone got it. Everyone said, "Yes, of course you are absolutely right.

Maybe come back in half a year. ”

And of course nothing happened. nobody did anything.

The Security Council operates today in exactly the same way as it did X years ago, when I was on the Security Council ten years ago.

So we looked at the observation that it basically failed and thought what could be done about it.

And I was afraid to spend the rest of my life lobbying for this shitty government to do its thing.

So what we're going to do is actually set up these meetings ourselves.

So now independent diplomats are in the process of setting up a meeting between the UN Security Council and the parties to the conflict that are on the agenda of the Security Council.

So we are brought to you with the Darhuli rebels, the North and South Cypriots, the rebels from Aceh, and a vast list of chaotic conflicts around the world.

And we will try to take the parties to New York and sit in a quiet room in a private environment without press coverage and actually try to explain to the members of the UN Security Council what they want, and the members of the UN Security Council to explain what they want.

There was actually a conversation that had never happened before.

And of course, with all this explained, anyone who knows politics would find this incredibly difficult. And I totally agree with you too.

Failure is very likely, but it certainly won't happen if we don't try to make it happen.

And my politics have radically changed from when I was a diplomat to today. Frankly, we believe it's the outcome that matters, not the process or technology.

Preach technology to all the Iranian demonstrators imprisoned in Tehran's political prison, where President Ahmadinejad is still in power.

Technology has not brought about political change in Iran.

You should look at the output and ask yourself, "How can I generate that particular output?"

That's politics in the 21st century, and in some ways The Independent Diplomat epitomizes the fragmentation, the change that's happening to all of us.

That's my story. thank you.

I'm a cultural omnivore and my daily commute is made possible by connecting to my iPod. Your iPod has Wagner, Mozart, pop diva Christina Aguilera, country singer Josh Turner, gangsta rap artist Kirk Franklin, concertos, symphonies, and more.

I am a voracious reader, dealing with everything from Ian McEwan to Stephanie Meyer.

I read the Twilight tetralogy.

And those who live for home theaters, DVDs, video on demand, and home theaters that watch a lot of TV.

For me, LAW & ORDER: SVU, Tina Fey, 30 ROCK, Judge Judy - "People are real, cases are real, verdicts are final."

(Laughter) Now, while I'm sure many of you probably share my passion, especially my passion for "Judge Judy," and will fight anyone who tries to take her away from us, I'm a little less convinced that you share the core passion of my life, the raw professional performing arts, the performing arts that represent the orchestral repertoire, yes of course jazz, modern dance, opera, theater, and more and more.

Frankly, this is an area that many of us who work in it fear is at stake and may be dismantled by technology.

We initially touted the Internet as a great new marketing tool that would solve all our problems, but now we realize that it is rather too effective in that regard.

Depending on who is reading it, arts groups and artists trying to grab the attention of potential ticket buyers are competing with 3-5,000 different marketing messages that the average public sees every day.

In fact, we now know that technology is our biggest competitor for leisure time.

Five years ago, Gen X spent 20.7 hours online and on TV, the majority of which was on TV.

General Yers put in even more time, at 23.8 hours, most of which was online.

And today, the typical college entrant has already spent 20,000 hours online and another 10,000 hours playing video games to get to college. This is a stark reminder that we operate in a cultural context where video games have outsold music and film recordings combined.

Furthermore, I worry that technology is changing our very assumptions about cultural consumption.

We believe that thanks to the Internet, we can always get what we want and have it delivered to our doorstep.

We can shop at 3:00 in the morning or 8:00 at night and order jeans that are made for our unique body types.

With set times and venues, and attendant inconveniences such as travel and parking, live performing arts simply fail to meet expectations of personalization and customization.

And we all feel it. In the future, what does it mean to pay someone $100 to buy a ticket to a symphony, opera, or ballet when cultural consumers are accustomed to downloading songs on the Internet for 99 cents or for free 24 hours a day?

These are big questions for those of us working in this field.

But just as they feel special towards us, we know we are not alone.

We are all engaged in a catastrophic and fundamental restructuring of culture and communication, a restructuring that is destabilizing and devastating the newspaper industry, the magazine industry, the book and publishing industry, and more.

We enter the performing arts through antiquated union agreements that forbid and often prohibit mechanical duplication and streaming, we are trapped in mass facilities designed to cement the ideal relationship between the most deserving 19th century artist and audience, we are trapped in a business model that relies on high ticket revenues, where we charge exorbitant fees.

Many of us have been shaken by the demise of Tower Records and are asking ourselves, "Are we next?"

Everyone I speak to in the performing arts resonates with what Adrian Rich wrote in Dreams of a Common Language: "We are in a country with no language and no law.

Whatever we do together is pure invention.

The map they gave us has been out of date for many years. ”

And art lovers, wouldn't it be nice to invite you here to brighten up your day?

(Laughter) (Applause) Now, rather than say that we are on the brink of extinction, we would rather believe that we are engaged in a fundamental reform, a reformation like the 16th-century Reformation.

Like the Reformation, the Art Reformation was partly driven by technology, and indeed the printing press spearheaded the Reformation.

Both reforms were premised on intense debates, internal self-doubts, and a massive realignment of outdated business models.

And I think both reforms essentially begged the question of who had the right to implement them.

How do they have the right to practice?

And indeed, do we need someone to intervene in order to have a spiritual experience with God?

Chris Anderson, I believe you all know, was the first person to understand a lot of this for me, as editor-in-chief of Wired magazine and author of The Long Tail.

He wrote long ago that for the first time in human history, the means of artistic production were democratized thanks to inventions such as the Internet, web technology, and mini-cameras.

In the 1930s, if you wanted to make a movie, you had to work for Warner Bros. or RKO. Because who can afford a movie set, lighting equipment, editing equipment, music production, etc.?

And now, in this room, who doesn't know that the 14-year-old is working hard on his second, third, and fourth films?

(Laughter) Similarly, the means of distribution of art has also been democratized for the first time in human history.

Again, Warner Bros., RKO did it in the 1930s.

Well, visit YouTube and Facebook. Broadcast worldwide without leaving the privacy of your own bedroom.

This dual impact has sparked a massive redefinition of the cultural marketplace, ushering in an era where everyone is a potential writer.

Frankly, what we're seeing in this environment right now is a big era in which the entire world is changing from an era when audience numbers plummeted.

But the number of people participating in the arts, writing poetry, singing songs, and performing in church choirs has exploded beyond our wildest imagination.

This and other groups are called Pro-Am and are amateur artists doing professional-level work.

You often see it on YouTube, dance contests, film festivals, etc.

They radically expand our notions of the possibilities of aesthetic vocabulary, while also challenging and undermining the cultural autonomy of our traditional institutions.

After all, we now live in a world defined by participation rather than consumption.

But let me be clear, just as the Reformation did not put an end to formal churches and priesthoods. We believe our arts institutions will continue to be important in the future.

Today, for artists, these are the best opportunities to live a life of economic dignity, not luxury or dignity.

And they are where artists who deserve and want to operate on a scale find a place.

However, it is too short-sighted to think of them as synonymous with the art community as a whole.

In fact, we tend to polarize amateurs and professionals, but the most exciting development in the last 5-10 years is the rise of professional hybrid artists, those who work primarily outside of concert halls and stages. Most frequently, however, it concerns women's rights and human rights, global warming and AIDS relief, not out of economic necessity, but out of a deeply organic belief that the work required of one cannot be accomplished in a traditional closed-art environment.

The world of dance today is defined not only by the Royal Winnipeg Ballet or the National Ballet of Canada, but by Liz Larman's Dance Exchange. Liz Luhrmann's Dance Exchange is a multigenerational professional dance company with dancers aged 18 to 82, collaborating with genomic scientists who embody DNA strands and nuclear physicists at CERN.

The professional theater community today helps support not only the Shaw and Stratford festivals, but also the existence of self-residences at the Artist's Cornerstone Theatre, Baha'i, Catholic, Muslim, Jewish, Native American, Native American, Gay, and Residency residences that have brought together 10 different religious communities since 9/11. The first step towards community cross healing.

Contemporary performers such as Lodessa Jones work in women's prisons, helping female inmates articulate the pain of imprisonment, while contemporary playwrights and directors work with youth gangs to explore alternative routes to violence and more.

And in fact, I think we are on the verge of a time when the performing arts will become more important than ever, rather than extinct.

You know, we've long said it's important to the health of your town's economic community.

And absolutely, I want you to know that every dollar spent in your community on performing arts tickets creates an additional $5-7 in the local economy in dollars spent on restaurants, parking lots, fabric stores buying fabrics for costumes, piano tuners tuning musical instruments, and so on.

But art will become more important to the economy as we move forward, especially in industries we can't even imagine yet. Just as art was at the heart of the iPod and computer game industries, few could have foreseen it 10 or 15 years ago.

Business leadership will increasingly rely on emotional intelligence—the ability to listen deeply, empathize, articulate change, and motivate others—exactly what the arts cultivate with each encounter.

Especially now we have to face the fallacy that we are all market oriented without the influence of social conscience. We must seize and celebrate the power of art to shape the character of individuals and nations, especially those of young people who are too often exposed to sensory shocks rather than digested experiences.

After all, especially in this world now, we live in the context of regressive and cumbersome immigration law, in television that thrives on real-life humiliation, and in the context of analytics, and the most recurring line in the United States, day after day, at every station, every bus stop, every plane platform, is, "Ladies and gentlemen, please report any suspicious activity or suspicious person to your nearest authority," and in all these ways we are encouraged to view our fellowmen with hostility, fear and deceit. , temptation and suspicion.

Whatever art does, it invites us to look with generosity and curiosity to the same people each time it calls us.

God knows that if we have needed that ability in human history, we need it now.

As you know, I believe we are united not by technology, entertainment or design, but by common purpose.

We work to promote healthy and vibrant societies, ameliorate human suffering and promote a more thoughtful, substantive and empathetic world order.

I salute all of you as activists in that quest, and urge you to embrace and value art in your work, whatever your purpose.

The Doris Duke Charitable Foundation is committed to extending a hand of friendship now and for years to come.

And thank you for listening to me so kindly and patiently this afternoon.

If we really want to understand the ocean problems we face, we need to think about physics as much as we think about biology.

We cannot solve the problem unless we begin to study the ocean in a more interdisciplinary way.

So I would like to demonstrate that through a discussion of some of the climate changes that are happening in the ocean.

Look at sea level rise.

Let's take a look at ocean warming.

And last on the list is ocean acidification. If you ask me, you know, "What are you most worried about?"

What are you afraid of? ”

For me it's ocean acidification.

And this only recently appeared on the stage.

So, at the end, we will have a little time.

Like many of you in this room, I was in Copenhagen in December.

And we all agree that it was both an eye-opening experience and a very frustrating experience.

I once sat in this big negotiating room for three or four hours and never once heard the word "sea."

It didn't show up on the radar screen.

The countries that brought up this issue when we gave national leaders' speeches were often the leaders of small island states, low-lying island states.

And many low-lying countries, such as Kiribati and Nauru, end up sitting at the end of this very long line due to the strange alphabetical quirks of the countries.

They were marginalized at the negotiating table.

One problem is finding the right target.

It's not clear what to target.

And if you don't have a clear goal, how can you find a way to solve the problem?

Well, you've probably heard of "twice". It means that the temperature rise should be kept below 2 degrees.

However, there is not much scientific basis behind this number.

I also talked about the concentration of carbon dioxide in the atmosphere.

Should it be 450? Should it be 400?

There isn't much scientific backing for this either.

Most of the science behind these numbers—potential targets—is based on research on land.

And for those who work at sea and think about what their goals should be, we argue that the goals must be lower.

From a marine perspective, 450 is too high.

Now we have strong evidence that it really needs to be 350.

There is currently 390 ppm CO2 in the atmosphere.

You're not going to brake in time to stop at 450 degrees, so you have to accept that overshoot will happen. Future discussion should focus on how far the overshoot lasts and what the path back to 350 degrees will be.

Now, why is this so complicated?

Want to know a little more about these things?

The problem is that there are very complex forces at work in the climate system.

Climate change has all kinds of natural causes.

There is an interaction of sky and sea.

Here in the Galapagos, we are affected by El Niño and La Niña phenomena.

However, when a large El Niño event occurs, the entire planet warms.

Volcanoes emit aerosols into the atmosphere.

It changes our climate.

The ocean contains most of the exchangeable heat on earth.

So anything that affects how surface and deep ocean waters mix will change the Earth's oceans.

And we also know that the output of the sun is not constant over time.

So they are all natural causes of climate change.

And there are also causes of man-made climate change.

We are changing the properties of the surface of the land, i.e. the reflectance.

We inject aerosols into the atmosphere ourselves, and there are not only carbon dioxide, but trace gases such as methane, ozone, sulfur oxides, and nitrogen.

So here comes the problem. Sounds like a simple question.

Is CO2 produced by human activity warming the planet?

But to answer that question, we need to know something about the drivers of all these changes in order to define the cause of carbon dioxide.

But actually we know a lot about them all.

As you know, thousands of scientists have worked to understand all of these man-made and natural causes.

And we can solve it and say, "Yes, CO2 is warming the planet."

There are many ways to study natural variability today.

Here are some examples.

This is the ship I spent the last three months in Antarctica.

A scientific drilling ship.

We go out for months at a time, drilling into the ocean floor to retrieve sediments that tell the story of climate change.

One way to understand the future of our greenhouses is to drill down to the last period when CO2 was twice what it is today.

And that's what we did with this ship.

This is—this is south of the Antarctic Circle.

It looks really tropical there.

One day when the sea was calm and the sun was shining, we were able to get off the ship.

Most of the time it was like this.

There were waves up to 50 feet.

Winds average about 40 knots for most of the voyage, with a maximum of 70 or 80 knots.

That trip has just ended and I can't show you much of the results right now, but it's going to take us back another year to another drilling expedition I'm on.

It was led by Ross Powell and Tim Naish.

Andoril project.

And we drilled the first borehole in the largest floating ice shelf on Earth.

This is crazy. This large drilling rig is dug in blankets to keep everyone warm and drilling in temperatures of minus 40 degrees Celsius.

We also drilled in the Ross Sea.

To the right of it is the Ross Sea Ice Shelf.

So this giant floating ice shelf, about the size of Alaska, came from West Antarctica.

West Antarctica is now part of a continent, with ice grounding to the seafloor as deep as 2,000 meters.

That is, the ice sheet is partially floating and exposed to the sea, to the heat of the sea.

This is the part of Antarctica that concerns us.

It's partially floating, so as you can imagine, the sea level could rise a bit and the ice could lift off the bottom and then break off and float north.

When the ice melts, the sea level rises by 6 meters.

So we went back in time to see exactly how often that happened and how fast the ice melted.

Here is the cartoon on the left.

It penetrated 100 meters of floating ice shelf, then 900 meters of water depth, and drilled further to 1,300 meters of sea floor.

So this is the deepest geological borehole ever drilled.

It took about ten years to put this project together.

And this is what we found.

There are currently 40 scientists working on this project, performing all kinds of very complex and expensive analyses.

But in the end, it turned out that it was this simple visual description that told the best story.

You know, I confirmed this when the core sample came out.

We observed alternating deposits of this kind. There is gravel and cobbles there and lots of sand.

It is deep sea matter.

It can only be reached if carried by ice.

So you can see that there is an ice shelf overhead.

And it alternates with deposits like:

This is really beautiful.

This sediment consists of 100% microscopic plant shells.

And since these plants need sunlight, you'll know there's no ice overhead when you find sediment.

And we observed about 35 alternations between gravel and these plant sediments, between open water and ice-covered water.

What this means is that in the Ross Sea region, this ice shelf melted about 35 times to form anew.

And this is for the last four million years.

This was totally unexpected.

No one expected the West Antarctic ice sheet to be so dynamic.

In fact, the long-standing myth was that ice formed tens of millions of years ago and has been there ever since.

And now we know that it recently melted and re-formed, causing sea levels to rise and fall six meters at a time.

What could be the cause?

Well, there is no doubt that the tiny changes in the amount of sunlight reaching Antarctica are caused by natural changes in the Earth's orbit.

But here's the important thing. As you know, another thing we know is that the ice sheet has crossed the threshold and the planet has warmed up enough. That number is about 1 to 1.5 degrees Celsius. The planet warms up enough to...

That ice sheet became very dynamic and melted very easily.

And what do you know?

In fact, we've changed temperatures just the right amount over the past century.

Many of us now believe that West Antarctica, the West Antarctic Ice Sheet, is beginning to melt.

Sea levels are expected to rise by one to two meters by the end of this century.

And it can be bigger than that.

This is a serious consequence for a country like Kiribati, whose average altitude is just over one meter above sea level.

Well, the second story takes place here in the Galapagos.

This is bleached coral, dead coral from the 1982-83 El Niño event.

This is from Champion Island.

A colony of Pavona Crabs about 1 meter high.

and covered with algae. That kind of thing happens.

As soon as these things die, living things come in and live on their dead surfaces.

So when an El Niño event destroys a coral colony, it leaves this indelible record.

After that, go coral watching and find out how often you see coral.

So one of the ideas in the '80s was to go back and nucleate coral heads across the Galapagos Islands to see how often catastrophic events occurred.

As you know, El Niño killed 95 percent of all corals here in the Galapagos in 1982-1983.

Similar mortality rates followed in 1997-1998.

And when we go back two to four hundred years, we find that these are unique events.

No other mass fatalities were observed.

So our recent past events are truly unique.

In other words, they are either just monster El Niños, or very strong El Niños with global warming in the background.

Either way, it's bad news for corals in the Galapagos Islands.

Here's how the coral was sampled:

This is actually Easter Island. Look at this monster

This coral is 8 meters high.

And it continued to grow for about 600 years.

Well, Sylvia Earle told me about this very same coral.

And she was diving here with John Lorre -- I think it was 1994 -- and she collected a little chunk and sent it to me.

And so we started working on it, thinking that by analyzing corals like this, we could learn about ancient ocean temperatures.

I have a diamond drill for that.

We are not killing colonies. A small core sample is taken from the top.

The core appears as these cylindrical tubes of limestone.

The material is then brought back to the lab for analysis.

Part of the coral core is visible on the right.

I've done it all over the Eastern Pacific.

Similar efforts are underway in the Western Pacific.

Take me back to the Galapagos Islands.

And we've been working on this fascinating ridge here in Urbina Bay.

During the 1954 earthquake, this ocean terrace rapidly rose from the sea, rising about six to seven meters.

Now you can walk on the reef without getting wet.

When you go to the ground there, it looks like this, this is Grandpa Coral.

It is 11 meters in diameter and is known to have started growing in 1584.

Imagine.

And the coral was growing well in shallow water until an earthquake struck in 1954.

Now, the reason we know it's 1584 is that these corals have growth zones.

If you cut them and slice the core in half and take an X-ray, you can see the bright and dark bands.

Each is one year.

It has been found that these corals grow about one centimeter in one and a half years.

And we are counting on the bottom.

And another of their qualities is that they have great chemistry.

You can analyze the carbonates that make up corals, and there's a lot you can do.

However, in this case, we measured different isotopes of oxygen.

Their ratio tells us the water temperature.

In this example, we were monitoring this reef in the Galapagos with a temperature recorder, so we knew the temperature of the water in which the corals were growing.

If you measure this ratio after collecting the corals, you will find that these curves match perfectly.

In this case, on these islands, corals act like instruments that record changes in the water.

And of course, our thermometer here only takes us back in time about 50 years.

Corals take us back hundreds and thousands of years.

So what we're doing is merging a lot of different datasets.

It's not just my group. There are probably 30 groups around the world doing this.

However, we have obtained instrument-level or near-instrument-level records of temperature change going back several hundred years and have compiled them.

Here is a composite diagram.

Here we have a series of curves.

But what's going on is that we're looking at the temperature on Earth over the last 1,000 years.

There are 5-6 different compilations out there, but each of those compilations reflects input from hundreds of records of this type taken from corals.

Do the same with ice cores.

We are in the business of dealing with tree rings.

In doing so, we discover what is truly natural and how different it was from the last century, right?

I chose this one because it looks complicated and dirty.

This is very annoying.

You can see there are some signals there.

Some records show cooler temperatures than others.

Some of them show greater variability.

But they all tell us what natural variation is.

Some of them are from the northern hemisphere. Some come from all over the planet.

But what we can say here is that the earth has cooled in the last 1000 years.

Cooling continued until about 1900.

And then there are natural variability due to the sun caused by the El Niño phenomenon.

Century-scale, decadal-scale fluctuations, and we know how big they are. 2 to 40 degrees Celsius, about 2/20ths of a degree Celsius.

But finally a black instrumental record is completed.

Temperatures in 2009 are even higher.

As you know, we warmed the earth by about 1 degree in the last century, but the natural part of the record shows nothing similar to what we saw in the last century.

You know, that's the strength of our argument, that we're doing something really different.

I would like to conclude with a brief discussion of ocean acidification.

I like to tell this story as an element of global change. Because even if you're a staunch skeptic about global warming and I talk to that community often, you can't deny the simple physics of CO2 melting into the ocean.

As you know, we emit large amounts of CO2 into the atmosphere from fossil fuels and cement production.

About one-third of the carbon dioxide is currently dissolved in the ocean.

And as it progresses, the oceans become more acidic.

Therefore, it cannot be disputed.

That is what is happening now, and it is a completely different problem than the global warming problem.

It has many effects.

Carbonate organisms are also affected.

Many organisms, both plants and animals, use calcium carbonate for their shells.

The main skeletal material of coral reefs is calcium carbonate.

The material dissolves well in acidic fluids.

So one of the things we're seeing is that organisms need to expend more metabolic energy to build and maintain their shells.

As this transient phenomenon, CO2 uptake in the ocean, continues, at some point the material actually begins to dissolve.

And coral reefs, where some of the major skeletal organisms will disappear, will experience a significant loss of marine biodiversity.

But it's not just carbonate producers that are affected.

There are many physiological processes affected by ocean acidity.

Many reactions involving enzymes and proteins are sensitive to marine acid content.

So all this - increased metabolic demand, decreased reproductive success, altered respiration and metabolism.

As you know, these are the ones with good physiological reasons to expect them to be caused by this temporary stress.

So we've come up with some very interesting ways to track atmospheric CO2 levels back millions of years.

We've done that before using ice cores only, but in this case we're going back 20 million years.

Taking a sample of the sediment will tell you the CO2 level in the ocean, which in turn tells you the CO2 level in the atmosphere.

And the problem is that to find out when CO2 levels reached their current levels, we need to go back to about 15 million years ago.

To find a time when CO2 levels were twice what they are today, we need to go back to about 30 million years ago.

What this means is that all life in the ocean evolved in this chemically controlled ocean with lower CO2 levels than today.

That is why they are unable to respond or adapt to this rapid acidification that is now underway.

Charlie Bellon issued the following statement last year: "The prospect of ocean acidification may be the most serious of all projected consequences of anthropogenic carbon dioxide emissions."

I think that's probably true, so I'll stop there.

Protected areas are definitely necessary, but for the sake of the oceans, we need to cap or limit CO2 emissions as soon as possible.

thank you very much.

(applause)

At least I discovered what environments we expose our speakers to: sweaty palms, sleepless nights, and a totally unnatural fear of watches.

I mean, pretty brutal.

And I'm a little nervous about this too.

Nine billion humans come to us.

Well, even the most optimistic dreams can be dashed by the prospect of people looting the planet.

But lately I've been interested in other ways of thinking about large human groups. Because they have situations where they can do really great things.

I believe this is a phenomenon that can be used by any organization or individual.

It certainly affected how we think about the future of TED, and perhaps the world at large.

So let's explore.

The story begins with one child acting a little strange.

This kid is known online as Lil Demon.

He's doing tricks, dance tricks here, which is probably something no 6-year-old has ever accomplished before in history.

how did he learn them?

And what drove him to spend hundreds of hours practicing?

Here are some tips.

(Video) Lil Demon: ♫ Step up your game. oh. oh. ♫ ♫ Step up your game. oh. oh. ♫ Chris Anderson: So it was sent to me by a filmmaker named Jonathan Chu, who said it was the moment he realized dance was evolving because of the internet.

Here's what he said at TED in February.

Essentially, dancers were challenging each other online to get better. Incredible new dance skills were being invented. A 6-year-old was also involved.

It felt like a revolution.

Then John came up with a great idea. He gathered the best dancers from YouTube to found this dance collective, The League of Extraordinary Dancers, LXD.

I mean, these kids were web-taught, but they were so good they could have played at this year's Oscars.

And at TED here in February, their passion and brilliance took our breath away.

So this story of the evolution of dance seems strangely familiar.

As you know, some time after TEDTalks started to take off, we noticed that speakers started spending a lot of time preparing.

The result is incredible new conversations like these two.

... months of preparation packed into 18 minutes, brutally raising the bar for the next generation of speakers, and the effect is visible this week.

It's like J.J. In fact, Jill ended the story by saying, "Try harder," but maybe that's better.

So, in both cases, people are watching web videos, and that's what drives the cycle of improvement.

What is going on here?

Well, I think this is the latest iteration of what you might call "crowd-accelerated innovation."

Only three things are needed to get this activity up and running.

Think of these as three dials on a giant wheel.

Raise the dial and the wheel will start spinning.

And the first thing you need is... a crowd, a group of people who share a common interest.

The bigger the crowd, the more potential innovators there are.

That's important, but the reality is that most people in the crowd have these other roles.

They are building an ecosystem where innovation is born.

The next thing we need is light.

We need a clear and open visualization of what the smartest people in that crowd can do. Because that way, you can learn how you are empowered to participate.

And thirdly, you need desire.

As you know, innovation requires a lot of effort.

It is based on hundreds of hours of research and practice.

Without desire, nothing happens.

Here's an example of this pre-internet machine in action.

The dancers on the street corner, it's a crowd, it's a small one, but they all obviously know what each other can do.

And the desire part, I think, comes from social status, right?

The best dancers walk with pride and have the best dates.

Perhaps some innovation will happen here.

But on the web, all three dials are ratcheted on top.

The dance community is now global.

Millions of people are connected.

And amazingly, the crowd itself shines a light on them, directly through comments, ratings, emails, Facebook, Twitter, or indirectly through views and links that take Google there, so you know what the best people are capable of.

So it's easy to find a good one, and when you do find it, you can repeatedly look it up close and read what hundreds of people have written about it.

Very bright, isn't it?

But the desire factor is actually very large.

I mean, you might just be a kid with a webcam, but if you can do something that goes viral, you'll get the attention of the equivalent of a packed sports stadium.

Hundreds of strangers are excitedly writing about you.

Even if it's not that eloquent, and it really isn't, it can still really enhance your day.

So I think the possibility of this new type of global recognition is pushing a lot of effort.

And it's important to note that stars aren't the only ones benefiting. Everyone can learn because they can see the best.

Also, the system is self-lubricating.

It is the crowd that illuminates the light and fuels desire, but light and desire are a deadly one-two combination that attracts new people to the crowd.

It is, therefore, a model that almost any organization can use to cultivate its own cycle of crowd-accelerated innovation.

Invite the crowd, let in the light, and raise your desires.

And the hardest part about it is probably the light. Because it means you have to open your mind and show the world what you have.

By exposing what you consider your deepest secrets, perhaps millions of people can gain the power to improve it.

And, much to my delight, there is one layer where this tool can't really be leveraged.

The dark side of the web is allergic to light.

For example, I don't think you'll ever see terrorists publish their plans online and say to the world, "Now can you help me actually carry out my plans?"

However, you can publish your work online.

And if you can turn the steering wheel, watch out.

So at TED, I became a little obsessed with this idea of ​​openness.

In fact, my colleague June Cohen chose to call it “radical openness” because it is always beneficial to us.

We opened our talks to the world, and suddenly millions of people were willing to help spread the speaker's ideas, making it easier to recruit and motivate the next generation of speakers.

Thousands of heroic volunteers have joined us in making our translation program public. Some of them are watching online right now. Thank you! -- We've translated our talks into over 70 languages, which has tripled our audience in non-English speaking countries.

With the transfer of the TEDx brand, suddenly there are more than 1,000 live experiments in the art of spreading ideas.

And these organizers are meeting each other and learning from each other.

we are learning from them.

We're getting great feedback from them.

The wheels are spinning.

Now, let's go back for a minute.

So the idea that innovation comes from groups is nothing new to me.

You know, we heard it this week - this romantic notion of a lone genius with "Eureka"! World-changing moments are misleading.

He said so, and you know.

we are a social species.

We spark each other.

That the Internet has accelerated innovation is nothing new either.

Over the past 15 years, a strong community has been connecting online and sparking each other.

If you're a programmer, you'll find the entire open source movement to be a great example of crowd-accelerated innovation.

But the point here is that these groups were able to connect because the deliverables of their work were the kind that could easily be shared digitally: photos, music files, software.

That's why what I'm excited about, and what I think is underreported, is the importance of the rise of online video.

This is the technology that enables the digital sharing of global talent, thereby starting a whole new cycle of crowd-accelerated innovation.

In the first few years of the web, there were few videos for the following reasons. Video files are huge. The web couldn't handle them.

But over the last decade, bandwidth has exploded 100x.

I came here suddenly.

Humans watch 80 million hours of YouTube every day.

In fact, Cisco estimates that over 90 percent of web data will be video within four years.

Puppies and porn and piracy alone would kill us.

I don't think so.

Video is high bandwidth for a reason.

There's an enormous amount of data packed into it, and our brains are uniquely wired to decipher it.

Today, I would like to introduce you to Sam Harbour.

he is a unicycle

Before YouTube came along, there was no way for him to discover his sport's true potential. Because it cannot be expressed in words.

But watching a video clip posted by a stranger opens up a world of possibilities for him.

Suddenly he begins to imitate and innovate.

And a global community of unicyclists discover each other online and inspire one another to greatness.

And there are thousands of other examples of this happening, evolving skills with video, from physical to artistic.

As a former hobbyist magazine publisher, I must say I found this oddly beautiful.

I mean, there's a lot of passion in this screen.

But if Rube Goldberg machines and video poetry aren't your thing, then this is it.

Jove is a website founded to encourage scientists to publish their peer-reviewed research on video.

There are problems with traditional scientific papers.

It can take months for scientists in different labs to figure out how to reproduce experiments described in print.

Here's one such frustrated scientist: Moshe Pritzker, the founder of Jove.

He told me the world wasted billions of dollars on this.

But watch this video.

In other words, if you can show, not just explain, that problem will be solved.

So it's not far-fetched to say that at some point online video will dramatically accelerate scientific progress.

Here's another of the most familiar examples from TED. Video can be more powerful than print. It's about sharing ideas.

Why do people like watching TEDTalks?

All those ideas are already in print.

It's actually faster to read than to display.

Why would anyone bother?

Well, there are things to show as well as to tell.

But even away from the screen, more is being transferred than just words.

And there's some serious magic in that non-verbal part.

Somewhere hidden in your physical gestures, the rhythm of your voice, your facial expressions, your eye contact, your passion, your awkward British body language, your sense of audience response, there are hundreds of subconscious cues that determine how much you can understand and whether you can be inspired -- light, if you want, and desire.

Incredibly, all this can be conveyed on just a few square inches of screen.

Reading and writing is actually a relatively recent invention.

Face-to-face communication has been fine-tuned through millions of years of evolution.

That's what made it this mysterious and powerful thing.

When someone speaks, a resonance occurs across the receiving brain, and the whole group acts together.

So this is the connective tissue of the human super-organism in action.

Perhaps that's what has driven our culture for thousands of years.

500 years ago, we encountered a rival with a fatal advantage.

here.

Scale and print.

The world's ambitious innovators and influencers were allowed to spread their ideas far and wide, and the art of the spoken word almost died out as a result.

But now, in the blink of an eye, the game has changed again.

It's no exaggeration to say that what Gutenberg did for writing is what online video can do for face-to-face communication.

I mean, that primal medium your brain is exquisitely wired for...

It just went global.

Well this is big.

We may need to reinvent ancient art forms.

So today, one person giving a speech can be seen by millions, shining a bright light on powerful ideas and creating a strong desire to learn, a strong desire to respond, and in his case, a strong desire to laugh.

For the first time in human history, talented students no longer have to have their potential and dreams erased from history by poor teachers.

They can sit two feet in front of the best players in the world.

Well, TED is just a small part of it.

In other words, universities around the world are opening up their curricula.

Thousands of individuals and organizations share knowledge and data online.

Thousands of people are finding new ways to learn, finding ways to keep up with what matters, and completing the cycle.

So as I've been thinking about this, it's become clear what the next step in the evolution of TED should be.

TEDTalks should not be a one-to-many one-way process.

Our future is many-to-many.

So we dream of ways to make it easier for everyone in the global TED community to respond to speakers, contribute their ideas, and even their own TEDTalks, and shine a light on the best of what's out there.

Because if you can lather the best out of a very large pool, this wheel will spin.

Now, is it possible to imagine a process similar to this taking place across global education?

So, do we really need such a painful top-down process?

Why not start a self-fueling cycle that we can all participate in?

Are you old enough to participate?

Schools cannot be siled.

I can't stop learning when I'm 21.

If in a crowd of nine billion people...

What if that crowd could learn enough to become net contributors instead of net looters?

Will it change everything?

This means that we will need more teachers than ever before.

But the good news is they are there.

They are in the crowd, the crowd has the lights on, and for the first time we can see them not as an undifferentiated mass of strangers, but as individuals we can learn from.

who is the teacher?

you are a teacher

You are part of the crowd about to launch the greatest learning cycle in human history – a cycle that can take us all to a smarter, smarter, more beautiful place.

This is a group of children from a Pakistani village near where I grew up.

In five years each of these children will have access to a mobile phone capable of watching full web videos and uploading videos to the web.

I mean, is it crazy to think that this girl in the back on the right side might be sharing the idea of ​​keeping the world beautiful for your grandchildren in 15 years?

It's not crazy. It's actually happening now.

I would like to introduce my best friend at TED. He happens to live in Africa's largest slum.

(Video) Christopher McCaw: Hello. My name is Christopher Makaw.

I am one of the organizers of TEDxKibera.

A lot of good things are happening here in Kibera.

We have a self-help group.

They turned the dumpster into a garden.

The same place was the crime scene of the robbery.

They used the same garbage to make green manure.

We feed over 30 families at the same dump.

We have our own film school.

They use flip cameras to record, edit and report to their own channel, Kibera TV.

Due to the scarcity of land, we use bags to grow our vegetables, which also saves our living costs.

Seeing things from a different perspective makes a difference.

Today, I see Kibera in a different light.

My message to TEDGlobal and the world is: Kibera is a hotbed of innovation and ideas.

(Applause) CA: You know?

I think Chris has always been an inspirational person.

The new thing, and it's a huge thing, is that for the first time we can see him and he can see us.

Now Chris and Kevin, Denise and Dixon and their friends are watching us in Nairobi.

Ladies and gentlemen, I learned from you today.

thank you.

And thank you.

(applause)

Let's start with day and night.

Life evolved under conditions of light and darkness, light and darkness.

Plants and animals have developed their own biological clocks to respond to changes in light.

These are chemical clocks and are found in all known organisms with two or more cells and in organisms with only one cell.

Let's take an example. A horseshoe crab can be plucked from a beach, flung all the way across the continent, dropped into a sloping cage, and when the tide comes in on its home coast, it will climb the floor of the cage and trot down again as soon as the water recedes thousands of miles away.

This goes on for weeks, gradually losing plot.

It's incredible to see, but nothing psychic or paranormal is happening. It's just that these crabs usually have internal cycles that correspond to what's going on around them.

So we have this ability too.

And in humans it is called the "body clock".

This is best seen when you take someone's watch and lock it in a deep underground bunker for months. (Laughter) Some people actually volunteer for this, and they usually kind of rave about their productive time in the hole.

So no matter how atypical these subjects should be, they all point to the same thing.

They wake up a little bit later every day, say 15 minutes later, and they've been floating like this 24 hours a day for weeks.

In this way, they know that they are working with their own body clock rather than somehow perceiving the day outside.

Well, it turns out that we have a body clock and it is very important in our lives.

I think it's a huge driving force in culture and the most underestimated force in our actions.

We evolved as an equatorial species, so we are very well equipped to deal with 12 hours of daylight and 12 hours of darkness.

But, of course, we are spread across the globe, and in Arctic Canada, where I live, there is perpetual light in the summer, but 24 hours of darkness in the winter.

In other words, this northern indigenous culture has traditionally been very seasonal.

In winter, a lot of sleep continues. You are enjoying family life at home.

And in the summer they become very active, with almost manic hunting and very long working hours.

So what would our natural rhythm look like?

What does our sleep pattern look like in an ideal sense?

Well, it turns out that people go to bed twice every night when they live without any artificial light.

They go to bed around 8pm.

Sleep until midnight and again from about 2am until sunrise.

And in between, spend a few hours in bed in a kind of meditative silence.

And at this time there is a surge of prolactin that is never seen in modern times.

People who participated in these studies reported feeling awake during the day and found themselves experiencing true awakening for the first time in their lives.

So let's get down to modern times.

We live in a culture of jet lag, global travel, 24/7, and shift work.

There are advantages to our modern way of doing things, but I think we also need to understand the costs.

thank you.

(applause)

Over the past decade, I've spent time figuring out how and why humans form social networks.

And the kind of social network I'm talking about isn't the kind online these days, but rather the kind that humans have been building over hundreds of thousands of years since they emerged from the African savannah.

Therefore, I form friendships, co-workers, brothers, and relatives with other people, and those people have similar relationships with other people.

And it spreads far and wide.

And you'll get a network like this:

All points are people.

Every line between them represents a relationship between two people, different kinds of relationships.

And then you can have this kind of vast human fabric in which we are all embedded.

And my colleague James Fowler and I have been studying for quite some time what are the mathematical, social, biological and psychological rules that govern how these networks are put together, and similar rules that govern how they operate and how they affect our lives.

But lately, I wonder if we can use this insight to find ways to not just understand things, but actually improve the world, or make something better, or actually fix things.

So one of the first things we thought we would tackle was how to predict trends.

And the current state-of-the-art to predict epidemics, if you're the CDC or any other national agency, is to sit in the middle of where you are and collect data from field doctors and laboratories reporting the prevalence and incidence of certain conditions.

This or that patient is being diagnosed with some disease, and other patients are being diagnosed, and all this data is entering, albeit with some lag, into a central repository.

And if all goes well, a week or two from now we'll know where today's epidemic was.

In fact, about a year ago, when it came to flu, the idea of ​​Google Flu Trends was announced. By looking at people's search behavior today, we could find out where the flu is happening, how epidemics are today, and how prevalent the current epidemic is.

But what I want to show you today is a way to not only receive quick warnings about epidemics, but actually detect them early.

And in fact, this idea can be used not only to predict bacterial epidemics, but to predict any kind of epidemic.

For example, anything that spreads in the form of social contagion can be understood in this way, from left-wing abstract concepts such as patriotism, altruism, and religion, to things like diet behavior, book-buying, drinking, bicycle helmets and other safety habits, products people might buy, and electronics purchases, all of which spread in the form of social contagion.

The diffusion of certain types of innovation can be understood and predicted by the mechanisms we will present.

The classical way of thinking about this, as I'm sure you all know, is the diffusion of innovation, or the adoption curve.

Here, the Y-axis shows the percentage of people affected and the X-axis shows the time.

And not so many people are affected at first, and we get this typical sigmoid, or S-shaped curve.

The reason for this shape is that initially one or two people are infected or affected. Then it affects or infects 2 people, then 4 more, 8, 16, etc., and you get a curvilinear epidemic growth stage.

And eventually the population will saturate.

Fewer and fewer people are still available to infect, and then the curve plateaus, giving us this classic sigmoid curve.

And this goes for germs, ideas, product adoption, behavior, and more.

But things don't just spread randomly across human populations.

It actually spreads through the network.

Because, like I said, we live in networks, and these networks have a certain kind of structure.

Now, if you look at a network like this, this is 105 people.

And the lines, the dots represent people and the lines represent friendships.

You may find that people occupy different places in your network.

And there are many relationships between people.

Friendships, sibling relationships, spouse relationships, colleague relationships, neighbor relationships, etc.

And different kinds of things spread out into different kinds of connections.

For example, STDs spread beyond sexual relationships.

Or, for example, people's smoking behavior could be influenced by their friends.

Alternatively, their altruistic or charitable giving behavior may be influenced by colleagues or neighbors.

However, not all locations in the network are the same.

So if you look at this, you can quickly see that different people have different numbers of connections.

Some have 1 connection, some have 2, some have 6, some have 10.

This is called the "degree" of the node, or the number of connections it has.

But in addition there is something else.

So if you look at nodes A and B they both have 6 connections.

But if you can look at this [network] picture from a bird's eye view, you can see that there is something very different about nodes A and B.

So listen to this -- you can cultivate this intuition by asking -- if a deadly bacterium was spreading through your network, would you rather be A or B?

(Audience: B.) Nicholas Christakis: B, it's obvious.

B is at the edge of the network.

Now, who would you like to be if there was some interesting gossip circulating through your network?

A. And you can quickly see that A is more likely to get what's diffused sooner because of its structural position in the network.

In fact A is more central, which can be formulated mathematically.

So, if you want to track what is spreading through your network, ideally you would put sensors on the central figures in your network, including node A, to watch people in the middle of the network and somehow detect early on what is spreading through your network.

So if you see them infected with germs or information, you will soon know that everyone is going to be infected with this germs and information.

And this is much better than watching 6 randomly chosen people without considering the structure of the population.

In fact, if you can do that, you'll see something like this:

The left panel also has an S-curve of adoption.

The red dashed line shows what happens to adoptions in random people, and the left line, shifted to the left, shows what happens to adoptions in the central person in the network.

The y-axis is cumulative instances of infection and the x-axis is time.

The right side shows the same data, but here with the daily incidence.

And what we're showing here is that very few people are affected, more and more people are getting here, and this is the peak of the epidemic.

But what has shifted to the left is what is happening in the central individual.

And the difference between these two times can provide early detection, or early warning, of impending epidemics in mankind.

The problem, however, is that it is not always possible to map human social networks.

It can be expensive, impractical, unethical, or frankly impossible.

So how do you know who the key players in your network are without actually mapping the network?

What we came up with was the idea of ​​using old or known facts about social networks. Something like this: "Did you know that your friends have more friends than you?"

Your friends have more friends than you. This is known as the friendship paradox.

Imagine a person who is very popular on social networks (like a party host with hundreds of friends) and a misanthropic person who has only one friend. You pick someone randomly from the population. They were much more likely to know the party host.

And if you name the party host as a friend, that party host has 100 friends, or more friends than they do.

And this is essentially what is known as the paradox of friendship.

Random people's friends have a higher degree and are more central than random people themselves.

You can intuitively understand this by imagining just the people at the edge of your network.

If you choose this person, this person is the only friend you must nominate. Due to its structure, it needs at least two friends, usually more.

And it happens on all peripheral nodes.

And in fact, when you move, everyone you choose, when they randomly nominate, it happens across the network. When a random person nominates their friend, you are closer to the center of the network.

Therefore, we decided to use this idea to study whether we can predict phenomena in networks.

Because the idea is that you can take a random sample of people, have them nominate a friend, and that friend becomes more central, and you can do this without mapping the network.

And we tested this idea just a few months ago during the fall-winter 2009 H1N1 flu outbreak at Harvard University.

1,300 randomly selected undergraduate students were asked to nominate their friends, and both the randomly selected student and their friends were tracked daily in time to see if there was an epidemic of the flu.

And we did this passively by looking to see if they went to college health services.

I also had them [proactively] email me several times a week.

Exactly what we predicted happened.

So the random group is inside the red line.

The friend group craze has moved to the left and here.

And the difference between them is 16 days.

By monitoring a group of friends, we were able to get warnings of this impending human epidemic 16 days in advance.

In addition, if, for example, an analyst is trying to study an epidemic or predict adoption of a product, what they can do is pick a random sample from the population, have them nominate a friend, have them follow that friend, and have both the random pick and that friend follow.

Among friends, for example, the first evidence of a spike above zero in innovation adoption would be evidence of an impending epidemic.

Alternatively, you can see the moment when the two curves first diverge, as shown on the left.

When did the random start -- when did your friends take off and move away from the random, and [when] did their curves start changing?

And, as indicated by the white line, it occurred 46 days before the peak of the epidemic.

Therefore, this would be a technique that could give more than a month and a half advance warning of an influenza epidemic in a particular population.

I must say that how advanced you can get notified about anything depends on various factors.

It may depend on the nature of the pathogen. Different pathogens use this technique with different warnings. Or it could depend on some other phenomenon that is prevalent, or, frankly, the structure of human networks.

In our case, although it wasn't required, we were also able to actually map the student network.

Here is a map showing 714 students and their bonds of friendship.

And from now on, I'm going to move this map.

Get daily cuts through the network for 120 days.

Red dots are flu patients, yellow dots are friends of people who have the flu.

And the size of the dots is proportional to how many of your friends have the flu.

So the bigger the point, the more friends you have with the flu.

Looking at this image, where September 13th is here, you can see some cases glowing.

You'll see the flu craze in the middle.

Here we are on October 19th.

The slope of the epidemic curve is approaching now in November.

Bang, bang, bang, bang, bang -- lots of blooms in the middle, then a kind of plateau, with fewer and fewer cases towards the end of December.

And this type of visualization shows that such epidemics take root and first affect central figures before affecting others.

Now, as I have suggested, this method is not limited to bacteria, but actually applies to anything spread within a population.

Information spreads within the group, norms spread within the group, and behavior spreads within the group.

And by behavior, we mean things like criminal behavior, voting behavior, medical practices such as smoking, vaccination, product adoption, or other types of behavior related to interpersonal impact.

This technique allows for early warning or early detection of adoption within the population if I might do something that might affect those around me.

The important thing is that it must have an interpersonal impact in order for it to work.

It can't be due to some broadcast mechanism affecting everyone uniformly.

The same insights can now be leveraged in other ways with networks, such as using interventions that target specific populations.

For example, the concept of herd immunity is probably familiar to most of you.

So if you have a population of 1,000 and you want to immunize that population against a pathogen, you don't have to immunize everyone.

Vaccinating 960 of them is like vaccinating 100 [percent].

Even if one or two people without immunity are infected, there is no one to infect.

They have immune people around them.

So 96 percent is equivalent to 100 percent.

Now, some other scientists took a 30% random sample of these 1000, 300 people and estimated what would happen if they were vaccinated.

Can we get herd-level immunity?

And the answer is no.

But if you were to vaccinate those 30 percent, or 300, of your friends, get the same number of vaccines, and then vaccinate those 300 friends, or 300 friends, you would get the same level of herd immunity as if you had vaccinated 96 percent of the population at a higher efficiency, under tight budgetary constraints.

And similar ideas can be used, for example, to target the distribution of mosquito nets and the like in developing countries.

If we can understand the structure of the village network, we can target who should be given interventions to facilitate the spread of this kind.

Because, frankly, advertising with all kinds of products.

Understanding how to target can affect the efficiency of what you're trying to achieve.

And indeed, today we can use data from all kinds of sources.

This is a map of 8 million phone users in European countries.

Every dot represents a person and every line represents call volume between people.

And using such data, which is acquired passively, we can map across these countries and understand who is where in the network.

You can get this kind of structural insight without actually running any queries.

As you know, such features are also available from other sources such as email correspondence, online correspondence, and online social networks.

And indeed, we are in an era of what we call “large-scale passive” data collection efforts.

These are all sorts of ways that you can use data collected in large amounts to build sensor networks, track populations, understand what's going on within them, and intervene to make them better.

Because these new technologies tell us not just who is talking to whom, but where everyone is, what they are thinking based on what they are uploading to the internet, and what they are buying based on what they buy.

And by processing all this management data together, we can understand human behavior in ways that were never possible before.

So, for example, you can take advantage of truckers' fuel purchases.

So truck drivers are just doing their jobs and buying fuel.

We also find that truckers' fuel purchases are skyrocketing, indicating that the recession is coming to an end.

Or, by monitoring the speed at which people travel with their phones on highways, the phone company can see that traffic jams are occurring as speeds decrease.

And that information can be fed back to subscribers, but only to subscribers on the same highway behind the traffic jam.

Alternatively, we can passively monitor physician prescribing behavior and observe how the diffusion of drug innovation occurs within physician networks.

Alternatively, we can monitor people's purchasing behavior and see how this kind of phenomenon spreads within the human population.

And I think there are three ways that these large-scale passive data can be used.

One, as I just explained, is completely passive. For example, it does not really intervene in any way with the population, as in the example of truck drivers.

One is semi-active, like my flu example, where you have some people nominate their friends and passively monitor them for flu. -- Then you will get a warning.

Or, as another example, if you're a phone company, figure out who the key people in your network are and ask them, "Could you email me your fever every day?"

Please email us your temperature. ”

It collects vast amounts of information about people's temperatures from centrally located individuals.

And it will enable mass surveillance of impending epidemics with minimal input from people.

Or, ultimately, as I think speakers from today onwards will speak, we can operate more fully, with people all over the world joining Wikis, taking pictures, watching elections, and uploading information in such a way that we can pool information to understand social processes and phenomena.

In fact, I think the availability of these data heralds a sort of new era in what I and others like to call "computational social science."

It's like when Galileo invented or didn't invent but came to use the telescope and was able to see the sky in a new way, or when Leeuwenhoek noticed or actually invented the microscope, he was able to see biology in a new way.

But now we have access to this kind of data, which allows us to understand social processes and phenomena in entirely new ways that were not possible before.

And with this science, we can understand exactly how the whole is greater than the sum of its parts.

And indeed, these insights can be used to improve society and enhance human well-being.

thank you.

Now, since this is TEDGlobal, can anyone tell me what it's called in French?

I'm sure you all know about the history of Hurdy-Gurdy, or "vielle à rue".

"Zamfona" in Spanish.

It's Italian for "Gironda".

Hurdy gurdy, or wheel fiddle.

These are the different types and shapes of Hurdy Gurdy.

The hurdy-gurdy is the only instrument that uses a crank to spin the wheels and scrape the strings to produce music, much like the bow of a violin.

There are 3 types of strings.

The first string is a drone string that produces a continuous sound like a bagpipe.

The second string is the melody string, played on a wooden keyboard tuned like a piano.

And the third string is pretty innovative.

It is also the only instrument that uses this kind of technique.

It launches the so-called "Buzzing Bridge" or "Dog".

When you turn the crank and apply force, it makes a sound like a dog barking.

All of this is pretty innovative considering that the hurdy-gurdy came out about 1,000 years ago and required two people to play. One turns the crank, and the other, yes, physically pulls out the big wooden pegs and plays the melody.

Fortunately, all this changed after a few centuries.

So one person can actually play and carry almost - which is pretty heavy - a hurdy-gurdy.

Hurdy-gurdy has historically been used primarily in dance music for centuries due to the uniqueness of the melody combined with the acoustic boombox.

And today, hurdy gurdy is used in all kinds of music in England, France, Spain and Italy, including traditional folk music, dance, contemporary music and world music.

And this kind of hurdy-gurdy takes three to five years [to order and receive].

This is also made by a professional string instrument maker in Europe.

And it's very difficult to tune.

So let's get started, why don't you ask?

(Audience: Yes.) Caroline Phillips: I didn't hear you. Why don't you ask? (Audience: Yes!) CP: Okay.

I would like to sing in the Basque language, which is spoken in the Basque Country where I live and in the region that straddles France and Spain.

(Music) [Basque] (Music) Thank you.

(Applause) This is a song I wrote based on traditional Basque rhythms.

The song has a Celtic feel to it.

(music) Thank you. thank you.

(applause)

Hello. I would really like to start with two questions. The first question is how many people here actually eat pork meat?

Hands up -- oh, there's a lot of them.

And how many of you have actually seen a live pig that produces this meat?

last year?

In the Netherlands, where I'm from, you don't actually see pigs. This is really strange. Because there are 12 million pigs for a population of 16 million.

And of course the Dutch cannot eat all these pigs.

About a third is eaten and the rest is exported to Europe and other countries around the world.

Most of them are sent to England and Germany.

And what intrigued me was that historically the whole pig was used to the last bit and nothing wasted. And I wanted to know if this is actually still the case.

I spent about three years researching it.

And I tracked down this pig with the number "05049" to find out what kind of product it was made from.

And in the last few years I've met all kinds of people, farmers and butchers. I think this is a given.

But I've also met aluminum mold makers, ammunition makers, and all sorts of other people.

And what struck me was that the farmers had no idea what their pigs were actually made of, but consumers, like us, had no idea that all these products contained pigs.

So what I did is I took all of this research and created it. So it's basically a product catalog for this one pig, with a copy of his ear tag on the back.

And it consists of seven chapters, the chapters being Skin, Bones, Flesh, Internal Organs, Blood, Fat, and Others.

(Laughter) The total weight is 103.7 kilograms.

And I'd like to show you some images from the book to show you how often you usually meet some of these pigs in person.

You probably start your day with a shower.

Therefore, in soaps, fatty acids made by boiling pork bone fat are used not only as a hardening agent, but also to give a pearly effect.

Then, look around in the bathroom and you'll see more products such as shampoo, conditioner, anti-wrinkle cream, body lotion, but also toothpaste.

So before breakfast you have already met the pig many times.

And at breakfast, I used protein from pigs, pig hair, or pig hair that I tracked as a dough improver.

(Laughter) Well, the producers are saying this. “Of course, we improve the fabric.”

Low-fat butter, and indeed many low-fat products, actually lose their taste and texture when the fat is removed.

So they put the gelatin back in to keep the texture.

Well, when you go to work, it is very possible that there is aerated concrete under the road or under the building. This is a very light type of concrete that actually contains protein from bone inside and is completely reusable.

Train brakes, at least German train brakes, have brake parts made of bone ash.

And cheesecake, chocolate mousse, tiramisu, vanilla pudding, and anything else that's chilled in the supermarket uses gelatin to make it look nicer.

Fine bone china -- this is a true classic.

Of course, fine bone china bones give transparency and strength to create a really delicate shape like this deer.

Pigs are really there when it comes to interior decoration.

It is also used in paints to add luster as well as texture.

With sandpaper, the bone glue is actually the glue between the sand and the paper.

And bristles are used for paintbrushes, apparently because the bristles are so durable that they are very suitable for making paintbrushes.

Of course, I didn't mean to introduce meat because half of this book is meat and you probably know what meat it is.

But I didn't want you to miss this one. Because this is what's called, well, "portion-controlled cuts of meat."

And this is actually sold in the frozen section of the supermarket.

What is it - it's just a steak.

So this is being sold as a cow, but what happens when you slaughter a cow -- at least in an industrial plant farm -- you're left with all those little pieces of steak that you can't really sell as steak, so you use fibrin that's taken from pig's blood to glue these together into this really big sausage, and then you freeze the sausage, cut it into little slices, and sell it as steak again.

And this actually happens with tuna and scallops as well.

It might be nice to drink beer while eating steak.

In the brewing process, beer contains many turbidity components, so in order to remove these turbidity factors, some companies pass the beer through a kind of gelatin sieve to remove turbidity.

Actually, this applies not only to fruit juices, but also to wines.

In fact, there is a company in Greece that produces cigarettes whose filters contain pig hemoglobin.

According to them, this creates an oxygenator inside the filter.

(Laughter) So this is actually a healthier cigarette.

(Laughter) Injectable collagen, or pig collagen since the '70s, has been used to inject wrinkles.

The reason is that pigs are actually very close to humans, so is collagen.

Well this has got to be the strangest thing I've found.

This is a bullet from a very large US ammunition company.

And while I was making the book, I contacted the producers of all the products, wanting them to send me real samples and real specimens.

So I sent the company an email saying, "Hi. I'm a Christian. I'm doing this research."

So can you send me the bullets? ”

(laughs) And well, I didn't expect them to reply to my email.

But they replied and said, “Thank you for your email. Interesting story.

Are you related to the Dutch government? ”

I found it very strange, as if the Dutch government were emailing everyone.

(Laughter) So the most beautiful thing I've found in this book, or at least what I think is the most beautiful thing, is this heart valve.

This is actually a very low tech and a very high tech product at the same time.

A low-tech bit is literally a pig heart valve attached to a high-tech bit with a shape-memory metal casing.

And what happens is that it can be implanted into a human heart without open-heart surgery.

And when it's in the right position, you remove the outer shell, you remove the heart valve, you get this shape, and at that moment it instantly starts beating.

It's really kind of a magical moment.

So this was actually a Dutch company, so I called them and asked, "Can I borrow a heart valve?"

And the makers of this product were really enthusiastic.

So they said, "Okay, I'll put it in a jar with formalin, and you can borrow it."

That's excellent. I didn't hear from him for weeks after that, so I called and asked. "What is happening to the heart valves?"

Then they said, "The directors of the company have decided not to lend this heart valve because they want to associate their product with pigs."

(Laughter) Well, the last product in my book is renewable energy. To show that my original question of whether pigs are actually used to the end is still true.

That's right, because anything else that can't be used is turned into fuel that can be used as a renewable energy source.

A total of 185 products were found.

And what they showed me is, first of all, it's strange that we don't treat these pigs as absolute kings and queens.

And two, we really have no idea what all these products around us are made of.

And while you might think I love pigs, I actually like, well, a little bit, but I generally prefer raw materials.

And I think in order to care more about what's behind our products -- the livestock, crops, plants, non-renewable materials -- but also the people who produce these products, I think the first step is to actually know they're there.

thank you very much.

(applause)

52 minutes ago I took this photo about 10 blocks from here.

This is the Grand Cafe in Oxford.

I took this photo because it turned out to be the first coffee house in England, opened in 1650.

That's the big claim to fame.

And I wanted to show you that not because I want to do a Starbucks tour of historic England (laughs), but rather because British coffeehouses were pivotal to the development and dissemination of what is now called the Enlightenment, one of the great intellectual blooms of the last 500 years.

And one of the reasons coffee houses played such a big role in the birth of the Enlightenment was what people were drinking there.

Because before coffee and tea became popular through British culture, it was alcohol that people – elite and mass – drank from morning till night, every day from morning till night.

Alcohol was the preferred daytime drink.

A little beer at breakfast, a little wine at lunch, especially a little gin around 1650, and a little beer and wine at the end of the day.

The water was not safe to drink, so it was a sound choice.

So virtually the entire nation drank alcohol all day long before the rise of coffee houses.

(Laughter) And imagine what that would be like in your life -- and I think this is true for some of you -- if you were drinking all day long -- (Laughter) And let's say you switch from a depressant to a stimulant in your life.

You'll have better ideas.

You will become more perceptive and more observant.

So it's no coincidence that when Britain switched to tea and coffee, there was a blossoming of innovation.

But another thing that makes coffee houses important is the structure of the space.

It was a space where people from different backgrounds and different fields of expertise could gather and share.

As Matt Ridley put it, it was a space where ideas could have sex.

In a way, this was their matrimonial bed. Ideas come together there.

And coffee houses appear somewhere in the story for a surprising number of innovations during this period.

Over the last five years, I've spent a lot of time thinking about coffee houses. Because I've been on a quest to investigate this question of where good ideas come from.

What are the environments that lead to extraordinary levels of innovation and extraordinary levels of creativity?

What is the environment like, what is the creative space?

And what I've done is I've observed both environments, like coffee houses, and I've observed very innovative media environments like the World Wide Web. I went back to the history of the first city. I have also been to biological environments with extraordinary levels of biological innovation, such as coral reefs and rainforests.

And what I'm looking for is a shared pattern that appears again and again in all these environments: the characteristic behavior.

Are there recurring patterns that we can learn from and adopt and apply to make our own lives, our organizations, our environments more creative and innovative?

But what we have to do to understand this and really understand these principles is that we need to get rid of the way conventional metaphors and language lead us to certain concepts of idea creation.

We have a very rich vocabulary for expressing moments of inspiration.

We have 'flashes' of insight, 'strokes' of insight, 'episodes', eureka moments, 'bulb' moments, right?

All these concepts, rhetorically flamboyant, share the basic premise that ideas are singular.

That's what happens in great, glorious moments.

But really, what I want to argue, and really need to start with, is the idea that ideas are networks at the most basic level.

So this is what is happening in your brain.

An idea, or new idea, is a new network of neurons firing in sync with each other in the brain.

This is a new configuration that has never existed before.

And the problem is how to guide the brain into an environment that facilitates the formation of these new networks.

And indeed, it turns out that the network patterns in the outer world mimic many of the network patterns in the inner world of the human brain.

So the metaphor I want to use can be taken from a very recent tale of great ideas, much newer than the 1650s.

A great guy named Timothy Prestero has an organization called Design That Matters.

They decided to tackle this really pressing issue in the midst of the dreaded problem of infant mortality in developing countries.

One of the most frustrating things about this is that we know that if we could keep premature babies warm by introducing modern neonatal incubators into any setting, we could basically - very simply - cut infant mortality in those settings in half.

So the technology is there.

These are standard in all developed countries.

The problem is, if you buy a $40,000 incubator and send it to a medium-sized African village, it will work fine for a year or two, but then something will go wrong and it will break and it will stay broken forever. Because we don't have a whole system of spare parts, and we don't have the on-site expertise to fix this $40,000 piece of equipment.

This means that even if you spend a lot of money to help these countries and acquire cutting-edge electronic equipment, you will face the problem that it will not help in the end.

So what Prestero and his team decided to do was look around and see. What are the abundant resources in these developing world conditions?

And what they've noticed is that despite not having much of a DVR or microwave, the car seems to keep running just fine.

There are Toyota 4Runners on the streets here and there.

They seem to have the expertise to keep the car moving.

So they started thinking, "Can we make a newborn incubator made entirely out of auto parts?"

And this is what they came up with.

It's called a NeoNurture device.

From the outside it looks like a normal little thing like you would find in a modern western hospital.

Everything inside is car parts.

It has a fan, headlights for heating, door chimes for alarms, and runs on a car battery.

So all you need is a Toyota spare part and the ability to fix headlights and you can fix this.

It's a great idea, but I'd say it's actually a great metaphor for how ideas are born.

We think of our breakthrough ideas like a $40,000 brand new incubator, cutting edge technology.

But more often than not, they are assembled from whatever parts happen to be nearby.

We take ideas from other people, people we learn from, people we meet at coffee shops, and we sew them into new shapes to create something new.

That's where innovation comes from.

So that means we need to change some of the models of what innovation and deep thinking really looks like, right?

So this is a vision.

Another is Newton and Ringo when Newton was at Cambridge.

This is an Oxford statue.

As you sit there pondering, an apple falls from a tree and you get a theory of gravity.

In fact, spaces that have historically brought about innovation tend to do this.

This is Hogarth's famous painting of a sort of political dinner in a tavern, and this is what coffee shops looked like back then.

In such a chaotic environment, ideas are more likely to converge and people from different backgrounds are more likely to collide in new, interesting and unpredictable ways.

So if you're looking to build a more innovative organization, oddly enough, you need to build a space that's a bit more like this.

This is what your office should look like and this is part of my message.

And one of the problems with this is that people who actually self-report where their good ideas lie or the history of their best ideas are notoriously unreliable when researching this area.

And a few years ago, a brilliant researcher named Kevin Dunbar decided to basically implement a Big Brother approach to figuring out where good ideas come from.

He visited many science labs around the world and videotaped everyone doing their job, whether it was sitting in front of a microscope or talking to a colleague at the water cooler.

And he recorded all these conversations, trying to figure out where the most important ideas came from.

When you think of the classic image of a scientist in a lab, you have this image. I mean, they're looking through a microscope and they see something in the tissue sample. And "Eureka!" -- they have an idea.

In fact, what happened when Dunbar saw the tape is that, in fact, almost all of the significant breakthrough ideas didn't come to him alone in front of a lab microscope.

They happened at the conference table at the weekly lab meetings, where everyone got together to share the latest data and findings, often mistakes people were having, errors, noise in the signals they were discovering, and so on.

And something about that environment, I started calling it the "liquid network." There, different ideas come together, different backgrounds, different interests, pushing and bouncing off each other. The environment is really an environment conducive to innovation.

Another problem people have is that they want to condense innovation stories into short time frames.

So they want to tell the story of a new moment.

They want to say, "I was there, I was standing there, and suddenly it was all clear in my head."

But in fact, if you look back in the historical record, you'll find that many important ideas had very long latent periods.

I call this "late hunch".

We hear a lot these days about hunches, instincts, and sudden moments of lucidity like the blink of an eye, but the reality is that many great ideas linger in the back of our minds, sometimes for decades.

They feel there's an interesting problem, but they don't yet have enough tools to discover it.

They spend all their time working on a particular problem, but there's still something else they're interested in but can't quite solve.

In his autobiography, Darwin himself tells the story of coming up with the idea of ​​natural selection as a classic moment of discovery.

He's in his study, it's October 1838, and he's actually reading Malthus about population.

Then suddenly the basic algorithm of natural selection came to mind, and he said, "Oh, finally, I have a theory that works."

It's in his autobiography.

About ten or twenty years ago, a brilliant scholar named Howard Gruber went back and examined Darwin's notebooks from this period.

Darwin kept these large notebooks, in which he wrote down every little idea, every little hunch that came to his mind.

And what Gruber discovered was that Darwin had a complete theory of natural selection for months and months before he was allegedly inspired by reading Malthus in October 1838.

At times it seems as though you are reading a textbook from before Darwin had his inspiration.

And you can see that Darwin had an idea in a way, he had a concept, but he still couldn't quite think it through.

In fact, great ideas often fade away after a long time.

Now, the challenge for all of us is how to build the environment that allows these ideas to have such long half-lives.

It's hard to go up to your boss and say, "I have a great idea for our organization."

It will come in handy in 2020. ”

(laughter) "Can I have a minute?"

Some companies, such as Google, now offer 20% innovation leave.

In some ways, these are the mechanisms that foster intuition within an organization.

But it's important.

And the other is to connect that hunch with the hunch of others. It happens often.

You have half the idea and someone else has the other half. And when you're in the right environment, they turn into something greater than the sum of its parts.

So, in a way, we often talk about the value of protecting intellectual property. Building barricades, having secret R&D labs, and patenting everything we have keeps ideas valuable, motivates people to come up with more ideas, and makes the culture more innovative.

But I think there's an argument to be made that at least as much, if not more, time should be spent cherishing the premise that binds ideas together than just protecting them.

And I bring you this story that I think captures many of those values.

This is just a great story of innovation, showing how it can happen in unexpected ways.

Sputnik was just launched in October 1957.

We are at the Applied Physics Laboratory at Johns Hopkins University in Laurel, Maryland.

It is now Monday morning and the news broke about this satellite that is now orbiting the Earth.

And of course, this is geek heaven, right?

All the physics geeks out there are thinking, "Oh my god! I can't believe this. I can't believe this happened."

And two of them, researchers in their twenties at APL, are at a cafeteria table, having an informal conversation with a large group of colleagues.

And the names of these two men are Guier and Weiffenbach.

They start talking, and one of them says, "Hey, has anyone tried to ask about this?"

There is a satellite in space, and it is clearly transmitting some kind of signal.

So they ask some of their colleagues, and everyone says, "No, I didn't think of that."

That's an interesting idea. ”

It turns out Weifenbach is an expert in microwave reception and has a small antenna with an amplifier in his office.

So Geier and Weifenbach returned to Weifenbach's office and began what we now call "hacking."

And after a few hours they started receiving signals. Because the Soviet Union made tracking Sputnik so easy. It was just 20 MHz, so it was very easy to pick up. Basically, I was afraid people would think it was a hoax, so I made it very easy to find.

So they're sitting there listening to this signal, and people start coming into the office and saying, "That's pretty cool. Can you hear it?"

And then they think, 'Oh, this is kind of historical.

We may be the first people in the US to hear this.

you should record it. ”

So they brought in this big, clunky analog tape recorder and started recording little 'beep' 'beep' sounds.

And start writing down the date and time stamps for each little beep you record.

And they start thinking, "Well, we're noticing a tiny little frequency shift here.

Now with a little basic math using the Doppler effect, you could probably figure out how fast the satellite is moving. ”

And then they played around a bit more and talked to a few colleagues with other specialties.

And they said, "We can actually look at the Doppler tilt to figure out where the satellite is closest and farthest from the antenna.

That's nice. "

Eventually they get their permit. These are all small side projects that weren't part of the formal job description. They get permission to use the new UNIVAC computer that fills the entire room they just got with APL.

And they did some more numbers, and at the end of about three to four weeks, they found that they had mapped the satellite's exact orbit around the Earth just by listening to this tiny signal. It was based on this little hunch they had during lunch one morning.

A few weeks later, their boss, Frank McClure, pulled them into a room and said, "Hey guys, I want to ask you about a project you guys were working on.

From known locations on the ground, we determined the unknown locations of satellites orbiting the planet.

Could you please go another way?

If you know the satellite's position, can you pinpoint an unknown location on the ground?"

They thought about it and said, "Well, I think we can probably do it. Let's do the numbers here."

So they went back and thought, came back and said, 'It's actually going to be easier.'

And he said, "Oh, that's great, because I'm building a new nuclear submarine right now (laughs)."

And if the submarine does not know where it is in the middle of the Pacific Ocean, it is very difficult to understand how to get missiles to land directly over Moscow.

So we think we can launch a lot of satellites and use them to track submarines and find out where they are in the middle of the ocean.

Could you please work on that issue? ”

Thirty years later, Ronald Reagan actually opened it up to make it an open platform that anyone could build upon, let anyone build new technologies to create and innovate on top of this open platform, and leave it open for anyone to do pretty much anything they wanted to do with it.

And now, I assure you, half the pockets in this room, maybe more, are now holding devices that are communicating with one of the satellites in space.

And I'm sure some of you have used this device and the satellite system to find a nearby coffee house recently -- (laughter) last week or so, right?

(Applause.) And I think this is a great case study and a great lesson about the power of open and innovative systems—the incredible power of the unplanned, the emergent, the unpredictable.

Building them right will take them in whole new directions that their creators never dreamed of.

So here are some people who thought they were just following this hunch, this little passion that was budding. Afterwards, we thought we were fighting the Cold War, but it turns out they were just helping someone find Soy Latte after all.

(Laughter) That's how innovation happens.

Chance helps connected minds.

thank you very much.

(applause)

I want you to go on a trip with me.

Imagine yourself driving down the small roads of Africa. If you look to the side while driving, this is what you see. You can see the cemetery spread out.

Then you park your car, get out and take a picture.

And you go out into town and ask, "What's going on here?"

And people are reluctant to tell you at first.

And someone said, "Here are the people who have recently died of AIDS in our area."

HIV is different from other medical conditions. it is accusatory.

People are reluctant to talk about it. It comes with fear.

Today we talk about HIV, death and stigma.

This is a medical story, but more than that, it's a social story.

This map shows the global distribution of HIV.

And as you can see, Africa has a disproportionate share of infections.

There are currently 33 million people living with HIV worldwide.

Of these, two-thirds, or 22 million, live in sub-Saharan Africa.

There are 1.4 million pregnant women living with HIV in low- and middle-income countries, 90% of whom live in sub-Saharan Africa.

We talk about things in relative terms.

And I'll tell you about every year's pregnancies and HIV-positive mothers.

In the large United States, 7,000 mothers give birth to HIV-infected children each year.

But if you go to Rwanda, in a very small country, there are 8,000 pregnant HIV-infected mothers.

It then goes to Balagwanath Hospital, a suburb of Johannesburg, South Africa, where 8,000 HIV-positive pregnant women give birth. This is the same hospital as the country.

And realize this is just the tip of the iceberg. If you compare everything here to South Africa, it only pales. Because 300,000 HIV-infected mothers give birth to children in South Africa each year.

So we talk about PMTCT and refer to PMTCT, prevention of mother-to-child transmission.

I think most people assume that if a mother is HIV positive, she will pass it on to her children.

The reality is, indeed, very different.

In resource-rich countries, despite all the testing and treatment available today, less than 2% of babies are born HIV-positive and 98% of babies are born HIV-negative.

Nevertheless, the reality in resource-poor countries is that 40 percent, or 40 percent of children, are infected because there is no testing or treatment available, and there is a big difference between 40 percent and 2 percent.

So these programs, and in my story I refer to PMTCT, these preventive programs are, simply put, the tests and medicines you give your mothers to keep them from infecting their babies, and also the medicines you give them to keep them healthy and active in parenting.

So it's a test that mothers take when they come home.

It's a drug she receives to protect her baby in the womb and during childbirth.

It's the guidance she got on breastfeeding infants and safer sex.

This is the whole package of services and it works.

In other words, the number of children infected with HIV in the United States has dropped by 80% since treatment became available in the mid-1990s.

Fewer than 100 babies are born with HIV in the United States each year, yet today more than 400,000 children are born with HIV each year worldwide.

what do you mean?

This means that 1,100 children are infected every day. 1,100 children are infected with HIV every day.

And where do they come from?

Well, less than 1 come from the US.

On average 1 person is from Europe.

100 come from Asia and the Pacific.

And every day in Africa, 1,000 babies are born with HIV.

So once again, I look here at the disproportionate proportions of HIV across the globe and in Africa.

And let's look at another map.

And here again we find a disproportionate share of doctors in Africa.

That thin strip you see here is Africa.

And it's the same for nurses.

The truth is that sub-Saharan Africa accounts for 24 per cent of the global burden of disease, yet only 3 per cent of the world's health workforce.

This means that doctors and nurses have absolutely no time to care for patients.

Nurses in busy clinics see 50 to 100 patients a day, and can only spend a few minutes per patient.

So what does it mean when you look at these PMTCT programs?

Well, back in 2001, when there was only a simple test and a single dose of medicine, a nurse had to counsel a patient for an HIV test, administer an HIV test, explain the results, administer a dose of nevirapine, explain how to take it, discuss the infant's feeding options, enhance the infant's feeding, and test the infant in minutes.

Fortunately, since 2001, new treatments and new tests have been developed that are much more successful, but there are no nurses anymore.

And these are the tests that nurses have to do in the same few minutes.

It's not possible -- it won't work.

Therefore, we need to find better ways to provide care.

This is a photo of a maternal and child health clinic in Africa. A pregnant mother and a mother with a baby are coming.

These women are here for care, but we know it's not enough just to get them checked and given medicine.

Medicine is not the same as medicine.

Doctors and nurses, frankly, don't have the time or the skills to tell people what to do in a way they can understand.

I am a doctor -- I tell people what to do and expect them to follow my lead -- because I am a doctor. I went to Harvard, but the reality is that I tell my patients, 'You should have safer sex.

You should always use a condom." Yet, in her relationship, she has no authority. what happens?

Even if I tell her to take medicine every day, it doesn't work because no one in her family knows about her illness.

So we need to do more, we need to do it differently, we need to do it in a way that is affordable, accessible and can be done at scale. This means it can run anywhere.

So I want to tell you a story, I want to take you on a little trip.

Imagine, if possible, that you are a young African woman going to a hospital or clinic.

When she takes a test, she discovers that she is pregnant and is overjoyed.

Then another test tells you you're HIV positive, and you're devastated.

Then the nurse walks you into the room and explains the tests, HIV, the medicines you can take, how to take care of yourself and the baby, and you hear nothing about it.

All you hear is, "I'm going to die, and so will my baby."

And you're out in the street, but you don't know where to go.

And I don't even know who to talk to. Because, in fact, HIV is so stigmatizing that if you have a partner, family member or someone in your home, you are likely to be left without any support.

And this is the picture and the story of HIV in Africa today.

But we are here to talk about possible solutions and some good news.

And I would like to change the subject a little.

For the same mother, the nurse takes her to her room after giving her an examination.

The door opens and there is a room full of mothers, mothers with babies, sitting and talking and listening.

They are drinking tea and eating sandwiches.

And when she was inside, a woman came up to her and said, "Welcome to mothers2mothers.

sit down. You are safe here.

We are all HIV positive.

No problem. you will live

Your baby will be HIV negative. ”

We consider mothers to be the single greatest resource of our community.

A mother takes care of her children and takes care of the house.

Men often disappear.

They work or are not part of the family.

Our organization, mothers2mothers, recruits women living with HIV as caregivers.

We bring back HIV-infected mothers who have undergone these PMTCT programs in our facilities as part of our medical team in collaboration with our doctors and nurses.

These mothers, whom we call mentor mothers, can reach out to women like themselves who are pregnant with babies, who have found out they are HIV positive and who need support and education.

And they support them with their diagnosis, educating them on how to take their medication, how to take care of themselves, and how to care for their baby.

please think about it. If you need surgery, you want the best possible surgeon.

But if you want to know how the surgery will affect your life, you want to get involved with someone who has had the surgery.

Patients are experts in their own experience and can share that experience with others.

It is medicine that goes beyond medicine alone.

So the mothers who work for us are from the communities where they work.

They are employed and paid as professional members of the medical team, just like doctors and nurses.

And we open a bank account for them and their money is protected so it gets paid directly into their account. Men cannot take it away from them.

They undergo education and training based on a rigorous curriculum for 2-3 weeks.

Well, doctors and nurses are also trained.

However, in many cases, they are trained only once and do not know when new drugs or new guidelines come out.

Our mentor mothers are trained and retrained every year.

And doctors and nurses also look up to them as professionals.

Please try to imagine. For the first time, a female ex-patient is now able to educate her physicians and other patients she cares for.

Our organization has three goals.

The first is to prevent mother-to-child transmission.

The second is to keep mothers healthy, keep mothers alive, keep children alive, and eliminate orphans.

And third, and perhaps most ambitious, is finding ways to empower women, combat stigma, and enable them to live positive and productive lives with HIV.

So what do we do?

Perhaps the most important engagement is the one-on-one engagement that sees patients one-on-one, educates them, supports them, and explains how they can care for themselves.

we will go beyond that. We try to bring our husbands and partners.

In Africa it is very difficult to get involved with men.

Men are less likely to participate in pregnancy care.

But in one country in Rwanda, the policy is that women cannot come for care unless they are accompanied by the baby's father, and that is the rule.

There, the father and mother are counseled and tested together.

Mom and Dad work together to get results.

And this is very important in breaking down prejudices.

Disclosure is very important for prevention.

How can I have safer sex? If there was no disclosure, how would I go about using condoms regularly?

Disclosure is very important for treatment because you need the support of family and friends to take your medications regularly.

I also work in groups.

Now, the group isn't the kind of thing I lecture, but what's going on is the women come together. With the support and guidance of our mentor mothers, they come together to share their personal experiences.

And by sharing, people can gain tactics on how to take care of themselves and publicize how to take their medications.

And then there is also community service, which involves women in the community.

If you can change the beliefs and attitudes of your home, you can also change the beliefs and attitudes of your community.

And if we can change enough communities, we can change the attitudes of the public.

We can change public attitudes towards women and public attitudes towards HIV.

In fact, the most difficult barrier concerns stigma mitigation.

We have drugs and tests, but how do we reduce stigma?

Information disclosure is also important.

So a few years ago, one of my mentor mothers came back and told me a story.

One of her clients asked her to go to his client's house. The client wanted to talk to her mother and siblings about her HIV status, but she was afraid to go alone.

So, the instructor's mother also accompanied us.

Then the patient came into the house and said to his mother and brothers: “I want to talk to you. I am HIV positive.”

And everyone went quiet.

Then the eldest brother stood up and said, "I also have something to say to you.

I am HIV positive.

I was afraid to tell everyone. ”

Then this sister stood up and said, "I am also living with the virus, so I am ashamed."

Then my brother stood up and said, "I am positive too.

I thought you were going to kick me out of my family. ”

And we'll see how this goes.

The last sister stood up and said, "I am positive too.

I thought you would hate me. ”

And for the first time they could all come together, for the first time they could share this experience, and for the first time they could support each other.

(Video) Female Narrator: Women come to us crying and scared.

I tell them that I am HIV positive but my child is HIV negative.

I said to them, "You're going to be successful. You're going to have a healthy baby."

I am proving that there is hope.

Mitchell Besser: Remember the images that show how few doctors and nurses there are in Africa?

And it is also a crisis for the healthcare system.

Even though we have more tests and more drugs, we can't reach people. Not enough providers.

Therefore, we speak in terms of so-called task shifting.

Task-shifting traditionally refers to taking medical services from one provider and giving it to another provider.

Typically, doctors give jobs to nurses.

And the problem in Africa is that there are actually fewer nurses than doctors. So we need to find a new paradigm of medicine.

How can we build a better healthcare system?

We have chosen to redefine our healthcare system as doctors, nurses, and mothers of leadership.

What the nurse does is ask the mother, who is a mentor, to explain how to take the medicine and the side effects.

They commission education about infant feeding, family planning, safe sex, behaviors that nurses just don't have time for, and more.

So, let's go back to preventing mother-to-child transmission.

Globally, these programs are increasingly seen as a bridge to comprehensive maternal and child health.

And our organization is helping women cross that bridge.

Care does not end when the baby is born. We are committed to the ongoing health care of mothers and babies, helping them live healthy and successful lives.

Our organization operates on three levels.

The first is the patient level. Help mothers and babies keep their babies from getting HIV and keep mothers healthy.

The second is community -- women's empowerment.

They become leaders within the community.

These change the way the community thinks. We need to change our attitudes towards HIV.

We need to change attitudes towards African women.

I have to.

We will also review the level of the medical system and build a stronger medical system.

Our healthcare system is broken.

It doesn't work with the current design.

So doctors and nurses who have to try to change people's behavior don't have the skills or the time. So does our mother, our leader.

So redefining the medical team by bringing in a mother as a leader makes that possible.

I started this program in 2001 in Cape Town, South Africa.

At that time, it was just a flash of an idea.

I was in the shower then while quoting Stephen Johnson's very nice speech yesterday about where ideas come from - I was alone.

(Laughter) The program now operates in nine countries, has 670 program sites, meets approximately 230,000 women each month, employs 1,600 mentor mothers, and registered 300,000 HIV-positive pregnant women and mothers last year.

This represents 20 percent of the world's HIV-positive pregnant women, or 20 percent of the world as a whole.

The amazing thing is that the premise is very simple.

HIV-infected mothers caring for HIV-infected mothers.

A past patient is treating a current patient.

and empowerment through employment, reducing prejudice.

(Video) Female Narrator: There is hope, there is hope that one day we will win the war against HIV and AIDS.

Each person must know their HIV status.

People who are HIV negative must know how to stay negative.

People with HIV must know how to take care of themselves.

HIV-positive pregnant women must receive PMTCT services in order to have an HIV-negative baby.

All this is possible if each of us contributes to this fight.

MB: Simple solutions to complex problems.

A mother who takes care of her mother.

it is transformative.

thank you.

(applause)

Let me tell you how I became an HIV/AIDS activist.

This is the name of my campaign, the SING campaign.

In November 2003, I was invited to participate in the launch of Nelson Mandela's 46664 Foundation, his HIV/AIDS Foundation.

And 46664 is the number Mandela had when he was imprisoned on Robben Island.

It's me having the best time of my life on stage with Youssou N'Dour.

The following day, all of the artists were invited to join Mandela on Robben Island. There, Mandela was to stand in front of his former cell and meet the world's press.

You can see the window lattice there.

It was a very important occasion for all of us.

At that moment, Mandela told the world press that a virtual genocide was taking place in his country. Thousands die every day in the post-apartheid Rainbow Nation, and the frontline victims are the most vulnerable women and children.

This made a big impact on my heart. Because I am a woman and a mother, and I didn't know that the HIV/AIDS pandemic was directly affecting women in this way.

And so I decided -- when I left South Africa, when I left Cape Town, I said to myself, 'This is going to be something I have to talk about.

I have to serve ”

So I went on to attend every 46664 event I could attend, and used my platform for press conferences, interviews, speaking, and as a musician out of devotion to Mandela and respect for the incredible and incredible work that Mandela had accomplished.

Everyone in the world looks up to Nelson Mandela, and everyone looks up to Nelson Mandela.

But do they all know what's going on in his country, South Africa, one of the countries with the highest number of virus infections?

I think if I went out on the street and told people what was going on there, they would be shocked.

Years later, I was very, very fortunate to meet Zakki Akhmat, founder of the Treatment Action campaign, a great campaigner and activist.

I met him at the 46664 event.

He wore a T-shirt like the one I'm wearing now.

this is a tool. This shows that I stand in solidarity with people living with HIV and those living with HIV.

In a way, because of prejudice, by wearing this T-shirt, you say, "Yes, we can discuss this issue."

It doesn't have to be in the closet. ”

I became a member of the Treatment Action Campaign. I am very proud to be a member of that wonderful organization.

It's a grassroots movement, 80% of its members are women, most of them living with HIV.

they work in the fields.

They are having a huge impact on people living directly affected by the virus.

They have educational programs.

They highlight the issue of prejudice.

What they are doing is very strange.

And yes, my SING campaign has supported treatment action campaigns the way I've strived to raise awareness and raise funds.

Much of the money I managed to raise went directly to the Treatment Action Campaign and its amazing work, which is still active in South Africa today.

This is my SING campaign.

The SING campaign is basically just me and 3-4 amazing people supporting me.

I have traveled around the world in the past two and a half years. I have been to about 12 countries.

I'm in Oslo, Norway and have a nice check. I was singing in Hong Kong and trying to raise money for people.

In Johannesburg, I had the opportunity to play to a predominantly white, middle-class South African audience, but I ended up in tears, using film clips that are so true to the heart and essence of this terrible tragedy that is happening that people tend to avoid it because they are tired and unsure of the solution.

The current Minister of Health, Aaron Motsoaledi, was at the concert, and I had the opportunity to meet him, and he was absolutely determined to make the changes that are sorely needed.

This is the Scottish Parliament.

After that I became a special envoy for Scotland and HIV.

And I tried to show them my experience and raise their awareness again.

And again, in Edinburgh, with the wonderful African Children's Choir, which I just adore.

And it is children like this, many of whom have been orphaned because their families contracted the AIDS virus.

I am sitting here in New York with Michelle Sidibe -- he is the Director of UNAIDS.

And I am very honored by the fact that Michel invited me to be a UNAIDS ambassador just a few months ago.

In this way, I have strengthened my platform and expanded my reach.

UNAIDS' current message to the world is to virtually eliminate mother-to-child transmission by 2015.

This is a very ambitious goal, but I believe it can be achieved with the political will.

Things like this can happen.

Here I am with an HIV positive pregnant woman. we are smiling Because we are so confident. Because I know that young woman is undergoing therapy to extend her life in order to care for her unborn baby.

And her baby will have PMTCT, which means the baby can be born free of the virus.

That is prevention at the beginning of life.

This is one way to start thinking about interventions in the AIDS pandemic.

Now, I would like to finish with a small story about Avail.

This is Avail. She accompanies me wherever I go.

I tell you her story because she represents one of the millions of HIV/AIDS orphans.

Averill's mother was infected with the HIV virus and died of an AIDS-related illness.

Averill had the virus and she was born with it.

And here she is 7 years old and weighs the same as a 1 year old baby.

At this point in her life, she was suffering from full-blown AIDS and had pneumonia.

We met her at a hospital in the Eastern Cape and spent an entire afternoon with her adorable child.

The doctors and nurses were phenomenal.

They fed her a very special nutritious diet and took great care of her.

And I didn't even know when we would be discharged. Because we filmed her story. I didn't even know if she would survive.

So it was obviously a very emotional encounter and we felt very resonated with this direct experience, this one child, you know, that story.

Five months later we returned to South Africa to see Averill again.

I don't know if you can see the hair growing on my arm, but it is growing.

They stand because they know what I'm trying to show them.

This is the transformation that happened.

Isn't that unusual?

(Applause.) That applause was actually for the doctors and nurses at the hospital who took care of Avail.

And I think you appreciate such changes.

So I would like to say to the audience, if you feel that every mother and every child in the world is entitled to good nutrition and good healthcare, and believe that the Millennium Development Goals, specifically the 5 and 6, should absolutely be committed by all governments around the world, especially in sub-Saharan Africa, please stand up.

I think it's no exaggeration to say that almost everyone in the hall does.

thank you very much.

(applause)

My name is Mwende Katwiwa, poet, Pan-Africanist and freedom fighter.

I was 23 when I first heard about Reproductive Justice.

I worked with Women with Vision and learned that Sister Song defined reproductive justice as follows: The first is the right of women to decide if, when and under what conditions they will have children.

2: A woman's right to choose not to have a baby and options to prevent or terminate a pregnancy.

And third, the right of women to raise their children already in a safe and healthy environment without fear of violence from individuals or governments.

I always wanted to be a mother.

Growing up, I've heard all sorts of things about the joys of being a mother.

I dreamed of seeing my womb weave wonders into this world.

See, I knew I was young.

But I thought it wouldn't hurt to start planning something this big early.

But now I'm 26.

And I don't know if I have what it takes to be a mother in this country.

You see, over the years, America has taught me more about parenting than any book can.

This experience taught me how some women give birth to babies and others give birth to suspects.

This body, I learned, would produce relatives who were more likely to end up in prison than get a college degree.

There's something about being black in America that makes motherhood seem complicated.

I can't seem to figure out what to do to raise my kids right and keep them alive.

Am I telling my son not to steal because it's wrong to do so or use it to justify his death?

Would I tell him that even if he paid for skittles and sweet tea, there would still be people watching him and trying to see criminals in front of their children? People who call the police without waiting for the police to come.

Do you want the police to come too?

Too many Sean Bells ringing in my head when I try to call 911.

Oscar Grant's opinion that they will not come to kill my son is unacceptable.

So we may have gotten rid of the noose, but I still think killing a black boy and leaving his body out in the sun for four hours is still a lynching.

As a historical reminder that there is something about being black in America that makes motherhood sound like mourning.

One morning, I wake up and see my son as a repeat of last week's story.

I feel like I woke up and realized that my daughter's death wasn't even news.

So Sandra Bland cannot be said to be the only black woman we should be more violent than silenced.

What about the other dark-skinned daughters in distress whose death we still don't remember?

What will happen to our children who do not fit in properly during the life of your gender?

Apparently, nothing is a good protector if you emerge from a body like this.

There is something about being black in America that sounds like something to look forward to being a mother.

I've written so many poems about dead black children that I'm naive about the fact that one day there may be poetry written about my own children.

But I don't want to be the mother who gave birth to poetry.

I don't want a verse for my son, a line for a little girl, and a footnote for a child who doesn't fit into this world.

no.

I don't want children who can't outlive me to live forever in the pages of poetry.

(Applause.) I was invited to the TEDWomen conference to perform a poem.

But for me poetry is not about art or performance.

It's a form of protest.

During rehearsals yesterday, I was told that there have been a couple of recent TED talks on Black Lives Matter.

Maybe we should cut back on TED talks and just focus on reproductive justice.

But that poem and this story are fundamentally about my inability to distinguish between the two.

I was 21 -- (applause) I was 21 when Trayvon Martin was murdered.

A 17-year-old black boy, a black child, Trayvon Martin was a reminder of how little this country actually values ​​black lives.

The hashtag #BlackLivesMatter has become the most popular call for black people and our children to live in safe environments and healthy communities without fear of personal, state or governmental violence.

Months later, when George Zimmerman was not held accountable for the murder of Trayvon Martin, I heard Trayvon Martin's mother Sibrina Fulton speak.

Her testimony had such an impact on me that I found myself constantly wondering what it would mean for this skin-wearing mother in the United States.

For many people who look like me, motherhood is synonymous with grief, so what does motherhood really mean?

Without realizing it, I was beginning to connect the Reproductive Justice framework with the Black Lives Movement.

As I learned more about reproductive justice on Women With A Vision and continued to work with the Black Lives Movement, I wanted others to see and feel these similarities.

I asked myself: Whose job is it in times like these to connect ideas with reality and people?

I would like to dedicate this lecture and that poem to Constance Malcolm.

She is the mother of LaMurley Graham, another previously murdered black child.

Once, as I was struggling to write the poem, at dinner she reminded me that it is the artist's job to unearth stories that people try to bury with the shovels of complacency and time.

Toni Morrison recently said, "In times of terror, an artist should never choose silence.

There is no time for self-pity and no room for fear. ”

Yesterday, during rehearsals, I was momentarily horrified when they said, "Maybe we can cut the Black Lives Matter part from the talk."

The fear that the very stage on which our stories should be told will once again be denied.

Then I remembered what I said earlier.

"In times of terror, an artist should never choose silence.

There is no time to indulge in self-pity.

(Applause.) We have no time for self-pity.

And there is no room for fear. ”

And I made my choice.

And I always choose

thank you.

(applause)

I am a PhD student.

So the question is, how can we make digital content easier to understand?

Because on the one hand there is the digital world, and there is no doubt that there is a lot going on right now.

And for us humans, it is not entirely physical, it is virtual rather than actually there.

On the other hand, we are humans and live in a physical world.

It is thick, has a good taste, feels good, and smells good.

So the question is, how do we move information from digital to physical?

that's my question.

If you look at the iPhone by touch and the Wii by physical movement, you can see this trend. It's getting physical.

The question is what's next?

Well, I have three options and I would like to introduce them.

The first is trout.

As humans, we are sensitive to how heavy an object we are holding is.

So can it be used on mobile phones as well?

Introducing weight transfer mobile.

There is an iron weight inside the mobile phone-shaped box, and you can move it around and feel where it is heavy.

move its center of gravity.

For example, digital content can be enhanced with physical mass.

So you move around the content on the display, but you can also feel where the content is just by the weight of the device.

Another great thing is the navigation.

I can guide you around town.

It's weight tells us, "Okay, go right, walk forward, turn left here."

The nice thing about this is that you don't have to look at your device all the time. Your eyes are free to see the city.

Well, first is the mass, second is the shape.

We are also sensitive to the shape of objects in our hands.

When you download an e-book, if the number of pages is 20, it may be thin.

But if there are 500 pages, I want to feel "Harry Potter" - it's thick.

(Laughs) So let me show you a mobile that changes shape.

This is also a box in the shape of a mobile phone, but this one can change its shape.

Let's play with the shape itself.

For example, it can be thin when you put it in your pocket, which is exactly what we want.

However, when you hold it in your hand, it leans forward and becomes thick.

It feels like it tapers down.

If you change the way you grip it, you can match it.

It's also handy if you put it on your nightstand to watch a movie or use it as an alarm clock.

standing.

Another is that we sometimes see things on our phones that are bigger than the phone itself.

In that case, if you have an app that's larger than your phone's screen, like we have here, the phone's shape might tell you, "Okay, off screen, here's more content."

You can't see it, but it's there. ”

Shape is secondary.

The third works on another level.

As humans, we are sociable and empathetic, and that's great.

Isn't that a way to make mobile phones more intuitive?

Imagine a hamster in your pocket.

Well, it feels, okay. No need to check.

(Laughter) Let me show you a living cell phone.

So, again, a box shaped like a mobile phone.

But it has a breath and a heartbeat and feels very organic.

(Laughter) And you can see that I'm relaxed now.

Oh, now -- a missed call, a new phone call, a new girlfriend, maybe -- I'm super excited.

(Laughter) How can I calm down?

A dab behind the ear restores everything.

It's very intuitive and that's what we want.

We've seen three ways we can make digital easier for us to grasp.

I think doing it physically is a good way.

The hypothesis behind it. This is not to say that humans should become more technologically advanced in the future. More technology than that, a little more human.

(applause)

Hindus say 'Nada Brahma', one translation of which is 'The world is wholesome'.

In a way it is true because everything vibrates.

In fact, all of you sitting here now are vibrating.

Each part of the body vibrates at different frequencies.

So really you are a chord and each of you is an individual chord.

One definition of health may be that the chords are in perfect harmony.

Your ears don't hear the chords. They can actually hear amazing things. Your ears can hear 10 octaves.

By the way, you can only see one octave.

The ears are always on and there are no ear flaps.

Works even when you're asleep.

The smallest sound you can perceive causes your eardrum to move just four times the size of an atomic diameter.

The loudest sound you can hear is a trillion times more powerful than that sound.

Ears are made to hear, not to hear.

Listening is an active skill, hearing is passive, listening is something we have to work with and it's relationship with sound.

But it's a skill none of us are taught.

For example, have you ever thought that there are listening positions and places where you can hear?

Here are two of them.

Reductive listening is listening “for”.

Narrow everything down to what's relevant and discard everything that's irrelevant.

Men usually listen reductively.

So he says, "I have this problem."

He says, "This is the solution. Thank you. Next."

That's how we talk, right?

Expanded listening, on the other hand, is listening 'with' rather than 'for'.

No destination in mind, just enjoy the journey.

Women are usually open-minded listeners.

If you look at these two people, they're making eye contact, facing each other, and probably both talking at the same time.

(Laughter) Men, if you don't get anything out of this story, practice listening extensively. Then you can change your relationships.

The problem with hearing is that much of what we hear is the noise around us all the time.

According to the European Union, such noise reduces the health and quality of life of 25 percent of the European population.

Two percent of the European population, or 16 million people, have their sleep disrupted by such noise.

Noise kills 200,000 people a year in Europe.

That's a really big problem.

Now, when I was a kid, I used to stick my fingers in my ears and hum if there was noise and I didn't want to hear it.

These days, you can do something similar, but with a slightly cooler look.

It's kind of like this.

The problem with headphone ubiquity is that it poses three very big health problems.

The first really big health problem is 'schizophrenia', a term coined by Murray Shaffer.

It's the gap between what you see and what you hear.

In other words, we invite voices into our lives that are not there.

I think there is something very unhealthy about living with schizophrenia all the time.

A second problem with headphone abuse is compression.

We squish music into our pockets, and this comes at a cost.

Listen to this -- this is uncompressed music.

(music) And now the same music with 98 percent of the data removed.

(music) I hope someone can at least hear the difference between the two.

Compression has a cost.

Having to create all the data is tiring and frustrating.

Please try to imagine.

It's not good for you in the long run.

A third problem with headphones is hearing loss, or noise-induced hearing loss.

For some reason, 10 million Americans already suffer from this condition, but most alarmingly, 16 percent of American teenagers, or roughly 1 in 6, suffer from noise-induced hearing loss from headphone abuse.

A study conducted at an American university found that 61% of college freshmen have hearing impairment due to headphone abuse.

We may end up raising an entire generation of deaf people.

Now it's a really serious problem.

Here are 3 simple tips to protect your ears and pass it on to your kids. please.

Professional hearing protection is great. I use some all the time.

If you do use headphones, buy the best you can afford, because good quality means you don't have to make them that loud.

If you can't hear someone talking too loud, it's too loud.

Third, if the sound is bad, it's okay to put your finger in your ear or away from your ear.

So protect your ears.

Stay away from the bad sounds and take a look at the friends you want to find.

WWB: Wind, Water, Birds -- Stochastic natural sounds composed of many discrete random occurrences. All of it is very sound and all sounds we have evolved over the years.

Find those sounds. They are good for you, so this is fine.

Silence is beautiful.

The Elizabethan era described language as embellished silence.

We encourage you to step away from silence with intention and design your soundscape like a work of art.

Arrange the foreground and background all in a beautiful balance.

Designing with sound is fun.

If you can't do it yourself, ask a professional.

I think sound design is the future and that's how we change the way the world sounds.

Briefly describe 8 modalities, or 8 ways sound can improve your health.

The first is ultrasound. We are familiar with physical therapy. It is now also used to treat cancer.

Lithotripsy -- Breaking up stones with high-intensity sound saves thousands of people from scalpels each year.

Sound healing is a wonderful therapy.

It has existed for thousands of years.

Please consider this.

There is great work being done there in the treatment of autism, dementia and other diseases.

And of course music. Generally speaking, if it's made with good intentions, made with love, then just listen to the music.

Godly music, nice, Mozart, nice.

Very healthy music has all kinds of music.

And four ways you need to take some action and get involved.

First, listen consciously.

I hope you will do the same after this talk.

It's a whole new dimension to your life and it's great to have that dimension.

Then work on making sounds and make sounds.

The voice is the instrument we all play, but how many of us are trained to use it? Get trained. Learn to sing, learn to play an instrument.

Musicians have big brains – it's true.

This can also be done in groups.

It's a great antidote to schizophrenia. You can create music and sounds as a group, especially in your favorite style.

And let us play a role in managing the sounds around us.

protect your ears? that's right.

Beautifully design ambient soundscapes at home or at work.

And when people are attacking us with the noise that I played you early on, let's start speaking up.

So here are seven things you can do right now to improve your health with sound.

My vision is a world that sounds beautiful, and if we all start doing these things, we'll be taking a very big step in that direction.

So I urge you to go down that path.

Let me hear the birds chirping a little more. that's very good for you.

We wish you good health.

(applause)

I got up at 6:10 am this morning.

After going to bed at 12:45 am

I woke up once during the night.

My heart rate was 61 beats per minute and my blood pressure was 127 over 74.

Since I had zero exercise time yesterday, my maximum heart rate during exercise was not calculated.

I had about 600 milligrams of caffeine and zero alcohol.

And my score on the Narcissistic Personality Index (NPI-16) is a reassuring 0.31.

We know numbers help us advertise, manage, govern and search.

We talk about how they help us when we want to reflect, learn, remember, and improve.

A few years ago, my partner Kevin Kelly and I found that people were exposing themselves to a regime of quantitative measurement and self-tracking that went well beyond the normal, familiar habit of stepping on the scale every day.

People were tracking their food on Twitter and their kids' diapers on their iPhones.

They kept detailed diaries of their spending, moods, symptoms, and treatments.

We now know some of the technological facts driving this change in our lifestyles, such as the prevalence and pervasiveness of mobile devices, breakthroughs in data storage and data processing, and remarkable advances in human biometric sensors.

This little black dot is a 3D accelerometer.

Track your movements in space.

As you can see, it's very small and very cheap.

Now prices have dropped well below $1 apiece and they are used in all kinds of devices.

But what's interesting is the incredibly detailed information you can get from just one sensor like this.

This kind of sensor is found in Fitbit, a biometric device that is currently a hit among early adopters.

This will also track your activity and sleep.

It has that exact sensor.

You are probably familiar with the Nike+ system.

I just put this because that little blue dot is the sensor.

It's really just a pressure sensor like you'd find in a doorphone.

And Nike knows how to tell pace and distance from that sensor alone.

This is the strap you use to send your heart rate data to the Nike+ system.

It's a beautiful new device that provides detailed sleep tracking data, not just whether you're asleep or awake, but also sleep stages such as deep sleep, light sleep and REM sleep.

The sensor is a small piece of metal in the headband.

The rest are bedside consoles. For reference, this is a sleep tracking system from just a few years ago, which means it's still up to now.

This is today's sleep tracking system.

It was just announced at the Healthcare Conference in Washington DC.

Most of what you have there is an asthma inhaler, but on top is a tiny GPS transceiver that tells you when and where your asthma flare-up occurred, giving you a newfound awareness of your vulnerability to time and environmental factors.

Now we know new tools are changing our sense of self in the world. These tiny sensors that collect data in nature, the ubiquitous computing that allows us to understand and use that data, and of course social networks that allow people to collaborate and contribute.

However, while we think of these tools as outward facing windows, we would also like you to think of them as inward facing mirrors.

So when we think about using them to make systematic improvements, we also think about how they can help with self-improvement, self-discovery, self-awareness, and self-awareness.

This is a biometric device, the Apple Earbuds.

Last year, Apple filed several patents for getting blood oxygenation, heart rate, and body temperature via earbuds.

what is this for?

what should it be for?

Some would say it's for biometric security.

Some would say it's for public health research.

Some would say it's for avant-garde marketing research.

I would like to tell you that it is also to know yourself.

And self is not everything. It's not even most things.

The self is the very center of our activity, our consciousness, our moral compass.

Therefore, if we want to act more effectively in the world, we need to know ourselves better.

thank you.

We live in a wonderful time, the age of genomics.

A genome is the entire sequence of DNA.

Your order and mine are slightly different.

That's why we look different.

I have brown eyes. There may be blue or gray.

But it's not just superficial.

Headlines tell us that genes can cause horrific diseases, in some cases they can shape our personalities, or they can cause mental disorders.

Our genes seem to have great power over our destinies.

Still, I like to think I'm beyond my genes.

What do you think, guys?

Are you beyond your genes?

(Audience: Yes.) Yes?

I think some people agree with me.

I think we should make a statement.

I think it should be said all together.

got it. "I am beyond my genes."-All together.

Everyone: I'm more than just genes.

(cheers) Sebastian Sun: What am I?

(Laughter) I am my Connectome.

Now, you guys are so awesome that you might as well humor me along.

(laughs) Yes. all together now.

Everyone: I am my Connectome.

SS: That was great.

As you know, you guys are very smart and willing to play with me even though you don't even know what the Connectome is.

You can go home now.

Well, so far only one connectome for this tiny worm is known.

Its modest nervous system consists of just 300 neurons.

And in the 1970s and 80s, a team of scientists mapped all 7,000 connections between neurons.

In this diagram all nodes are neurons and all lines are connections.

This is the connectome of the nematode C. elegans.

The connectome is much more complex than this, as the brain contains 100 billion neurons and 10,000 times more connections.

You have this diagram in your brain, but it doesn't fit on this slide.

The connectome contains a million times more connections than the letters of the genome.

That's a lot of information.

What does that information contain?

I don't know for sure, but I have a theory.

Since the 19th century, neuroscientists have speculated that perhaps your memories, the information that makes you who you are, are stored in connections between neurons in your brain.

And perhaps other aspects of your personal identity, perhaps your personality and intelligence, are probably also encoded in the connections between your neurons.

Now you know why I proposed this hypothesis. I am my connectome.

I did not ask you to recite this because it is true. I just want you to remember.

And in fact, we don't know if this hypothesis is correct, because the technology doesn't yet exist that is powerful enough to test it.

It took more than a decade of tedious work to discover the worm's connectome.

And to find connectomes in the brain that are more like us, we need automated, more sophisticated technologies that speed up the process of finding connectomes.

In the next few minutes, I'll discuss some of these technologies currently under development in my lab and my collaborators' labs.

Well, you've probably seen pictures of neurons before.

It is immediately recognizable by its wonderful shape.

It has long and delicate branches, and in a nutshell, it looks like a tree.

But this is just a single neuron.

To find the connectome, we need to look at all neurons simultaneously.

Now let's meet Bobby Kastri, who works in Jeff Lichtman's lab at Harvard University.

Bobby has a surprisingly thin slice of mouse brain.

And I zoomed in by 100,000x to get the resolution so I could see all the neuron branches at the same time.

However, it may not actually be recognized. Because we need to work in 3D.

By taking many images of many slices of the brain and stacking them together, you get a three-dimensional image.

Still, you may not be able to see the branches.

So, starting at the top, I color the cross-section of one branch red, then do the same with the next slice and the slice after that.

And we continue it from slice to slice.

As we continue to process the entire stack, we can reconstruct the 3D shape of small fragments of neuron branches.

And we can do that for another neuron in green.

And you can see that the green neuron makes two contacts with the red neuron. These are called synapses.

Let's zoom in on one synapse and look inside the green neuron.

You should see a small circle. These are called vesicles.

They contain molecules known as neurotransmitters.

And when the green neuron wants to communicate, when it wants to send a message to the red neuron, it spits out neurotransmitters.

At a synapse, two neurons are said to be connected like two friends talking on the phone.

Now you know how to find synapses.

How can we find the entire connectome?

Now treat this stack of 3D images as a giant 3D coloring book.

Color all neurons with different colors, go through all images to find synapses, and note the color of the two neurons that each synapse contains.

If we could do this across all images, we would be able to find the connectome.

Well, at this point you've learned the basics of neurons and synapses.

So, I think I'm ready to tackle one of the most important questions in neuroscience: How are male and female brains different?

(Laughter) According to this self-help book, a man's brain is like a waffle. They've boxed their lives into boxes.

A girl's brain is like spaghetti. Everything in their life is connected with everything else.

(Laughter) People are laughing, but this book changed my life.

(Laughter) But seriously, what's wrong with this?

You already know enough, so please let me know. What is wrong with this statement?

Everyone's brain is like spaghetti, male or female.

Or maybe a really, really nice cappellini with branches.

One neuron contacts many others through its entwined branches, just as one thread on spaghetti contacts many others on a dish.

One neuron can connect to many other neurons because synapses can exist at these contacts.

By now, you may have lost sight of how big this cube of brain tissue really is.

Now let's do a series of comparisons.

I assure you, this is very small. A side is only 6 microns.

So here's how this stacks up for the whole neuron:

And it turns out that in fact this cube contains only the smallest pieces of branches.

And neurons are, well, smaller than the brain.

It's just a mouse brain, much smaller than a human brain.

So, when I show this to my friends, sometimes they say, "Sebastian, you should give up now."

Neuroscience is hopeless. ”

Because the unaided eye hides the complexity of the brain, but the microscope finally reveals the hidden complexity.

In the 17th century, mathematician and philosopher Blaise Pascal wrote about the fear of infinity and the insignificant feeling of contemplating the vastness of space.

Besides, as a scientist, I shouldn't talk about my feelings. Too much information, professor.

(laughs) But, okay?

(Laughter) (Applause) I'm curious, I'm curious, and sometimes I feel hopeless.

Why would I want to study this organ, so marvelous in its complexity that it is almost limitless?

It's absurd.

How can we dare think that we might understand this?

Still, I continue with this odd attempt.

And indeed, lately I have a new hope.

One day microscopes will capture every neuron and every synapse in vast image databases.

And someday, artificial intelligence supercomputers will be able to analyze images and summarize them into connectomes without human assistance.

We don't know, but we live to hope that day will come, because discovering the entire human connectome is one of the greatest technological challenges of all time.

It takes generations of effort to succeed.

At the moment, my collaborators and I are only aiming for something more modest: finding partial connectomes in small blobs of mouse and human brains.

But that's still enough for a first test of this hypothesis that I am my connectome.

For now, I hope I can convince you of the validity of this hypothesis, and that it is indeed worth taking seriously.

A person's identity slowly changes as they grow in childhood and age into adulthood.

Similarly, all connectomes change over time.

What changes will occur?

Well, neurons, like trees, can grow new branches and lose old ones.

Synapses can be created or deleted.

And the synapses can grow, or they can get smaller.

Second question: What causes these changes?

Well, it's true.

To some extent, they are programmed by genes.

But that's not all. There are electrical signals that travel along the branches of neurons and chemical signals that jump from branch to branch.

These signals are called neural activity.

And evidence abounds that neural activity encodes our thoughts, emotions, perceptions, and mental experiences.

And there's plenty of evidence that neural activity can trigger changes in connectivity.

Taken together, these two facts mean that your experiences can change your connectome.

And that is why all connectomes are unique, even those of genetically identical twins.

The connectome is where nature and nurture meet.

And it may be true that the mere act of thinking can change your connectome, an idea that empowers you.

What's in this photo?

I call it a cool, refreshing stream of water.

What else is in this photo?

Let's not forget the grooves in the earth called riverbeds.

Without it, we don't know which direction the water will flow.

And with regard to this stream, I would like to propose a metaphor for the relationship between neural activity and connectivity.

Neural activity is constantly changing.

It's like water in a stream. it never stands still.

The connections in the brain's neural networks determine the pathways through which neural activity flows.

A connectome is therefore like a river bed. But this metaphor is richer than that. Because, while it is true that riverbeds guide water flow, over long timescales water also changes the shape of riverbeds.

And, as I mentioned earlier, neural activity can alter the connectome.

And if you'll allow me to get to metaphorical heights, I'd like to remind you that neural activity is, or is what neuroscientists think, the physical basis of thought, emotion, and perception.

And we might also be able to talk about stream of consciousness.

Neural activity is its water and the connectome is its bed.

So let's go back from the heights of metaphor and back to science.

Suppose our technology for finding connectomes does indeed work.

How do we test the hypothesis that "I am my connectome"?

Well, I suggest testing directly.

Let's read memories from the connectome.

Consider the memory of a series of movements over time, like a pianist playing Beethoven's sonatas.

According to theories dating back to the 19th century, such memories are stored in the brain as chains of synaptic connections.

Because when the first neuron in the chain is activated, it sends a message through the synapse to the second neuron, which activates, and so on, like a chain of falling dominoes.

This sequence of neural activation is then hypothesized to be the neural underpinnings of the movement sequence.

So one way to test the theory is to look for such chains within the connectome.

But it's not easy. because they will not be like this.

they will be confused.

Therefore, a computer must be used to unscramble the chain.

And if we can, the order of neurons recovered from that descrambling will be a predictor of the pattern of neural activity replayed in the brain during memory retrieval.

And if it succeeds, it will be the first example of reading memory from the connectome.

(Laughter) What a mess -- have you ever tried to connect a system this complicated?

I hope not.

But if you do, you know how easy it is to make mistakes.

Neuron branches are like wires in the brain.

can anyone guess? What is the total length of the wiring in your brain?

I will give you a hint. That's a big number.

(Laughter) I think you have millions of miles in your skull.

And if you appreciate this number, it's easy to see how it's very possible to miswire your brain.

And indeed, the popular press likes headlines like "Anorexic Brains Are Wired Differently" and "Autistic Brains Are Wired Differently."

These are plausible claims, but in practice we can't see the brain wiring clearly enough to determine if these are really true.

And the technology to see the connectome will eventually be able to read the miswiring of the brain and confirm the mental illness of the connectome.

Sometimes the best way to test a hypothesis is to consider its most extreme implications.

Philosophers are familiar with this game.

If you believe that I am my Connectome, I think you must also accept the idea that death is the destruction of your Connectome.

I mention this because there are prophets today who claim that technology will fundamentally change the human condition and perhaps even the human species.

One of their most cherished dreams is to cheat death through a method known as cryopreservation.

For $100,000, you can have your body frozen after death and stored in liquid nitrogen in one of these tanks in a warehouse in Arizona, waiting for an advanced future civilization to rise again.

Should we ridicule modern people who seek immortality by calling them idiots?

Or will they one day laugh on our graves?

I don't know -- I prefer to test their beliefs scientifically.

I propose to find the frozen brain connectome.

Damage to the brain has been found to occur postmortem and during freezing.

The question is, did the damage erase the Connectome?

If so, there is no way future civilizations can recover these frozen brain memories.

The resurrection may be successful for the body, but not for the mind.

On the other hand, if the connectome is still intact, cryogenic claims cannot be so easily ridiculed.

He described a quest that begins in a very small world and propels us into the distant future.

The Connectome will be a turning point in human history.

When we evolved from our ape-like ancestors in the African savannah, our hallmark was a larger brain.

We've put our heads together to create better technology than ever before.

Ultimately, these technologies will become so powerful that we will use them to know ourselves by dismantling and rebuilding our brains.

We believe this journey of self-discovery is not just for scientists, it's for all of us.

And thank you for giving me the opportunity to share this voyage with you today.

thank you.

(applause)

So, I would like to share with you an inspiring story about working with hopelessness, depression and hopelessness in Afghanistan and what we have learned from it and how we can help people overcome traumatic experiences and regain confidence in the time ahead, in the future and how to rejoin daily life.

So, I, a Jungian psychoanalyst, happened to be in Afghanistan in January 2004 on a Medica Mondial mission.

Jung in Afghanistan -- You know the situation.

Afghanistan is one of the poorest countries in the world, with 70 percent of the population illiterate.

War and malnutrition kill people along with hope.

You may know this in the media, but you may not know it. The average age of Afghan people is 17 years old. So they grew up in that environment and, again, 30 years of war.

This therefore leads to ongoing violence, foreign interests, bribery, drugs, ethnic conflicts, poor health, shame, fear and accumulated traumatic experiences.

Local and foreign militaries are to work with donors and governmental and non-governmental organizations to build peace.

And while people certainly had hope, it's because they keep getting killed, or for some reason they're poorer than they were eight years ago, until they realize their situation is getting worse by the day.

One of those numbers is that 54 percent of children under the age of five are malnourished.

Still, there is hope.

One day a man said, "My future is not bright, but I want my son to have a bright future."

This is a picture I took walking on the hills of Kabul on a Friday in 2005, and for me it symbolizes the open future for the younger generation.

Then the doctor prescribes the medicine.

And donors are supposed to bring peace by building schools and roads.

The military will withdraw their weapons and the depression will remain.

why?

Because people don't have the tools to deal with it and get over it.

So upon arrival, I confirmed what I already knew. My instruments come from the heart of modern Europe, yes.

But what hurts us and how we react to that hurt is universal.

And the big challenge was how to make sense of the symptoms in this particular cultural context.

After counseling, one woman said, "You made me feel, so I felt myself, and I wanted to be involved in family life again."

This was very important as the family is central to the Afghan social system.

No one should live alone.

And when people feel used, worthless, and ashamed because something terrible has happened to them, they retreat, fall into social isolation, and do not dare to tell others or loved ones about this vice because they do not want to be a burden.

And very often violence becomes the way to deal with it.

Traumatized individuals are also more likely to lose control and develop symptoms such as hyperarousal and memory flashbacks, leaving them in constant fear of the unexpected and sudden return of the terrifying emotions of the traumatic event, which they are unable to control.

To compensate for this loss of internal control they try to control the outside, which is quite understandable, mainly the family, but unfortunately this applies very well to the traditional, regressive, repressive and restrictive aspects of the cultural context.

So husbands start beating their wives, mothers and fathers beat their children, and then they feel terrible.

They didn't want this, it just happened. they lost control.

People desperately try to restore order and normality, but if we do not break this cycle of violence, it will undoubtedly be passed on to the next generation.

And partly, this has already happened.

So everyone needs a sense of the future, but Afghans' sense of the future is shattered.

But let's repeat the words of the woman.

"You made me feel so I can feel myself again."

So empathy is key here.

Someone has to witness what happened to you.

Someone has to feel what you feel.

And someone has to meet you and listen to you.

Everyone should be able to know that what they have experienced is true, but this is only true for others.

So everyone has to say, "This happened to me and it got me through this stuff, but I can live with it, deal with it and learn from it."

And I want to do my best for the bright future of my children and my children's children, and I have no intention of marrying my 13-year-old daughter.”--that happens all too often in Afghanistan.

So even in extreme environments like Afghanistan, something can be done.

And then I started thinking about a counseling program.

But, of course, they needed help and money.

And one evening I was sitting next to a very nice gentleman in Kabul and he asked me what I thought was good in Afghanistan.

And I immediately explained to him that I was going to train psychosocial counselors and open a center and why.

This man gave me his contact information at the end of the night and said, "Call me if you want to do this."

At that time, he was the head of German Caritas.

So I was able to set up a three-year project with Caritas Germany, training 30 Afghan women and men and opening 15 counseling centers in Kabul.

This was our billboard. It was hand-painted and had 45 locations throughout Kabul.

11,000 came - exceeded.

And 70% recovered their lives.

It has been a very exciting time developing this with my amazing Afghan team.

And they are still working with me to this day.

We have developed a culturally sensitive psychosocial counseling approach.

So from 2008 to today there have been great changes and advances.

The European Union delegation in Kabul got involved in this and hired me to work within the Ministry of Public Health to lobby for this approach. we succeeded.

We revised the mental health component of primary health care services by adding psychosocial care and psychosocial counselors to the system.

This certainly means retraining all medical staff.

But for that we already have a training manual, which has been approved by the ministry, and this approach is now part of Afghanistan's mental health strategy.

So we have already implemented it in some selected clinics in 3 states and you will be the first to see the results.

We wanted to know if what is currently being done is effective.

And here we see that all the patients had symptoms of moderate and severe depression.

And the red line is treatment as usual, i.e. medication by a doctor.

And the symptoms all stayed the same or got worse.

And the green line is treatment with psychosocial counseling only, without drug therapy.

And we find that the symptoms have almost completely disappeared and the psychosocial stress is greatly reduced. This is explainable because you can't get rid of psychosocial stress, but you can learn to deal with it.

We also have proof that this is working, so that's great.

This is a medical facility in northern Afghanistan, and every morning it's like this everywhere.

And while a doctor typically sees a patient in 3-6 minutes, that's about to change.

They go to the clinic because they want to cure their immediate symptoms. Then find someone to talk to about these issues, talk about what's weighing on you, find solutions, develop resources, learn tools to resolve family conflicts, and gain confidence in the future.

And I would like to share one short episode.

One Hazara told a Pashtun counselor, "If we had met a few years ago, we would have killed each other.

And now you are helping me regain my confidence for the future. ”

And another counselor said to me after the training: "I had no idea why I survived the massacre in my village, but now I know because I am part of the core of Afghanistan's new peace society."

So I think this kept me going.

And this is a truly liberating and political contribution to peace and reconciliation.

And also, I think, without psychosocial therapy, and without taking this into account in all humanitarian projects, civil society cannot be built.

I thought this was an idea worth spreading, and I think it could and could be replicated elsewhere.

Thank you for your attention.

(applause)

On a beautiful day just a few years ago, my wife and I entered a hospital near our home in Oakland, California, for the birth of our first daughter, Maya.

We had toured the maternity home responsibly beforehand, but somehow we were still amazed to be in a place where we would experience one of the most important moments of our lives.

We were trapped in a windowless room with no hint of a bright sunny day left.

Fluorescent lights blared overhead, the paint on the walls was beige, and a machine beeped inexplicably as the wall clock indicated the change from day to night.

The clock stood above the door in direct view from where my wife lay as her labor pains intensified by the hour.

Now, I've never given birth (laughs), but she assured me that what a woman in labor never wants to do is watch the seconds tick by.

(Laughter) As an architect by training, I've always been fascinated by seeing people experience design in the world around them.

We believe the design works like a soundtrack is playing that we are not fully aware of.

It sends us subconscious messages about how to feel and what to expect.

The room we were in seemed completely out of touch with the moment we were experiencing, the moment we welcomed a human being, our daughter, into this world.

One time, without any prompting, a nurse turned to us and said, "I always think, 'I wish I was an architect, I could have designed this room better.'" I told her, "This room was designed by an architect."

(Laughter) The birth of my daughter was an immeasurable joy, but the message in that hospital room still sticks in my mind with my daughter.

Their message is, "You are not at home, you are in a foreign place."

"You can't control anything.

Not even lighting. ”

"Simply put, your comfort is secondary."

Such hospital rooms may, at best, be described as uninteresting or simply ignored.

At worst, it lacks grace.

And I use this term to point out that no one in the world is immune from bad design.

I went into architecture because I believed it was about creating spaces for people to live their best lives.

But what I discovered were occupations that had little to do with the people most directly affected by the work.

I believe this is because architecture remains an elitist profession for white men, seemingly indifferent to some of the greatest needs in the world and even the relatively simple needs of an expectant mother.

Students are trained in school using highly theoretical projects, but they rarely interact with real people or real communities.

Graduates follow the long, narrow and unforgiving road to licensure.

This expert, on the other hand, wins over a select few through a relentless awards program that focuses almost exclusively on the aesthetics of buildings rather than their social impact and contributions.

It only reinforces a distorted view of professional responsibility and success, but this is not why many hopeful young people go into the construction industry.

That's not why I did it.

At the time, I didn't have the language to express it, but I believed that design had a unique ability to bring dignity. And now we know.

It can make people feel valued, respected, honored and recognized.

Now I want you to think about some of the spaces you live in.

And I want you to think about what emotions they bring to you.

Now, there are places that make us feel unhappy, unhealthy, or uninspiring.

It could be where you work, where you heal, or even where you live.

So I ask how could these places be better designed with you in mind.

This is a really simple question, but for some reason it can be very difficult to answer.

Because we are conditioned to feel less subjective to the spaces and places in which we live, work, and play.

And in many cases it is not.

But we all should.

Now for the ladies watching this, a stupid question. Have you ever stood in a disproportionately long toilet line?

(laughs) Have you ever wondered, "What's wrong with this picture?"

So what if the real question was, "What's wrong with the man who designed this bathroom?"

(Applause.) It may seem like a small thing, but it represents a much bigger problem.

The modern world was literally built by people who took little time to understand how people who were different from them experienced their designs.

A long line for the bathroom might seem like a bit of an insult.

But the opposite is also true.

Thoughtful design can make people feel respected and noticed.

I have come to believe that dignity is about designing what justice is to law and health to medicine.

In the simplest terms, make the space you live in reflect your values.

Over the past two years, I have had the opportunity to interview over 100 people from all walks of life about their design experience.

I wanted to test my intuition that class and design have a unique relationship.

I spoke with Gregory, a resident of this cottage community designed specifically for the 50 most chronically homeless people in Dallas.

For over 30 years, Gregory has been living on the streets, drifting from town to town.

An extensive collaboration of social services agencies, funders and designers has created this place.

Each 400 square foot cottage is beautifully designed as a permanent residence.

Gregory now has the key to his own door.

He talks about the peace of mind it brings.

What he has lived without for 30 years.

When he arrived fully clothed, everything was waiting for him, from toasters, crockpots and stoves to toothbrushes and toothpaste.

He simply describes it as Heaven.

We spoke with Ms. Antoinette, director of a training and community center for women in rural Rwanda halfway around the world.

Hundreds of women come to this place every day. To learn new skills, join the community, and continue to rebuild life after the civil war.

These women literally pressed the 500,000 bricks that make up 17 such classroom pavilions.

Antoinette said, "Everyone is very proud of it."

And here in the United States, I spoke with Monica, director of a free clinic that serves primarily the uninsured in Arkansas.

Monica loves to tell me that the doctors who volunteer at her free clinic regularly say that it's the first time they've worked in such a beautiful, light-filled place.

Monica believes that even those living in poverty should have access to quality healthcare.

Moreover, she believes they deserve that care in a dignified environment.

Such people are valuable ambassadors of design, yet they have largely disappeared from the discussion of architecture.

Similarly, those who benefit most from good design often have the least access to it.

Your cousin is a homeless veteran. Grandpa and grandma who live in a house where the kitchen is no longer available. A sister in a wheelchair who lives in a suburban area with no sidewalks.

What good is good design if it is reserved for a privileged few?

It's time for designers to change this by devoting their practice to the public good, building on the models of companies like Orkidstudio, Studio Gang and MASS Design Group.

Their customers are orphans in Kenya, foster children in Chicago and pregnant women in Malawi.

Their practice is based on the belief that everyone deserves good design.

Dedicating more practice to the public good not only creates more dignified design, but it also dignifies the practice of design.

This will not only diversify the customer base for design, but also create a new and more diverse form of design in the world.

Now, to make this happen, my architects and design friends, especially my fellow white men, we need to simultaneously and significantly diversify our classes.

If you want the public to believe that design is for them and for everyone.

Today, only 15 percent of registered architects in the United States are women.

And the percentage of people of color is much smaller.

Other professions, such as law and medicine, have made much greater progress in these important areas.

If women and people of color were involved in half the proverbial blueprint, how would our shared built environments — homes, hospitals, schools, public spaces — look different?

It's not a question of how beautiful, less functional, less fair, less dignified our buildings, landscapes, cities and rural communities are because women and people of color are less likely to make them.

When Winston Churchill called for the reconstruction of London's war-damaged Houses of Parliament in 1943, he famously said, "We shape the building, and afterward the building shapes us."

The good news is that you can change how you build and what you build for.

Whether it's a rural health worker in Rwanda or a nervous new father at a birth mother in the United States.

We can do this by recommitting architecture to public health, safety and welfare.

This pays dividends.

Because once you see what a design can do, you can't ignore it.

And once you experience dignity, anything less is unacceptable.

Both are part of your potential.

One of my favorite conversation partners is Audrey Gowitz, my 90-year-old grandmother from Oshkosh, Wisconsin.

After talking about the design, she wrote me a letter.

She said, "Dear Johnny, I was sitting in the doctor's office the other day thinking how depressing everything was from the color of the walls to the carpet on the floor.

(laughter) Now I have to call and see who is responsible for the drabness of the place. ”

(Laughter) In the same letter, just to be sure, she said, "I actually called and called the person in charge, and he said thank you for someone calling.

My clinic is on the list for upgrades. ”

(Laughter) She signed it saying, "It's always good to express your opinion when done the right way."

(Laughter) (Applause) I love my grandma.

(laughter) Like my grandmother Audrey, you deserve good design.

Because a well-designed space is not just a matter of taste or aesthetics.

They literally shape our idea of ​​who we are in the world and what we deserve.

That is the essence of dignity.

And it is both an opportunity and a responsibility to design for the good and whole.

thank you.

(applause)

At 21 minutes of speaking time, two million years feels like a long time.

But evolutionarily, two million years is nothing.

But in the space of two million years, the mass of the human brain has nearly tripled, growing from the 1.5-pound brain of our ancestor Habilis here to the nearly 3-pound meatloaf that everyone here tucks between their ears.

What is the big brain that nature so craved to have in all of us?

Well, it turns out that when the brain triples in size, it's not just three times bigger. They acquire new structures.

One of the main reasons our brains have gotten so big is because we've added new areas called "frontal lobes," specifically the "prefrontal cortex."

What does the prefrontal cortex do for you that justifies rethinking the entire structure of the human skull in the blink of an evolution?

Well, it turns out that the prefrontal cortex does many things, but one of the most important is that it is an experience simulator.

Pilots practice on flight simulators to avoid making mistakes.

Humans have an amazing adaptability that allows them to get hands-on experience in their heads before trying it out in real life.

This is a trick that none of our ancestors could do, and no other animal can do it like us.

That's a great adaptation.

It has an opposable thumb, stands upright, and language is one of the things that took our seed from the tree to the mall.

(Laughter) You've all done this before.

Ben and Jerry's does not have "liver and onion" ice cream.

Because you can simulate that flavor and say 'hmm' before you make it without leaving your armchair.

Let's see how the Experience Simulator works.

Before proceeding with the rest of the story, let's run a quick diagnostic.

Now think about two different futures.

Try them out and tell us which one you prefer.

One of them is winning the lottery. This is approximately $314 million.

And another is becoming paralyzed.

(Laughter) Just think about it.

You probably feel like you don't have to think a little.

Interestingly, we have data on these two groups of people, data on how happy they are.

And this is exactly what you were expecting, isn't it?

But they are not data. I made these!

These are the data.

You failed the quiz and it's been less than 5 minutes since the lecture started.

Because of the fact that a year after losing the use of a leg, a year after winning the lottery, and a year after winning the lottery, lottery winners and paraplegics are equally satisfied with their lives.

If you failed your first pop quiz, don't despair too much. Because everyone fails all pop quizzes all the time.

The research my lab has been doing, and the research that economists and psychologists across the country have been doing, has revealed something truly amazing to us. It's called "impact bias," and it's the tendency of simulators to misbehave and trick you into believing that different results are different than they actually are.

From field studies to laboratory studies, we find that winning or losing an election, making or losing a lover, getting a promotion or not, passing or failing a college exam has much less influence, intensity and duration than people expect.

A recent study showing how a major trauma in life affects people suggests that if it happened more than three months ago, it has no effect on your well-being, with very few exceptions.

why?

Happiness can be synthesized.

Sir Thomas Browne wrote in 1642, "I am the happiest man who lives.

Within me is the power to turn poverty into wealth and adversity into prosperity.

I am more invincible than Achilles. Not a single place where luck strikes me. ”

What amazing machine is in this man's head?

Well, it turned out to be an amazing machine, exactly like the one we all have.

Humans have what appears to be a "psychological immune system", which is a system of cognitive processes, mostly non-conscious cognitive processes, that help us change the way we see the world and feel better about the world we are in.

You have this machine, just like Sir Thomas.

Unlike Sir Thomas, you don't seem to know that.

We synthesize happiness, but we believe that happiness is something we find.

Now, I don't think I need to give too many examples of people synthesizing happiness, but I'll give you some experimental evidence.

You don't have to look far to find evidence.

I grabbed a copy of The New York Times and tried to find some examples of people synthesizing happiness.

Here are three men who combine happiness.

"Physically, financially, and mentally I feel better..."

"I have no regrets. It was a great experience."

"I believe it turned out for the best."

Who are these happy characters?

The first is Jim Wright.

Some of you may remember. He was Speaker of the House, but resigned in disgrace when a young Republican named Newt Gingrich learned of a dubious book deal he had made.

he lost everything.

The country's most powerful Democrat has lost everything. I lost money and power.

After all these years, what does he have to say about it?

“I am much better physically, financially, mentally, and in almost every other way.”

Is there a better way?

vegetable? minerally? animalistically?

He pretty much covers them there.

I've never heard the name Molly's Become.

Molly's Became said these words upon her release.

he was 78 years old.

He spent 37 years in Louisiana State Penitentiary on a false charge.

He was eventually [released midway through his sentence for good behavior]. What did he have to say about his experience?

"I have no regrets. It was a great experience."

wonderful!

This person isn't saying, "There were some nice people, they had a gym."

"Wonderful" -- the word we usually reserve for things like religious experiences.

Harry S. Langerman said:

He's someone you might know, but you didn't. Because in 1949 he read a small article in the newspaper about a hamburger stand named McDonald's owned by these two brothers.

And he thought, "That's a really great idea!"

So he went looking for them.

They said, "For $3,000, we can offer the franchise rights on this."

Harry returned to New York and asked his brother, an investment banker, to lend him $3,000, but his immortal words were, "You idiot, no one eats a hamburger."

He didn't lend him any money.

Six months later, of course, Ray Kroc had the exact same idea.

After all, people actually eat burgers, which is why Ray Kroc briefly became the richest man in America.

And finally, some of you may recognize this young photo of original Beatles drummer Pete Best, but as you know, the Beatles sent him on an errand and sneaked off to pick up Ringo while he was on tour.

Well, when Pete Best was interviewed in 1994, yes, he's still a drummer. Yes he is a studio musician. he said: "I'm happier than when I was with the Beatles."

Well, there are important things to learn from these people. That is the secret of happiness.

Here it finally becomes clear.

First, gaining wealth, power, and fame, and then losing it.

(Laughter) Second, spend as much of your life in prison as possible.

(Laughter) Third, to make someone really, really rich.

And finally, never join the Beatles.

(laughs) Yes, that's right.

Because when people combine happiness, as these gentlemen did, we all smile at them, but in a way roll our eyes and say, "Oh yeah, you really didn't want that job."

"Oh yeah, you didn't have much in common with her, but I realized just when she threw the engagement ring in your face."

We grin because we believe that artificial happiness is not of the same quality as what we call "natural happiness."

What are these terms?

Natural happiness is what you get when you get what you want, artificial happiness is what you get when you don't get what you want.

And in our society there is a strong belief that artificial happiness is of an inferior kind.

Why do we hold such beliefs?

It's very easy.

If you believe that you can be as happy as you are if you don't get what you want, what economic engine will keep you going?

Apologies to my friend Mathieu Ricard, but a mall full of Zen monks isn't particularly lucrative. Because they don't want enough things.

(Laughter.) What I would like to suggest to you is that artificial happiness is as real and permanent as the kind of happiness you stumble upon when you get exactly what you're after.

Now, I'm a scientist, so I'm going to do this with a little bit of data, not rhetoric.

First, let us present the experimental paradigm used to demonstrate synthetic well-being among ordinary old people.

This isn't mine, it's a 50 year old paradigm called the "free choice paradigm".

It's very simple.

For example, bring in six objects and ask the subjects to rank them from most liked to least liked.

In this case, it will be Monet's print because it will be used in this experiment.

Everyone ranks these Monet prints from least liked to least liked.

Here we give you a choice: "I happen to have some extra prints in my closet.

I'll give you one as a prize to take home.

We happen to have number 3 and number 4,” we tell the subject.

This is a bit of a difficult choice as neither is strongly preferred over the other, but unsurprisingly people tend to pick number 3 because they like it slightly more than number 4.

After some time, 15 min, 15 days later, the same stimulus is placed in front of the subject and the subject is asked to re-rank the stimulus.

"Tell me how much you love me now."

what happens?

Watch the happiness synthesize.

This is the result of many iterations.

You see happiness synthesized.

do you want to see it again?

happy!

"What I received was even better than I expected!

Another one I didn't get is the worst! ”

That is the total happiness.

(Laughter) Now, what's the right reaction to that?

"Yes, that's right!"

Well, here's the experiment we did. I hope this convinces you, "Yes, that's right!" was not the correct response.

We conducted this experiment on a group of patients with anterograde amnesia.

These are inpatients.

Most of them have Korsakoff's syndrome, a polyneuritic psychosis.

They drink too much to make new memories.

They remember their childhood, but when you walk into a room, introduce yourself, leave the room, and come back, they don't know who you are.

We took the Monet prints to the hospital.

We then asked these patients to rank them from most liked to least liked.

Next, I was asked to choose between #3 and #4.

Like everyone else, they said, "Oh, thank you, Doctor! That's great! I have a new print."

I take number three. ”

We explained that we would mail number 3 to them.

We gathered our ingredients, went outside the room, and counted half an hour.

(Laughter) When I go back to my room, I say, "Hello, I'm back."

Fortunately, patients say, "Oh, doctor, I'm sorry, I have memory problems. That's why I'm here."

If I've met you before, I don't remember. ”

"Really, Jim, don't you remember? I was just here with a Monet print?"

"Sorry, Doctor, I have no clue."

"No problem, Jim.

All I want is for you to rank these from least liked to least liked. ”

what do they do?

Well, first let's see if they really have amnesia.

We ask these amnesiacs to tell us which they own, which they chose last time, and which is theirs.

And what we found is that amnesiacs are just guessing.

These are the normal controls and when I do this with you everyone will know which print you have selected.

But when you do this to amnesiacs, they have no clue.

They can't choose prints from the lineup.

Here's what a normal control does: Synthesize happiness. right?

This is the change in favorability score, i.e. the change from the first ranking to the second ranking.

Normal controls show it -- that was the magic I showed you. Now showing it in graphical form -- "What I have is better than I thought.

What I didn't own, what I left behind isn't as good as it sounds. ”

Amnesiacs do exactly the same. Consider this result.

Such people prefer things as good as they own them, but they do not know that they own them.

"Yes, that's right" is not the correct response.

What these people did when they synthesized happiness really really changed their emotional, hedonistic and aesthetic response to that poster.

They don't just say it because they own it, they don't know they own it.

When psychologists show us bars, we find that they show us the averages of many people.

Still, we all have this psychological immune system, the ability to synthesize happiness, but some of us do this trick better than others.

And in some situations, everyone can do it more effectively than in others.

Freedom, the ability to make up one's mind and change one's mind, turns out to be the natural companion of happiness. Because freedom allows you to choose among all the delicious futures and find the one you enjoy the most.

But freedom to choose, change, and decide is the enemy of synthetic happiness. I'll explain why in a moment.

"Tech support at Dogbert. How can I abuse you?"

"My printer prints a blank page every time I create a document."

"Why are you complaining about getting a free paper?"

"Is it free? Why don't you just give me your paper?"

"Look at the quality of the free paper compared to the poor quality plain paper!

Only a fool or a liar would say that two people look the same! ”

“Speaking of which, I feel like I’ve become a little smoother!”

"What are you doing?"

"I help people accept the things they can't change." That's right.

The psychological immune system works best when we are completely bogged down, trapped.

This is the difference between dating and marriage.

When you go out on a date with a man, he picks his nose. Don't go out on another date.

Are you married to a man and he picks your nose?

he has a heart of gold Don't touch the fruitcake!

You find a way to be happy with what happened.

(Laughter) Now, what I want to show you is that people don't know this about themselves, and this ignorance can work very against us.

This is an experiment done at Harvard University.

We created a black and white photography course so that students could learn how to use the darkroom.

So we gave them their cameras and walked around campus, snapping 12 photos of their favorite professor, dorm room, dog, and anything else they wanted to remember from Harvard.

They bring us cameras, do contact sheets and decide which ones are the best photos.

We now spent six hours teaching them about darkrooms and they blew up two of them.

They have two gorgeous 8x10 glossy papers with something that means to them, and we ask, "Which one would you give away?"

"Do I have to give up one thing?"

"Yes, I need it as proof of my class project.

So you have to give me one. You have to make a choice.

You keep one, I keep one. ”

Now, there are two conditions for this experiment.

In one case, the students were told, "But if you want to change your mind, I'll always have another book here for you, and before I actually mail it to Headquarters, within the next four days" -- yes, "Headquarters."

In fact, I will go to your dorm room, so please email me.

I'll check it out if possible.

If you change your mind, you can always return it. ”

The other half of the students are told exactly the opposite. "Make your choice. By the way, the mail will be sent to England within two minutes.

Your photos will fly across the Atlantic.

I will never see it again. ”

Half of the students in each of these situations are asked to predict how much they will like the photos they keep and the photos they keep.

Other students are simply put back in a small room in the dormitory and their photo satisfaction is measured over the next 3-6 days.

See what we found.

First of all, what do students think is going to happen?

They think they might like the photo they chose a little more than the one they left behind.

However, these are not statistically significant differences.

This is a very small increase and whether it was a reversible or irreversible condition is not very important.

No.

People who are stuck in that image just before the exchange and 5 days later, have no choice and can never change their minds, love this picture.

And those considering -- 'should I give it back?

Did you get the correct one?

Maybe this is not good. Maybe I left a good one? ”- committed suicide.

They don't like their pictures.

In fact, they remain dissatisfied with their photos even after the exchange opportunity has passed.

why?

This is because the ``reversible'' state does not contribute to the synthesis of happiness.

Now, this is the final part of this experiment.

We brought in a whole new group of students from Harvard and said, 'You know, we're doing a course in photography, and we can do it one of two ways.

After taking two photos, you can give them four days to change their minds. Or you could take another course where you make a decision as soon as you take two photos and you can never change it.

Which course would you like to enter? ”

66% of students, or two-thirds, prefer to attend courses where they have the opportunity to change their minds.

Hello? Sixty-six percent of students choose a course that ultimately leaves them deeply dissatisfied with the situation. (Laughter) Because they don't know the conditions under which synthetic happiness is fostered.

Of course, the bard said it all for the best, and he's making my case here, but he's exaggerating it: "Neither good nor bad, but thought makes it so."

It's a great poem, but it's not always correct.

Are there really no good or bad things?

Is gallbladder surgery really the same as a trip to Paris?

(Laughter) It's like a one-question IQ test.

They can never be exactly the same.

Adam Smith, the father of modern capitalism, said in rougher prose, but closer to the truth:

This is worth pondering. “A great deal of the misery and disorder of human life seems to stem from overestimating the difference between one permanent situation and another.

Some of these circumstances may undoubtedly deserve precedence over others, but none of them deserves to be pursued with such passionate zeal as to cause us to violate the rules of prudence and justice, or to undermine our future peace of mind by the shame of remembering our folly, and the remorse of the horrors of our injustice. ”

In other words, yes some things are better than others.

We should have priority leading us to one future, not another.

But if we overestimate these futuristic differences and let their preferences drive us too hard or too fast, we are at risk.

When our ambition is limited, it leads us to work happily.

When our ambition knows no bounds, we lie, cheat, steal, hurt others, and sacrifice what we truly value.

When our fears are limited, we become cautious, cautious, and thoughtful.

When our fears become endlessly exaggerated, we become reckless and cowardly.

The lesson I want to leave you with from these data is that both our aspirations and worries are exaggerated to some extent because we have within us the ability to manufacture the very goods we are chasing all the time when choosing experiences.

thank you.

(applause)

Welcome to Thailand.

Now, when I was a young man, 40 years ago, this country was very, very poor and very many people lived in poverty.

We decided to do something about it, but we didn't start with welfare programs or poverty reduction programs.

But we started with a family planning program following a series of very successful maternal and child health activities.

So basically, no one will accept family planning if their children can't survive.

So the first step is to contact the children, contact the mother and then follow up on family planning.

We need family planning as well as child mortality.

Now let me explain why it was necessary to do so.

It was the same in my country in 1974.

7 children per family -- a staggering 3.3% increase.

There was just no future.

It was necessary to reduce the rate of population growth.

So we said, "Let's do it."

The women said, "We agree. We use pills, but we need a doctor to prescribe them."

We did not accept a "no" answer. We accepted no as a question.

We went to the same woman, a nurse and a midwife who did a great job explaining how to use the pill.

It was great, but it only covered 20 percent of the country.

What about the remaining 80 percent? Leave them alone and say, "They are not medical personnel."

No, I decided to do some more.

So we went to the normal people you saw.

In fact, under that yellow sign was "Coca-Cola," and I wish I hadn't put it out.

At the time, we were a much bigger company than Coca-Cola.

And no difference, the people they chose are the people we chose.

They were well known in their community, they knew their customers were always right, they were great people, and they practiced family planning themselves.

So now we can supply pills and condoms to every village in the country.

So there we are. We reached out to the people we thought were causing the problem for a solution.

Wherever there are people in Thailand, you see boats with women selling things, but here you have a floating market selling bananas, crabs and even birth control pills.

So we decided that we should take an interest in religion. Because the Catholic Church is very strong in the Philippines and the Thais are Buddhists.

When we went to them, they said, "Hey, can you help me?"

I'm there, dressed in blue instead of yellow, and I have a bowl of holy water for the monks to sprinkle pills and condoms with holy water for family holiness.

And this photo was sent all over the country.

So some of the village monks were doing the same themselves.

And the women said, "No wonder there are no side effects.

You are blessed. ”

That was their perception.

Then we went to the teacher.

We all need to participate in order to provide what makes humanity a better place.

So we went to the teacher.

More than 250,000 people were taught about family planning using a new alphabet: A for birth, B for birth, C for condom, I for IUD, and V for vasectomy.

Then there was the dice rolling snake and ladder game.

If you agree with family planning, move on.

For example, "My mother takes medicine every night.

Very nice, Mom. Please proceed.

Uncle buys condoms. Very nice, uncle. Please proceed.

My uncle is drunk and doesn't use condoms. Please come back and try again. ”

(Laughter) Again, education, class entertainment.

And the kids were doing it at school too.

We had a relay race using condoms and a children's condom blowing championship.

And before long, condoms became known as a girl's best friend.

Condoms are a girl's best friend because diamonds are not available to the poor in Thailand.

When we introduced our first microcredit program in 1975, the women who initiated it said, "We only want to lend money to women who practice family planning.

If you are pregnant, please be careful of pregnancy.

If you are not pregnant, you can get a loan from us. ”

And it was run by them.

And 35 or 36 years later, it's still going.

It is part of the Village Development Bank. It's not a real bank, but a fund, or microcredit.

And it didn't need a big organization to run it - it was run by the villagers themselves.

And you will hardly see a Thai man. It's always women, women, women, women.

And we decided to help America. Because America has helped everyone whether they wanted help or not.

(Laughter.) And this is Independence Day.

We decided to vasectomy all men, but especially the American man who was at the front of the line right up to the Ambassador's residence during Van Donneur.

And the hotel provided us with a ballroom. It was a very suitable room.

(Laughter) And it was almost lunchtime, so I said, "Okay, I'll feed you lunch."

American cola, of course.

There are two brands, Coke and Pepsi.

And the food is either hamburgers or hot dogs. ”

And I thought the hot dog might be more iconic.

(laughter) And this is a young man named Willie Baum who worked for USAID.

Obviously he had a vasectomy because the hot dog was half eaten, but he was very happy.

It made a lot of news in America and pissed off some people.

I said, "Don't worry. Come on, I'll do everything for you."

(Laughter) So what happened?

All of this takes the number of children from 7 to 1.5 and the population growth rate from 3.3 to 0.5.

You could call this the Coca-Cola approach if you like, but it was the exact same thing.

I don't know if Coca-Cola followed us or we followed Coca-Cola, but we are good friends.

And that's if everyone participates.

We didn't have a strong government. We didn't have many doctors.

But it's everyone's job to be able to change attitudes and behaviors.

Then AIDS came and hit Thailand and we had to stop doing many good things to fight AIDS.

But unfortunately, the government was denial, denial, denial.

Therefore, our work was not affected.

So I thought, "If you can't go to the government, why not go to the military?"

So I went to the military and asked to borrow 300 radio stations.

They have more stuff than the government, they have more guns than the government.

So I asked them if they could help us in the fight against HIV.

And when I gave them the stats, they said, "Yes, okay. All the radio stations, all the TV stations are fine."

And that's when we hit the airwaves.

And soon after that a new Prime Minister was born.

And he said, "Mechai, would you like to join us?"

He liked my wife so much that he asked me out.

So I said, "Okay."

He became chairman of the National AIDS Commission and increased its budget by 50 times.

We have said that everyone needs to be involved in AIDS education, including all ministries, even judges, the public, institutions, religious institutions, schools, everyone.

And here, all media personnel had to be trained on HIV.

And to get more revenue, we gave every station an extra 30 minutes for advertising.

So they were happy with it.

And AIDS education in all schools starting from college.

And these are high school students teaching high school students.

And the best teachers are girls not boys and they were great.

And they were known as Mother Teresa, teaching them about safe sex and HIV.

And I took another step back.

These are elementary school students, that is, grades 3 or 4. Visiting every household in the village, every household across Thailand, providing AIDS information and condoms from these young children to every household.

And since we were trying to save lives, no parent objected and this was a lifesaver.

And we said, 'Everyone needs to be on board.'

In other words, businesses know that sick staff can't work and deceased customers won't buy.

So everyone was trained.

And the Condom Captain, who has an MBA from Harvard, goes to school and nightspots.

and they loved him. I need some symbol.

Every country, every program needs symbols. This is probably the best he's ever done with his MBA.

(Laughter.) And we handed out condoms all over the street.

Condoms are available in taxis.

Also, during traffic jams, the police will give condoms. This is our "cops and rubber" program.

(Laughter) So can you imagine a New York police officer handing out condoms?

Of course you can. And they will enjoy it greatly. Now I see them standing everywhere.

Imagine if they had condoms and were giving them out to all kinds of people.

New changes include hair bands, clothing, and condoms for mobile phones during the rainy season.

(Laughter) And this is the condom we introduced.

Some say it's a "collective protection weapon".

We found someone here looking for a weapon of mass destruction, but we found a weapon of collective protection: a condom.

And here is the American flag, with the words, "Don't leave home without this."

But there are things to pass after that.

However, these are Thai sizes, so be careful.

(Laughter) So you can see that condoms have so many benefits.

Look at this -- I gave this to Al Gore and Bill Sr.

Stop global warming; use condoms.

And here's the photo I told you about - collective protection weapons.

And may the next Olympics save some lives.

why just run around?

(Laughter) And finally, in Thailand we are Buddhists and there is no God. Instead, we say, “Trust in rubber.”

(Laughter.) So you can see that we've done everything we can to make people's lives better.

Alcohol impairs judgment, so there were condoms in every refrigerator in hotels and schools.

So what happened?

It's been a long time since everyone joined us.

The number of new HIV infections has fallen by 90 percent, according to the United Nations, and 7.7 million lives have been saved, according to the World Bank.

Otherwise there wouldn't be many Thais walking today.

So it showed that something could be done about it.

90% of the funding came from Thailand.

There was political involvement, there was financial involvement, and everyone was in the fight.

Therefore, do not leave it to specialists, doctors and nurses.

we all have to help.

And now that we've solved AIDS to some extent, we decided to work with the business community to lift people out of poverty instead of relying on the government alone.

Because poor people are business people who lack business skills and access to credit.

They should be provided by the business community.

We try to raise them to be barefoot entrepreneurs, small businessmen.

Entrepreneurship is the only way out of poverty.

So it's done.

Money from the company flows to the village through tree planting.

It's not a free gift.

They plant trees and the money goes to their microcredit fund called the Village Development Bank.

Everyone joined in and brought in money so they feel they own the bank.

And before borrowing money, you need to undergo training.

And we believe that access to credit must be a human right if we want to help the poor, those living in poverty.

Access to credit should be a human right.

Otherwise they will never get out of poverty.

And you need to get training before you can get a loan.

This is what we call a 'barefoot MBA', teaching people how to do business so they can be successful in business when they borrow money.

These are part of the business: mushrooms, crabs, vegetables, trees, fruits and this is very interesting - Nike ice cream and Nike biscuits. This is a village sponsored by Nike.

They said, 'We should stop making shoes and clothes.

Please improve more if you have time. ”

And we also have silk, Thai silk.

We now manufacture Scottish tartans for sale to all people of Scottish ancestry, as seen on the left.

Anyone sitting and watching TV, please contact me.

And this is our answer to Starbucks in Thailand - "Coffee and condoms."

Starbucks, you are awake, we wake you up and make you alive.

That's the difference.

Can you imagine being able to buy condoms at any Starbucks?

You can also order condoms with your cappuccino.

And now, finally in the area of ​​education, we want to transform underutilized schools into places of lifelong learning for everyone.

We call this school-based integrated rural development.

And it is also the center and focus of economic and social development.

Rebuild your school so it meets the needs of your community.

And here is a bamboo building. All made of bamboo.

This is a geodesic dome made of bamboo.

And Buckminster Fuller would be very proud to see a bamboo geodesic dome.

And since we use vegetables around the schoolyard, we grow our own vegetables.

And finally, I strongly believe that if the MDGs, the Millennium Development Goals, are to be successful, we need to add family planning to it.

Of course, first child mortality, then family planning, everyone needs family planning services, but they are underutilized.

Therefore, we have now discovered an arsenal of collective protection.

And we also call for life-saving efforts at the next Olympics.

And finally, it's our network.

And these are Thai tulips.

(laughs) Thank you very much.

(applause)

So today I would like to spend a few minutes with you imagining what our planet will look like in a thousand years.

But before that, we need to talk about synthetic materials like plastic. Synthetic materials require vast amounts of energy to create and are slowly polluting the planet due to disposal issues.

I also want to talk and share how my team and I have been using mushrooms for the past three years.

Not like that. (Laughter) We're using mushrooms to create a whole new kind of material. This material performs much like plastic during use, but is made from crop waste and is fully compostable at the end of its life.

(cheers) But before that, I have to talk about what I consider to be one of the worst offenders in the single-use plastic space.

This is the Styrofoam material you all know, but I think it's a poisonous white stuff.

One cubic foot of this material (as much as you'll find around your computer or large TV) contains the same energy as about 1.5 liters of gasoline.

But after just a few weeks of use, this material would be thrown in the trash.

And this is not only found in packaging.

$20 billion worth of this material is produced each year in everything from building materials to surfboards, coffee cups and tabletops.

And that's not the only place it's found.

The EPA estimates that this material makes up 25 percent of landfills in the United States.

Worse, if it encroaches on our natural environment, on the side of roads or by rivers.

If humans like me and you don't pick it up, it will stay there for thousands of years.

Perhaps even worse is when it enters the oceans, like the plastic general circulation, where these materials are mechanically shredded into smaller pieces, but do not actually disappear.

They are not biologically compatible.

They basically pollute the respiratory and circulatory systems of the earth.

And because these substances are so abundant and found in so many places, there is one more place where you can find them. It is styrene made from benzene, a known carcinogen.

you will find it in you.

For all these reasons we believe we need better materials. There are three key principles that can be used to guide these materials.

The first is raw materials.

Today, we use a single raw material, petroleum, to heat our homes, power our cars, and manufacture most of the materials around us.

We recognize that this is a finite resource. And tossing a liter and a half of gas in the trash every time you pick up a package is sheer insanity.

Second, we really need to try to drastically reduce the energy we use in creating these materials.

I said less because 10 percent isn't enough.

We should talk about half, quarter, tenth energy content.

And finally, and perhaps most importantly, you need to create materials that fit into what I call nature's recycling system.

This recycling system has been in place for the past billion years.

Both you and I will fit into it, and in 100 years my body will be able to return to Earth without pretreatment.

But that package I received in the mail yesterday will last for thousands of years.

I'm crazy

But nature offers us a really good model here.

When trees are finished with their leaves (solar heat collectors, these amazing molecular photon traps) at the end of the season, they don't pack them up and take them to a leaf reprocessing center to melt them and form new leaves.

Drop them to the forest floor over the shortest possible distance, where they are actually upcycled into next year's topsoil.

Now back to mushrooms.

Because in nature, mushrooms are a recycling system.

And what we discovered is that it resembles that root structure by using parts of mushrooms you've probably never seen before. It is called mycelium. We can actually grow materials that have many of the same properties as traditional synthetic materials.

Now, mycelium is an amazing material because it is a material that self-assembles.

In fact, what we think of as waste, such as seed husks and woody biomass, can be converted into chitinous polymers and molded into almost any shape.

We basically use it as an adhesive in our process.

And by using the mycelium as an adhesive, we can shape things just like we do in the plastics industry, creating materials with a variety of properties, such as insulation, fire resistance, moisture resistance, vapor resistance, and the ability to absorb shock and acoustic shock.

However, these substances are made from agricultural by-products rather than petroleum.

And because it's made with natural materials, it's 100% compostable in your own backyard.

So I would like to share the four basic steps required to create these materials.

The first is the selection of raw materials. If possible, choose regional, i.e. local to your area i.e. local manufactured goods.

Then you actually take this raw material, insert the tool, and physically fill it into a housing or mold of the shape you want to make.

Then you actually grow the mycelium through these particles. And here the magic happens. This is because organisms, not devices, do the work in this process.

The final step, of course, is the product, whether it's packaging, tabletops, or building blocks.

Our vision is local manufacturing as well as a local food movement in production.

So we used local by-products to create formulations for the world.

If you're in China, you might use rice husks or cottonseed husks.

If you live in Northern Europe or North America, you can use buckwheat husks, oat husks, etc.

These shells are then processed using some basic equipment.

And I would like to share a quick video from our facility that gives you a sense of what this is all about.

So what you're looking at here is actually cotton husks from Texas.

it's waste.

And what our equipment does is wash, cook, cool and pasteurize these ingredients while passing them through a continuous system that continuously inoculates them with our mycelium.

This gives us a continuous supply of material that can be machined into almost any shape, but today we are making corner blocks.

And when this lid is placed over the part, the magic really begins.

Because the manufacturing process is our organism.

It actually starts digesting these wastes and assembles them to form a biocomposite over the next five days.

Our entire facility is made up of thousands of tools and everything from building materials to, in this case, corner blocks of packaging, set in indoor darkness to self-assemble silently.

So we said many times that we grow the material.

And it's kind of hard to imagine how that would happen.

So my team condensed a typical growth cycle of 5 days worth of growth into a 15 second timelapse.

And I want you to take a closer look at these little white dots on your screen. Because over the course of five days, what these dots do is use the energy contained in these seed shells to spread outward through this material and build this matrix of chitinous polymers.

This matrix self-assembles and grows in and around the particles, creating millions of tiny fibres.

And the portion of the seed shell that we don't digest actually becomes part of the final physical composite.

So in front of you, this part is just self-assembling.

It actually takes a little longer. It takes 5 days.

But it's much faster than conventional farming.

The final step, of course, is the application.

In this case, I grew a corner block.

A leading Fortune 500 furniture manufacturer uses these corner blocks to protect their tables during shipping.

Previously we used plastic packaging buffers, but by using our grown materials we were able to give them exactly the same physical performance.

Best of all, it doesn't end up in the trash when it's in the hands of your customers.

In fact, it can be put into natural ecosystems without any processing, improving local soils.

So why the mycelium?

The first reason is local open ingredients.

With multiple options, you can do this anywhere in the world and not worry about peak rice husks or peak cottonseeds.

Next is self-organization. Because organisms actually do most of the work in this process.

You don't need a lot of equipment to set up a production facility.

This allows us to deploy a large number of smaller facilities around the world.

Biological yield is very important.

And because 100% of what you put into the tool becomes the final product, and the undigested part becomes part of the structure, you get incredible yields.

Natural polymers, well... I think that's the most important thing. Because these polymers have been tried and tested in our ecosystems for the last billion years, from mushrooms to crustaceans.

They do not clog the Earth's ecosystems. they do a great job.

And while today we can virtually guarantee that yesterday's package will still be here ten thousand years from now, I want to assure you that ten thousand years from now our descendants, our children's children, will be living happily in harmony with a healthy planet.

And I think that can be really good news.

thank you.

(applause)

Today I want to talk about prosperity and our hope for shared and lasting prosperity.

And we're not alone: ​​2 billion people around the world are still chronically undernourished.

And indeed, at the center of this is hope.

In fact, the Latin word for hope is at the heart of the word prosperity.

"Prosperus", "Speras", hope - according to our hopes and expectations.

But ironically, we have almost literally cashed in prosperity in terms of money and economic growth.

And because we overgrown our economy, we are now in real danger of ruining our hopes: resource depletion, rainforest deforestation, oil spills into the Gulf of Mexico, and climate change. And indeed, the only thing that has slightly slowed the relentless increase in carbon emissions over the past 20-30 years is the recession.

And of course, recessions don't always bring hope, as we're busy figuring it out.

So we are in some kind of trap.

It's a dilemma, a growth dilemma.

we can't stand it. we can't live without it.

Destroy the system or destroy the planet, that's a tough choice. It doesn't have much of a choice.

And the best way we can get out of this situation is actually some sort of blind belief in our own smarts, technology, efficiency, and doing things more efficiently.

Now I don't think anything about efficiency.

And sometimes we think we're a clever race.

But I think we need not only to check the numbers, but also to check the reality here.

So imagine the world in 2050. About 9 billion people want a Western income, a Western lifestyle.

And I want to ask, we believe in growth, so we give them a two percent increase in income and salary each year.

And I would like to ask, how far and how fast should it travel?

How smart do you have to be?

How much technology will the world need to meet its carbon targets?

And the left side of my graph is the current situation.

This is the carbon intensity of economic growth at the moment.

Carbon is about 770 grams.

In the world I describe to you, we need to be right here, reaching 6 grams of carbon.

That's a 130x improvement, which is 10x faster and more than anything we've ever achieved in industrial history.

Maybe it can, maybe it can – who knows.

Maybe we can go even further and create an economy that extracts carbon from the atmosphere. That is what we must do by the end of this century.

But shouldn't we first see if the economic system we have can achieve this kind of improvement remotely?

So I'd like to spend a few minutes explaining the dynamics of the system.

It's a little complicated, sorry.

What I'm trying to do is try to translate this into something like human language.

So it looks a little like this.

Businesses are households, they produce goods for us and provide us with income. And it gets even better because that income can be spent on more goods and services.

This is called the economic cycle.

It looks harmless enough.

I would like to highlight only one important feature of this system. That is the role of investment.

Although investment currently accounts for only about one-fifth of national income in most modern economies, it plays a vital role.

And what it essentially does is stimulate further consumption growth.

This is done in several ways. Drive productivity, drive down prices, and encourage people to buy more.

But I want to focus on the pursuit of newness, the role of investment in the production and consumption of newness.

Joseph Schumpeter called this the process of creative destruction.

It is a process of novelty production and reproduction in constant pursuit of expanding consumer markets, consumer goods and new consumer goods.

And here's where it gets interesting. Because it turns out that humans have an appetite for newness.

We love new things, new material things of course, but we also love new ideas, new adventures and new experiences.

But materiality is also important. Because in all the societies that anthropologists have observed, material things function as a kind of language, the language of commodities, the symbolic language we use to tell stories to each other, say, stories about how important we are.

Status-driven conspicuous consumption thrives on the word novelty.

And here, suddenly, we have a system that combines economic structure with social logic. Economic institutions and us humans are interconnected to drive the engines of growth.

And this engine is more than just economic value. It is driven by our own insatiable appetite, in fact by a sense of insecurity, which is pulling material resources relentlessly through the system.

Adam Smith spoke of our desire for a shameless life 200 years ago.

Live without shame. In his time it meant a linen shirt. And now, I still need a shirt, but a hybrid car, an HDTV, two holidays a year in the sun, a netbook and an iPad, the list goes on. This anxiety drives us to supply an almost inexhaustible supply of commodities.

Even if you don't want it, you should buy it. Because the system will crash if you don't buy it.

And to stop that crash over the last 20-30 years, we've expanded the money supply, expanded credit and debt so people can keep buying things.

And, of course, that expansion was deeply related to the crisis.

But this -- I just want to show you some data here.

This is essentially what this credit and debt system looks like in the UK only.

This was the last 15 years before the crash, and we can see that consumer debt increased dramatically.

Just before the crisis, it had exceeded GDP for three years in a row.

And in the meantime, private savings have shrunk completely.

The savings rate, or net savings, was below zero in mid-2008, just before the crash.

This is people adding to their debt and depleting their savings just to stay in the game.

Quite simply, this is a strange and rather perverted story.

This is the story of how we humans are persuaded to spend money we don't have on things we don't need to make a lasting impression on people we aren't interested in.

(Laughter) (Applause) But before you give yourself up to despair, maybe you should step back and say,

Is this really what humans are like?

Is this really what the economy is doing? ”

And almost immediately you actually run into some anomalies.

The first is the crisis itself.

What do people want to do in a crisis or recession?

They want to sit back and look to the future.

They want to spend less and save more money.

But from a system point of view, saving is just the wrong thing to do.

Keynes called this the "thrift paradox", saving slows recovery.

And politicians are constantly asking us to pay off more debt and take down more of our savings so that we can keep the show on track and continue this growth-based economy.

It's an anomaly, where the system really contradicts us as humans.

Let me introduce you to something completely different. Why don't we do the blindingly obvious things we need to do to combat climate change: the very, very simple things like buying energy-efficient appliances, turning on efficient lighting, turning off the lights from time to time, and insulating our homes?

These save carbon, save energy, save money.

So even though they are perfectly economically rational, are we not doing them?

Well, I had a personal insight into this several years ago.

It was Sunday evening, Sunday afternoon. It was right after we moved into our new house. To be honest, it's been a long time.

Finally, we set about removing drafts and installing insulation around windows and doors to prevent drafts.

My daughter, who was 5 years old at the time, helped me as much as any 5-year-old child would.

After doing so for a while, she turned to me with a very solemn look and said, "Does this really keep giraffes away?"

(Laughter) "Look, it's a giraffe."

You can hear the brain of a 5-year-old at work.

Interestingly, these locations are 400 miles north of here in the suburb of Barrow-in-Furness, Cumbria.

Most people are familiar with what the weather is like in the Lake District.

But in reality it was that childish misrepresentation that stuck with me. Because it suddenly became clear why we don't do the blindingly obvious things.

We are busy preventing giraffe invasion. We get the kids on the bus in the morning, get to work on time, endure a flood of emails and field politics, shop for groceries, eat together, spend precious hours in the evening escaping to primetime TV or TED Online, and travel end-to-end to keep giraffes out.

(Laughter) What is your purpose?

"What is the purpose of the consumer?"

Mary Douglas asked in her essay on poverty 35 years ago:

"It's about creating a social world and helping people find a trusted place in it," she said.

It is a very human vision of our lives, quite different from the one at the heart of this economic model.

So who are we?

who are these people?

Are we new-seeking, hedonistic and selfish people?

Or can we really be like the selfless altruists depicted in Rembrandt's lovely sketches?

In fact, psychology tells us that there is a tension, a tension between behavior about self and behavior about others.

And because these tensions have deep evolutionary roots, selfish behavior adapts to specific situations: fight or flight.

But other behaviors are also essential for our evolution as social beings.

And perhaps even more interesting from our point of view is another tension between novelty-seeking behavior and tradition and preservation.

Novelty is adaptive and needs to adapt itself when things are changing.

Tradition is essential in building the stability to feed a family and form a cohesive social group.

Now suddenly you are looking at a map of the human mind.

And it suddenly reveals to us the heart of the matter.

What we have done is that we have created an economy.

We have created a system that systematically privileges and encourages one narrow quadrant of the human soul while ignoring others.

And likewise, since this is not about changing human nature, the solution will also become apparent.

In fact, it doesn't narrow the possibilities.

It's about opening up.

It is to give oneself the freedom to be fully human, to recognize the depth and breadth of the human spirit, and to build institutions to protect the fragile altruist inside Rembrandt.

What does this mean for economics?

What would an economy look like if we took our vision of human nature at its center and extended it along the orthogonal dimensions of the human psyche?

Well, this might be a bit like the 4,000 regional profit companies that have sprung up in the UK over the past five years and a similar rise in US B corporations. A B company is one whose focus is on enshrining its environmental and social goals in its constitution. In fact, this company, a company like Ecosia.

I would like to show you this.

Ecosia is an internet search engine.

Internet search engines work by monetizing the sponsored links that appear when you search.

Ecosia works in much the same way.

So you can do it here. Just enter a few search terms.

Look, Oxford, that's where we are. Let's see what happens.

However, unlike Ecosia, Ecosia earns income in the same way, but allocates 80% of that income to Amazon rainforest conservation projects.

And I'm going to do it.

Just click on Naturejobs.uk.

If anyone is looking for a job during the recession, visit this page.

So what happened is that the sponsor donates the proceeds to Ecosia, who donates 80% of the proceeds to a rainforest conservation project.

They are taking profits from one source and using them to conserve ecological resources.

This is a different kind of business for the new economy.

If you like it, this is a form of ecological altruism, perhaps close to it. Maybe it is.

Whatever it is, whatever this new economy is, what we need the economy to do is really bring investment back to the center of the model and rethink investment.

Investment will cease to be a relentless and ill-advised pursuit of consumption growth.

Investing should be a different creature.

Investments in the new economy must protect and nurture the environmental assets on which our future depends.

It has to be about migration.

We need to invest in low-carbon technologies and infrastructure.

In fact, we must invest in the idea of ​​meaningful prosperity, giving people the ability to thrive.

And, of course, this task has a serious side.

It is nonsense to say that people will prosper without food, clothing and shelter.

But it is also clear that prosperity goes beyond this.

It has social and psychological purposes such as family, friendship, engagement, society and participation in the life of that society.

And this too requires investment, investment – ​​places where we can connect, places where we can participate, common spaces, concert halls, gardens, parks, libraries, museums, centers of tranquility, places of joy and celebration, places of quiet and contemplation, places for, in Michael Sandel’s lovely words, “fostering common citizenship.”

Investment, after all, is just a basic economic concept, but nothing more than the relationship between the present and the future, the shared present and the common future.

And we need that relationship to reflect and restore hope.

Now, with this hope, let's return to the two billion people still trying to live each day for less than the price of a skinny latte at the cafe next door.

What can we offer them?

It is clear that we have a responsibility to lift them out of poverty.

Clearly, we have a responsibility to ensure room for growth in the poorest countries where it really matters.

And it is also clear that we will never achieve that unless we can redefine the sense of meaningful prosperity in richer countries—one that is more meaningful and less materialistic than growth-based models.

So this is not just a Western post-materialist fantasy.

In fact, when Prosperity Without Growth was published, an African philosopher wrote to me, pointing out the parallels between this view of prosperity and the traditional African concept of Ubuntu.

Ubuntu says "I am because we are".

Prosperity is a joint effort.

Its roots are long and deep. The basis that I have tried to show already exists within each of us.

So this is not meant to block development.

It's not about overthrowing capitalism.

It's not about trying to change human nature.

What we're doing here is taking a few simple steps towards fit-for-purpose economics.

And at the heart of that economics is a more credible, more robust, more realistic vision of what it means to be human.

thank you very much.

(Applause) Chris Anderson: While they're taking the podium, it's a simple question.

First of all, economists shouldn't be inspirational, so you may need to adjust your tone a bit.

(Laughter) Can you imagine how politicians would agree with this?

I mean, can you imagine a politician in the UK standing up and saying, "GDP is down 2% this year, good news!"

In fact, we are all happier, our country is more beautiful, and our lives are better. ”

Tim Jackson: Well, that's obviously not what you're doing.

We don't make the news that things have fallen.

Making news that tells us we are thriving.

Can you imagine politicians doing that?

Actually, I'm already starting to see it little by little.

When we first started doing this kind of work, politicians and Treasury spokesmen used to stand up and accuse us of wanting to go back and live in caves.

And indeed, during the period we've been working on over the last 18 years, with the financial crisis and the economists becoming a little humbled, people are actually wrestling with this problem in all sorts of countries around the world.

CA: But is it primarily politicians that have to act, or is it more just civil society and business?

TJ: It has to be corporate. It has to be civil society.

But it requires political leadership.

This is kind of an agenda, and in fact politicians themselves are so obsessed with the growth model that they are in a kind of dilemma.

But in practice, it is absolutely essential to open up space for thinking about different ways of governing and different kinds of politics, and for civil society and business to operate differently.

CA: So if someone could convince you that we could actually make it, what was it? -- A 130x increase in efficiency and a lower carbon footprint, but do you really want the image of economic growth moving toward more knowledge-based products?

TJ: In terms of removing carbon from the atmosphere, solving biodiversity issues, reducing land use impacts, and doing something about topsoil erosion and water quality, I'm still curious to see if we can do that and get it below zero by the end of the century.

If you're confident that we can do it all, yes, I'll take the 2 percent.

CA: Tim, thank you for a very important talk. thank you.

(applause)

I have had a lifelong fascination with the beauty, form and function of giant bluefin tuna.

Bluefin tuna are warm-blooded animals just like us.

They are the largest of the tuna and the second largest fish in the sea - bony fish.

In fact, they are endothermic fish, and like mammals, they move powerfully through the ocean with warm muscles.

This is one of the bluefin tuna in the Monterey Bay Aquarium.

Its shape and streamlined design give it the power to swim in the ocean.

They use their pectoral fins to fly in the sea, and their moon-shaped tails provide lift to enhance their movement.

In fact, most parts of their bodies have bare skin, which reduces friction with water.

This is one of nature's greatest machines.

Well, bluefin tuna has been revered by mankind throughout human history.

For 4,000 years, we have fished sustainably for this animal. It is evidenced by works of art dating back thousands of years.

French cave paintings depict bluefin tuna.

It is depicted on a 3,000-year-old coin.

This fish was worshiped by mankind.

It has been sustainably fished all along, except for our generation.

Bluefins will follow you wherever you go. There is a gold rush on Earth, and this is a gold rush for Bluefins.

Until recently, there were traps that fished sustainably.

Nonetheless, today's high-stakes cage fishing is ecologically wiping bluefin tuna from the face of the planet.

Today, bluefin tuna generally live in one location, Japan.

Some of you may be guilty of contributing to the demise of the Bluefins.

It's a delicious muscle with plenty of fat, and it's really delicious.

And that is their problem. We eat them to death.

Well, in the Atlantic, the story is very simple.

Bluefin tuna have two populations, one large and one small.

North America has a catch of about 2,000 tons.

European populations and North African Eastern bluefin tuna have been caught at a staggering 50,000 tonnes almost every year for the past decade.

As a result, both western and eastern chromuffin populations have declined significantly in both regions, with a 90 percent drop back to the 1950 baseline.

As such, bluefin tuna are given equal standing with tigers, lions, certain African elephants, and pandas.

These fish have been proposed for inclusion on the endangered species list in the last two months.

The vote and rejection took place just two weeks ago, despite the excellent science shown by two committees that the fish meets CITES I criteria.

And if that's someone who's not into tuna, perhaps you're interested in the fact that international longlines and tracking go after tuna, with bycatch of animals such as leatherback turtles, sharks, marlin and albatrosses.

These animals and their deaths occur in tuna fisheries.

The challenge we face is that we know so little about tuna, and everyone out there knows how African lions kill their prey.

No one has ever seen a giant bluefin tuna feeding.

This tuna symbolizes what matters to all of us in this room.

We are in the 21st century and we are just beginning to really dig deep into the ocean.

Advances in technology have made it possible to observe the Earth from space and go to the deep sea from remote locations.

And we need to use these technologies soon to better understand how the ocean realm works.

Most of us, myself included, look at the sea from a ship and see this homogeneous sea.

I don't know where the structure is.

Like the plains of Africa, you never know where to find a drinking fountain.

I can't see the corridor, and I don't know what the tuna, the leatherback turtle, and the albatross are all in one.

We are just beginning to understand how physical and biological oceanography work together to create seasonal forces that actually trigger upwellings that can make hotspots a desired place.

What makes these challenges great is that going to sea is technically difficult.

Bluefin tuna are difficult to study throughout the Pacific territory.

It's really hard trying to get up close and tag a Mako shark.

And imagine being OSU's Bruce Mate's team getting up close to a blue whale and tagging the remaining blue whales. This is an engineering challenge that we haven't really overcome yet.

So the story of our team, a dedicated team, is fish and chips.

We basically use the same parts that are used in satellite phones and computer chips.

We combine them in an unusual way and this takes us to the realm of the sea like never before.

And for the first time, using light and photons to measure sunrise and sunset, we can now see tuna's journey beneath the ocean.

I have been working with tuna for over 15 years now.

I am privileged to be a partner of the Monterey Bay Aquarium.

We actually cut out a piece of the ocean and put it behind glass to display the bluefin and yellowfin tuna together.

When the veil of foam lifts each morning, you can actually see the pelagic community. This is one of the few places on earth where you can see giant bluefin tuna swimming.

We can see their constant activity in the beauty of form and function.

They fly in their own space, ocean space.

And we can reach 2 million people a year to touch this fish and share its beauty.

Behind the scenes is a Stanford University lab affiliated with the Monterey Bay Aquarium.

We've actually had both bluefin and yellowfin tuna in captivity here for over 14 or 15 years.

We were studying these fish, but first we had to learn how to keep them.

what do they like to eat

what are they happy with?

We enter the tank with the tuna and touch their bare skin. It's so amazing. I feel great.

And even better, we have our very own tuna whisperers, Chuck Farwell and Alex Norton, who can get big tuna into the water with one move, so we can really learn techniques to handle tuna and not hurt this fish that never sees boundaries in the open sea.

Jeff and Jason there are scientists trying to get the tuna out and put it in the equivalent of a treadmill or waterway.

And even though the tuna thinks it's going to Japan, it stays there.

We are actually measuring its oxygen consumption and energy consumption.

We take this data to build better models.

And looking at that tuna, this is my favorite view. I start wondering. How did this fish solve the longitude problem before we did?

So look at that animal.

It's probably the closest you'll ever get.

Well, lab activity taught us how to go out to sea.

So, in a program called Tag-A-Giant, I actually went from Ireland to Canada and from Corsica to Spain.

We've been working with many countries around the world to fish in what is basically an effort to put an electronic computer inside a giant tuna.

We have actually tagged 1,100 tuna.

I've tagged 1,100 tuna, so I'm going to show you three clips.

It's a very difficult process, but that's ballet.

Take out the tuna and measure it.

A team of fishermen, captains, scientists and engineers work together to keep the animals out of the ocean for about 4-5 minutes.

Oxygen is given by pouring water on the gills.

Then, after a lot of work, we tag it, put a computer in it, make sure it has stems sticking out so it can sense its surroundings, and then send it back to the ocean.

And when it works we are always happy.

You can see the movement of the tail.

And from the data collected, when that tag came back, fishermen returned it with a $1,000 reward, so we can now get up to five years of vertebrate footprints on the ocean floor.

In some cases, tuna can get quite large, like this fish off Nantucket.

But this is about half the size of the largest tuna we've ever tagged.

It takes human effort and team effort to pull up the fish.

In this case, what we are trying to do is tag the tuna with a popup satellite archive tag.

The tag rides on the tuna, senses the tuna's surroundings, physically detaches from the fish, floats on the surface, and transmits mathematically deduced position, pressure and temperature data on the tag back to the Earth orbiting satellite.

And what you get from pop-up satellite tags is the freedom from requiring human intervention to reacquire the tags.

Both of the electronic tags I'm talking about are expensive.

These tags were developed by various teams in North America.

These are some of our best equipment and our newest technology in the ocean today.

In general, one community has provided us with more support than any other.

That's the fishing industry off the coast of North Carolina.

Two villages, Harris Village and Morehead City, have held an annual winter party called Tag a Giant for over a decade, where fishermen work together to tag 800 to 900 fish.

This time I will actually measure the fish.

We are going to do what we started doing in recent years, taking mucus samples.

Observe how glowing your skin is. I can see my face there.

And then you get the genetic profile from that mucus, you get the information about the gender, you check the pop-up tags again, and it spills out into the ocean.

And this is my favourite.

With the help of my former postdoc Gareth Lawson, this is a great photo of a single tuna.

This tuna is actually moving over the numerical ocean.

The warmer is the Gulf Stream, the cooler is the Gulf of Maine.

The tuna wants to go there -- it wants to feed on the herring -- but it can't get there. too cold

But then it warms up and the tuna come and catch the fish, probably back home and re-enter, then back in the North Carolina winter, then back to the Bahamas.

And my favorite scene is three tuna entering the Gulf of Mexico.

Three tuna are tagged.

Astronomical calculation of position.

they are gathering. It could be tuna sex and there it is.

This is where tuna spawn.

From such data, we were able to create a map. This map shows thousands of locations generated by tagging over the last decade and a half.

And now it shows that tuna in the west go east.

So there are two populations of tuna, the Gulf population, one of which can be tagged. Tuna goes to the Gulf of Mexico. The other one, which I showed you earlier, is the second population.

Living among our tuna, the North American tuna, is the European tuna that goes back to the Mediterranean Sea.

Hotspots, or hopespots, have mixed populations.

So what we've done with science is that we're building a new model for an international committee to show that the no-mix model (which has been used to this day to reject CITES) is not the correct model.

This model is an overlapping model and a way forward.

Therefore, it is possible to predict where the administrative location should be.

Places like the Gulf of Mexico and the Mediterranean Sea are places where single species, single populations can be caught.

These frankly show up where we need to protect.

In the heart of the Atlantic where mixing takes place, Canada and the United States are doing a good job of managing their fisheries well, so you can imagine a policy allowing Canada and the United States to fish.

But in a global community where fishing and overfishing are really rampant, we must create a place of hope in these places.

This size is necessary to protect bluefin tuna.

Now, in our second project, called Pacific Ocean Tagging, we tackled Earth as a team participating in the Census of Marine Life.

Funding, mostly through the Sloan Foundation and others, allowed us to actually participate in the project. We are one of 17 field programs that have started working on tagging not only tuna, but many predators.

So what we did was we actually went tagging salmon sharks in Alaska, met salmon sharks at their home base, followed them inside where they were catching salmon, and discovered that if you catch a salmon and tie it to a string, you can actually catch a salmon shark. This is the great white shark's cousin. Be very careful, be careful, we say "very carefully", but you can actually calm a salmon shark, put a hose in its mouth, keep it off the deck, and tag it with a satellite tag.

That satellite tag homes your shark phone and sends the message.

And the jumping shark there has antennas if you look closely.

It's a free-swimming shark with a satellite tag that chases down salmon and sends the data home.

Salmon sharks aren't the only sharks we tag.

But salmon sharks with this meter-level resolution live in oceans of extreme temperature. Warm colors are warmer.

Salmon sharks descend to the tropics and come to Monterey to give birth.

Right next door to Monterey, on top of Farala Lawns, is now a great white shark team led by Scott Anderson (there) and Sal Jorgensen.

They can throw a target - it's a seal-shaped carpet - and then come the great white sharks, curious creatures that come right up to us at our 16 feet. boat.

It's an animal weighing thousands of pounds.

And I'm going to involve the target.

Then acoustically place an acoustic tag such as "OMSHARK 10165" using ping.

It will then be fitted with satellite tags that enable long-distance travel using light-based geolocation algorithms resolved on computers on board the fish.

In this case, when the monkey looks at the two tags there, it sees the tag that a great white shark in California goes to a great white shark cafe and comes back.

We also tag the mako shark with our NOAA colleague, the blue shark.

And now we can see this sea of ​​color, what we can see in temperature, 10-day worms in mako sharks and salmon sharks.

There are great white sharks and blue sharks.

Ecoscapes as large as the ocean scale that show where sharks go.

TOPP's tuna team has done the unthinkable. Three teams simultaneously tagged 1,700 bluefin, yellowfin and albacore tuna. We carefully rehearsed a tagging program where we would go out and pick up a juvenile tuna, attach a tag with a physical sensor, stick the tuna out and release it.

They are returned, and when they are returned, here in NASA's Numerical Ocean, we see blue-clad bluefin tuna crossing the corridor and back to the Western Pacific.

Our team at UCSC affixed tags to the heads of elephant seals that would come off when they molted.

These elephant seals cover half the ocean and capture data down to 1,800 feet. This is amazing data.

Then Scott Shaffer and Petrel will tug, light-based, and tug a never-before-seen 35,000 nautical mile trip from New Zealand to Monterey and back.

But now, with tiny light-based geolocation tags, we can actually see these journeys.

The Laysan albatross does the same, traveling across the ocean and sometimes into the same zones utilized by tuna.

I can see why they get caught.

And from Playa Grande, George Schillinger and the leatherback turtle team tag along as leatherback turtles pass in front of us.

and Scott Benson's team showing that leatherback turtles migrate from Indonesia to Monterey.

So what we can see in this moving ocean is that we can finally know where our predators are.

You can see how they are actually using an eco-space as large as the ocean.

And based on this information, you can start to map the desired spots.

So we have only 3 years of data here, but we have 10 years of this data.

We observe the heartbeat and seasonal activity these animals are doing.

So what we can do with this information is boil down to hotspots, 4,000 deployments, a huge challenge, 2,000 tags in a supposed gathering point area off the coast of California shown here for the first time.

And it's like an encore from the animals, they help us out.

They actually carry equipment that acquires data up to 2,000 meters.

They are extracting information from Earth in very important places such as Antarctica and Poland.

These are seals released from many countries, sampling beneath the ice sheets and providing us with temperature data on ocean quality at both poles.

Visualizing this data is very interesting.

I still don't know the best way to visualize the data.

And while these animals swim and provide us with important information for climate issues, we believe it is important to make this information available to the public and engage the public in this kind of data.

We did this at the Great Turtle Race. Tagged turtles brought in 4 million hits.

And now, with Google's Oceans, you can actually put a great white shark in that ocean.

And as we swim, we see this spectacular deep-water terrain that sharks know to be on their way from California to Hawaii.

But maybe Mission Blue can fill that ocean that we can't see.

We have the capabilities, NASA has the oceans.

All you have to do is assemble it.

In conclusion, we now know where Yellowstone is in North America. It's off our coast.

We have the technology to show where it is.

Perhaps one thing to think about with Mission Blue is increasing its biologging capabilities.

How can this kind of activity actually take place elsewhere?

And finally, we might use live links from animals such as blue whales and great white sharks to basically get the message home.

Build a killer app if you can.

Many were thrilled that a shark actually passed under the Golden Gate Bridge.

Connect the public directly to this activity on their iPhone.

By doing so, you can dispel some myths on the internet.

That's how we can save bluefin tuna.

We can save great white sharks.

We have science and technology.

Hope is here. Yes, I can.

All we need is to apply this ability further to the ocean.

thank you.

(applause)

We are here today because the United Nations sets goals for national progress.

They are called the Millennium Development Goals.

The reason I really like these goals is because there are eight goals.

And by designating eight different goals, the United Nations said there is much the country needs to change in order for its people to have a prosperous life.

look here We must end poverty, education, gender, child and maternal health, curb infectious diseases, protect the environment, and build good global links between nations on everything from aid to trade.

A second reason I like these development goals is that each goal is evaluated.

Consider childhood mortality. The goal here is to reduce child mortality by two-thirds between 1990 and 2015.

This equates to a 4% annual reduction when measured.

That's what makes the difference between having this kind of political talk and really addressing what matters is a better life for people.

And what makes me very happy about this is that many countries in Asia, the Middle East, Latin America and Eastern Europe have already documented that they are declining at this rate.

And even mighty Brazil is declining at 5% a year and Turkey at 7% a year.

Well, there's good news.

But then I hear people say, 'There is no progress in Africa.'

And we don't even have statistics to know what's going on about Africa. ”

Prove them wrong on both counts.

Join us in the wonderful world of statistics.

I will refer you to a web page called ChildMortality.org. Here you can find deaths for children under 5 in all countries. The research is being conducted by United Nations experts.

Take Kenya for example.

The data will be displayed here.

Don't panic. Don't panic now. I will help you.

It makes me feel bad, like when I was in college when I hated statistics.

But first, when you see a dot like this, you should ask yourself. where did the data come from?

What is the origin of your data?

Does it mean that in Kenya, when a child dies, a doctor or other professional prepares a death certificate, which is sent to the Statistics Office?

No, low-income countries like Kenya don't have that level of organization yet.

It exists, but it is not complete because so many deaths occur within families with families and are not registered.

We are not dependent on an imperfect system.

There are interviews and questionnaires.