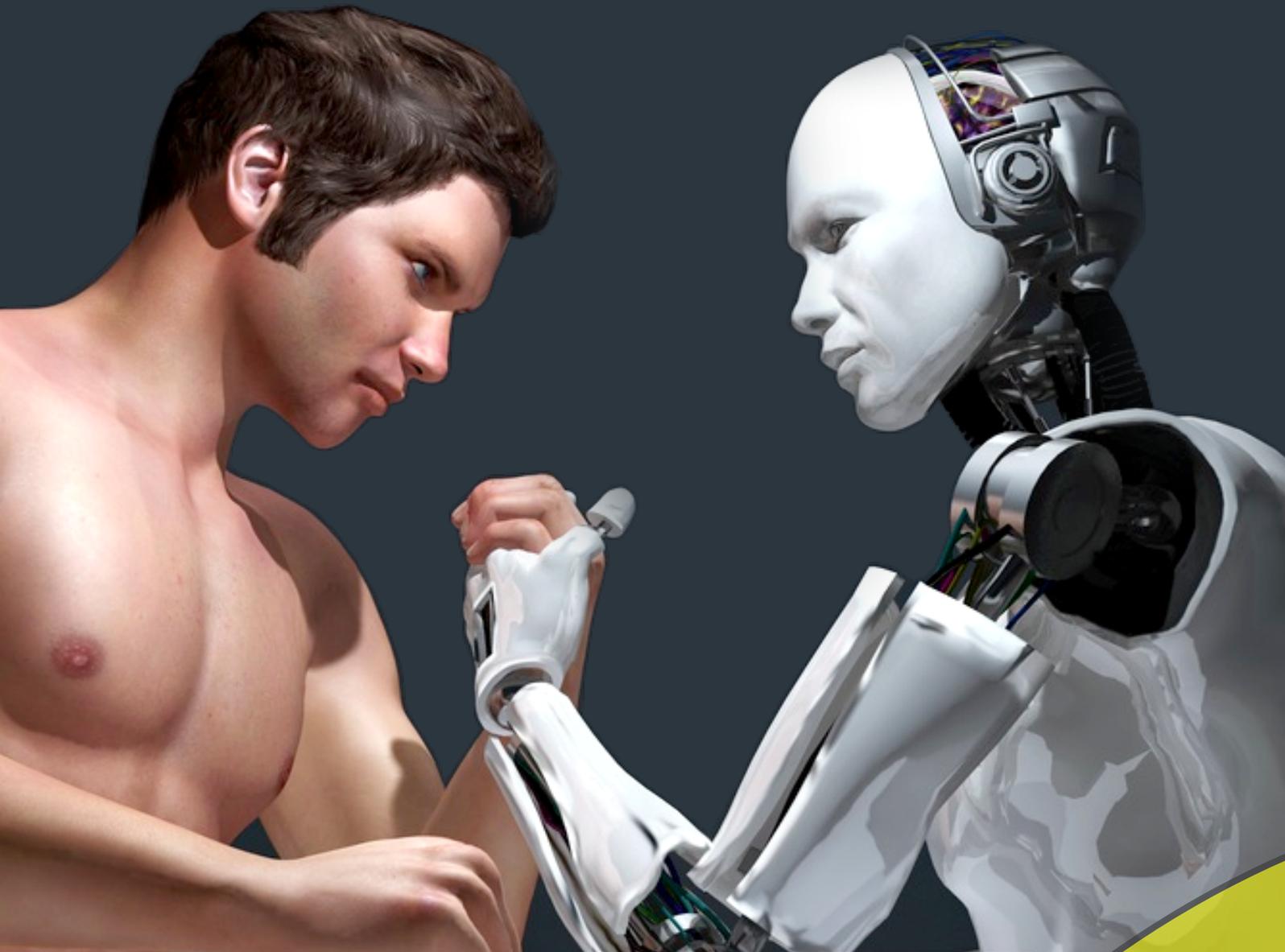


TVP

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- EARTH: EVENTS
- PLANETS POVERTY
- THE CRUISE-LINER CITY

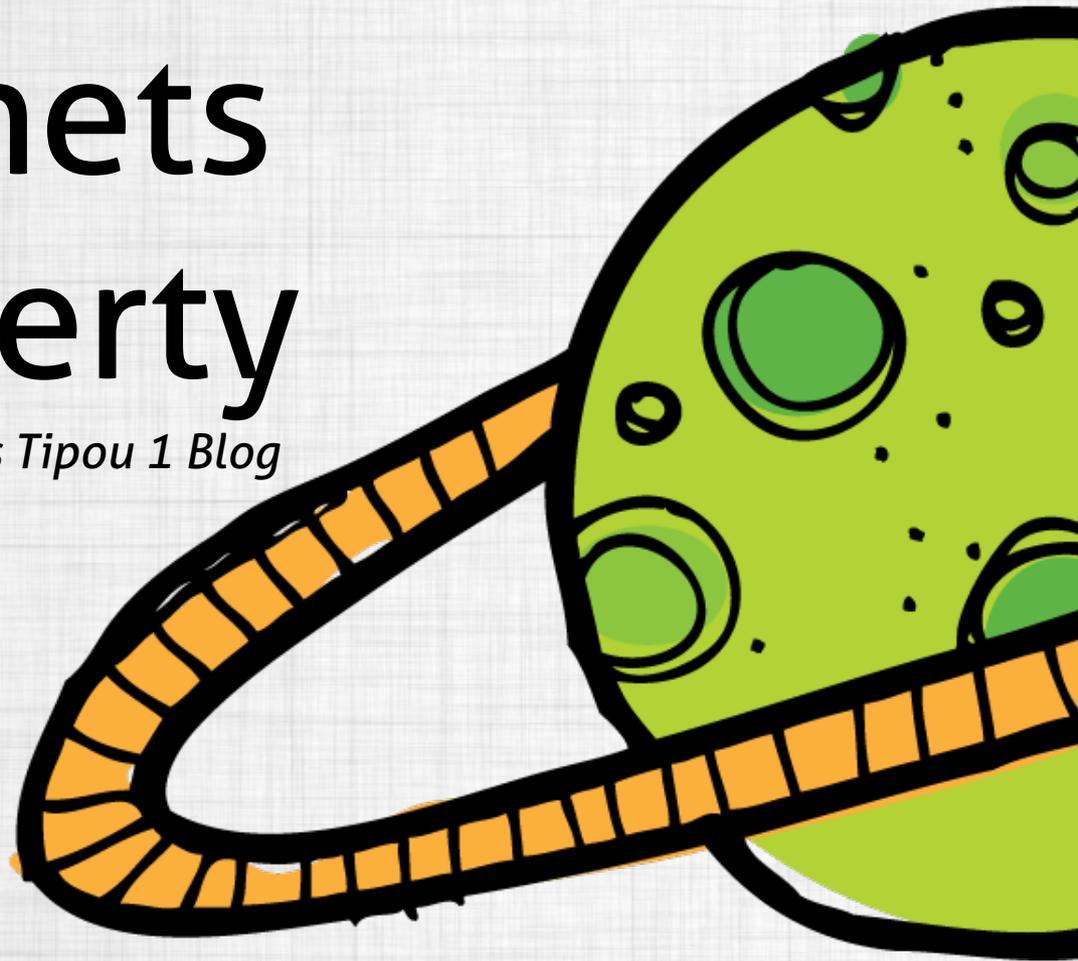
HUMAN VS MACHINE



no. 17

Planets Poverty

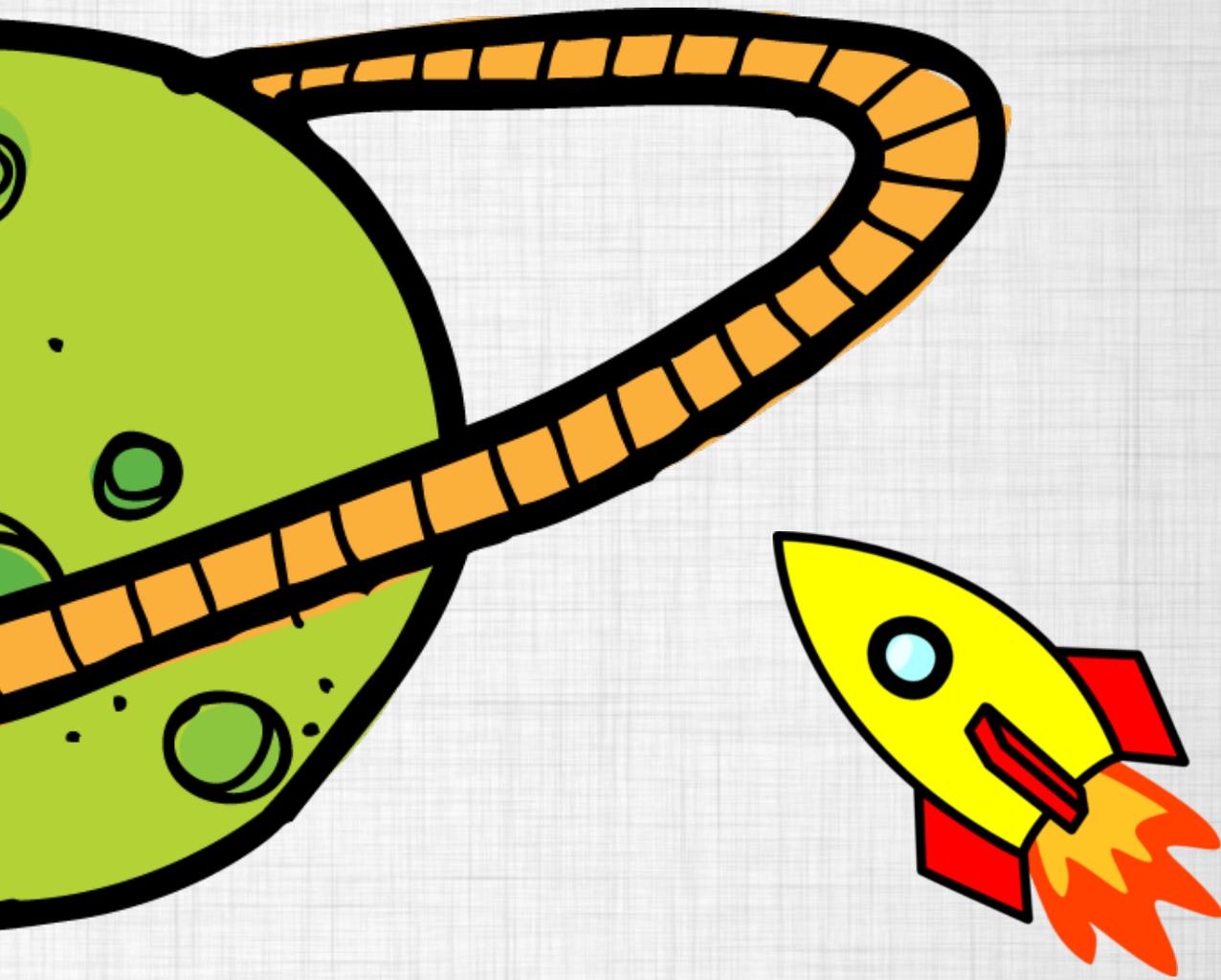
by Politismos Tipou 1 Blog



How many more planets would we need to eradicate poverty?

Let's suppose that a few thousand years from now, we have the proper technology to send some humans to an uninhabited planet far away that can accommodate human life.

How might we choose to manage this planet? Wouldn't we investigate everything, such as where could we build houses, and where are the best places to grow everything necessary for our food? Wouldn't we strive to allow every human on this new planet to live fully, without unfulfilled needs? Wouldn't we do all of the research needed to learn and respect the rate at which the consumption of goods and the planet's resources would allow us to remain in harmony with its natural environment? Would we contaminate uncontrollably? I don't think so.



If we have technology that allows us to travel that far away from Earth, then certainly we would clearly understand that if we want to have a "home" that is in harmony with us, we must first know this "home" inch by inch, and take good care of it so that this new environment remains sustainably suitable for us.

This quest for a new home planet might be crucial by that time if, due to uncontrollable exploitation and pollution of its environment, Earth is no longer able to sustain life.

As a result, all the above lead to the obvious conclusion that we should not treat this new planet in the same way that we treat the Earth today.



Let's talk about another scenario:

Let's suppose that a few years from now, as if by "magic", 2 exact duplicates of Earth are found suddenly orbiting the Sun, as close to us as the moon. As a result, it would be relatively simple for us to colonize and exploit them. Of course, such close proximity of two new planets would normally affect Earth in many negative ways, but let's assume that none of that happens with this magical appearance, leaving science and physics out of this scenario.

So, we realise that humanity suddenly has an opportunity to "own" triple the wealth: plenty of oil, food, resources and "space" for all! How would we choose to utilize the wealth of these two additional planets? Considering this fantasy scenario along with the current data of how the 'original' Earth's monetary system and global society work, it would very likely bring chaos to humanity. Every country would want its own piece of land, business interests would make investments to "suck" these planets' resources in order to sell them; we might even drive ourselves into a third world war in order to find out which nations will profit most from these spare planets' resources.



Of course, few would want to discuss the fact that the planets' resources would set an end to the "lack of resources" argument that is espoused by the current financial system in order to continue to perpetuate itself. Most would rush to make new investments of billions of dollars, trying to earn much more money than they already do now. None of them are likely to say: "Okay, humanity now has the goods of 2 more planets in its hands. Let's abolish money and everyone will live without want from now and on, because there is no longer such a thing as a lack of resources".

That scenario should really make us wonder about whether the relatively small group that currently holds the reins in political and economic terms truly wants to eradicate the poverty and scarcity issues that lead to so many current inequalities.

Even if humanity could "exploit" a thousand planets like Earth, the current system would still want people to work, to want and strive for the goods that they sell, or to be killed in useless wars in order for them to earn more and more money and power.

And this is because they do not yet recognize any other alternatives of managing societies, and they do not yet understand that in a Venus Project resource-based society, where technology and science is applied to human concern, they would live far, far better than the richest people today, along with all of the people of Earth, as there are enough resources on this one 'original' planet to easily achieve such an advanced, truly civilized society.

So, the appearance of these two 'spare' planets could offer something very positive to humanity, only if we lived in a different social system than we do now; a resource-based social system that had declared all of Earth's resources as the common heritage of all the world's people.





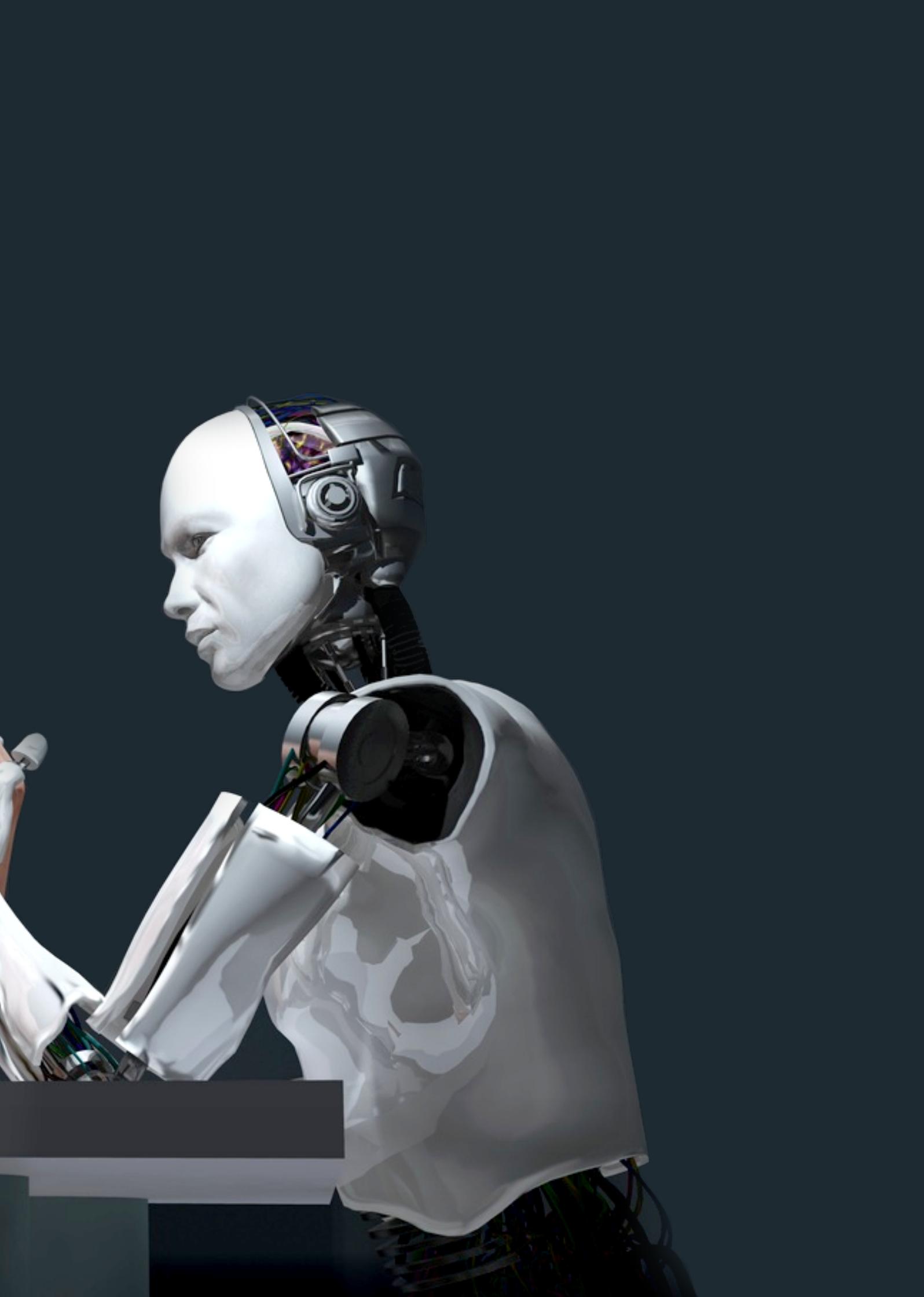
These two scenarios don't have to become reality for us to confront the many questions that need to be raised about the way we live. There is no need to wait thousands of years in order to work through all of this in our minds, as in the first scenario, or to have something 'magical' happen, as in the second.

All it takes is for all of us to seriously think about them now, and create, as soon as possible, the foundations to apply these most necessary changes to the one and only planet we have today, Earth.

HUMAN VS MACHINE

BY TIO





Human beings are extraordinary creatures. Just think of the machines they built, the discoveries they made, and the continual, steady progress of this thing they call 'science'.

They can look back billions of years into the abyss of the universe through telescopes and mathematical formulas, manipulate atoms and even enhance their biology. However, the human being, the individual, is extremely obsolete without the tools he invented. And when I say obsolete, we're talking in terms of the kinds of jobs that are required in today's monetary system.

From their arms and legs to their brains and varied skills, it seems obvious that humans have become surpassed by machines that can do far better jobs, even without any human control/involvement.



So, what if we take all of the top tools the human invented and compare them to the bare-naked human creature? From their vision to dexterity; from memory to creativity, would humans stand any chance against their machines?



◆ HEARING AND SNIFFING

If you currently rely on humans, with their little ears and tiny noses, to be detectors of any sort of sounds and odors, then you would be better off hiring a cow, as it hears and detect odors better than any human can.

Actually this is the same reason why dogs are often used to detect odors (dangerous chemicals, drugs, gunpowder, etc.) and not humans. But even well-trained dogs are being systematically replaced with robots that are continually getting better at 'sniffing' a variety of 'smells'.

Gasbot is one such robot, used for detecting and mapping bio-gas emissions at landfill sites.



REMOTE METHAN SENSING

LASER SCANING

PANTILT UNIT

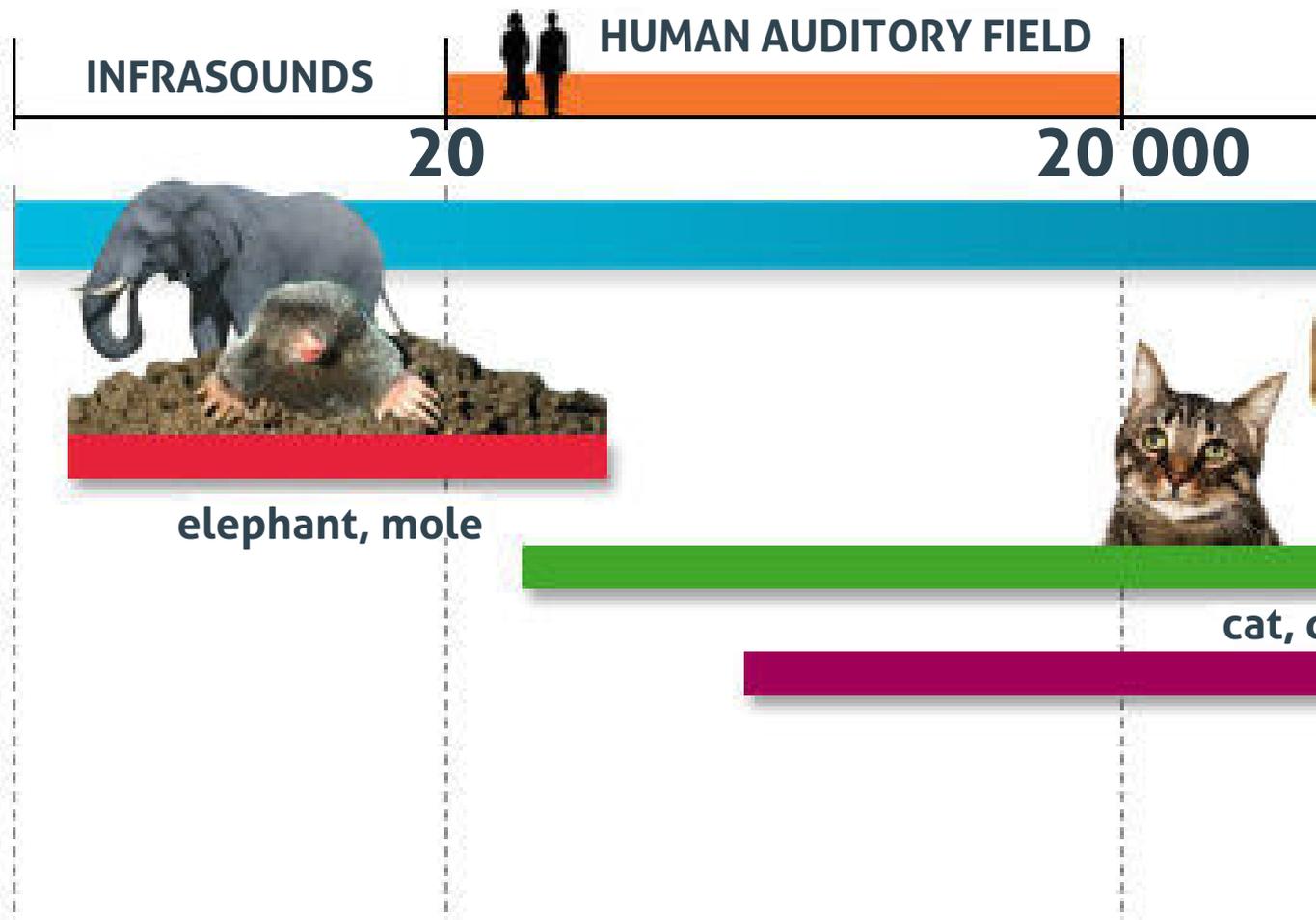
It can:

- Localize itself and navigate in semi-structured environments, both indoor and outdoor
- Produce models of the gas distribution
- Detect and localize gas sources

INDOOR LOCALIZATION

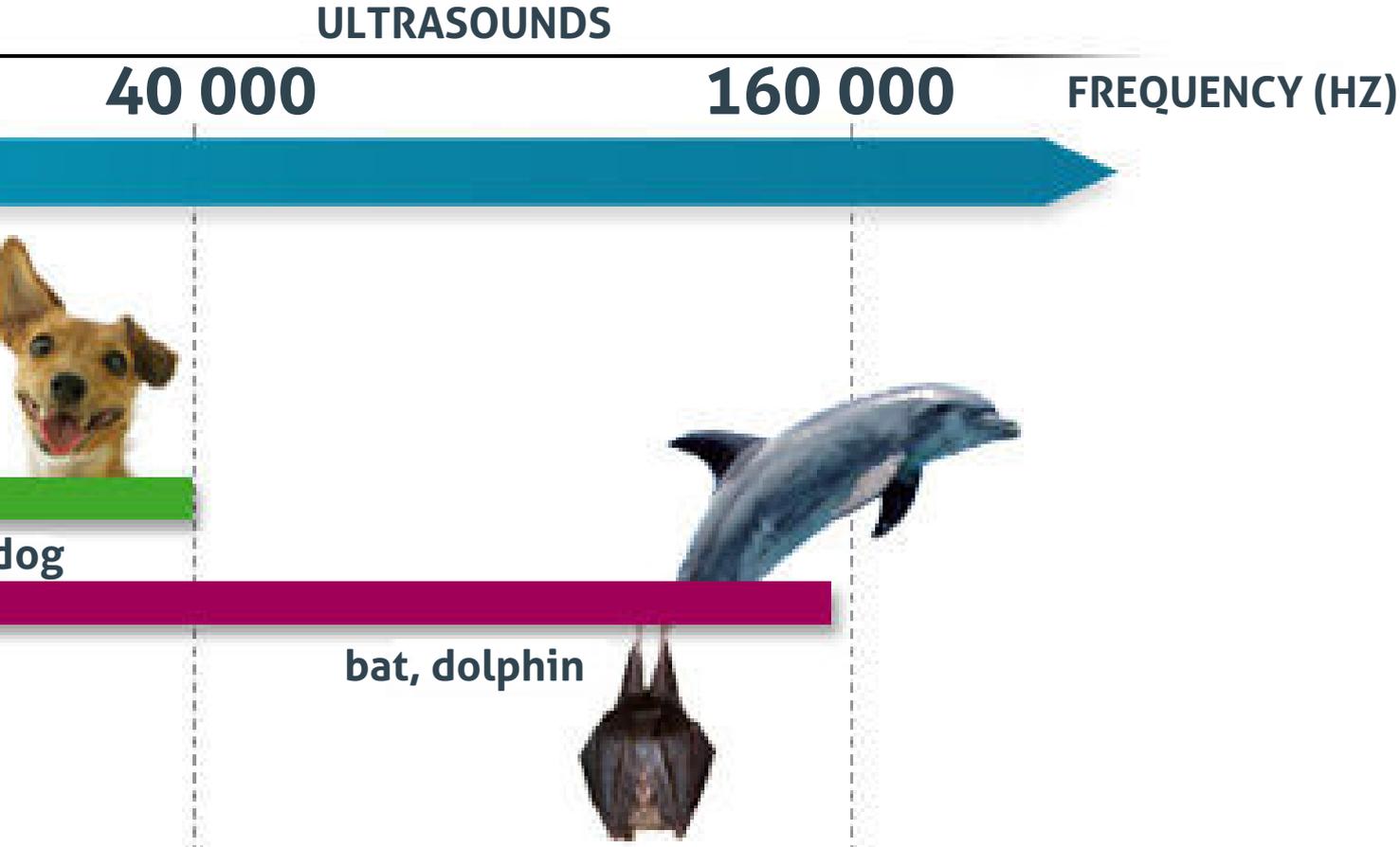
ALL TERRAIN ROBOTIC PLATFORM

When it comes to hearing, check out this auditory illusion to see how very easily humans are tricked by what they hear, depending on what they watch when they hear it.



Today, a plethora of devices exist that are used to detect even the slightest sounds, or are unharmed by the loudest of them. The human ear can be easily damaged by loud noise, and is completely deaf to most of the sound frequencies that can be detected by human devices. Even when compared to other animals, humans are quite deaf.

THUS, RELYING ON HUMAN'S HEARING AND 'SNIFFING' ABILITIES IS EITHER ANTIQUATED, OR WAS NEVER REALLY RELIED UPON IN THE FIRST PLACE.



◆ ARMS AND TOUCH

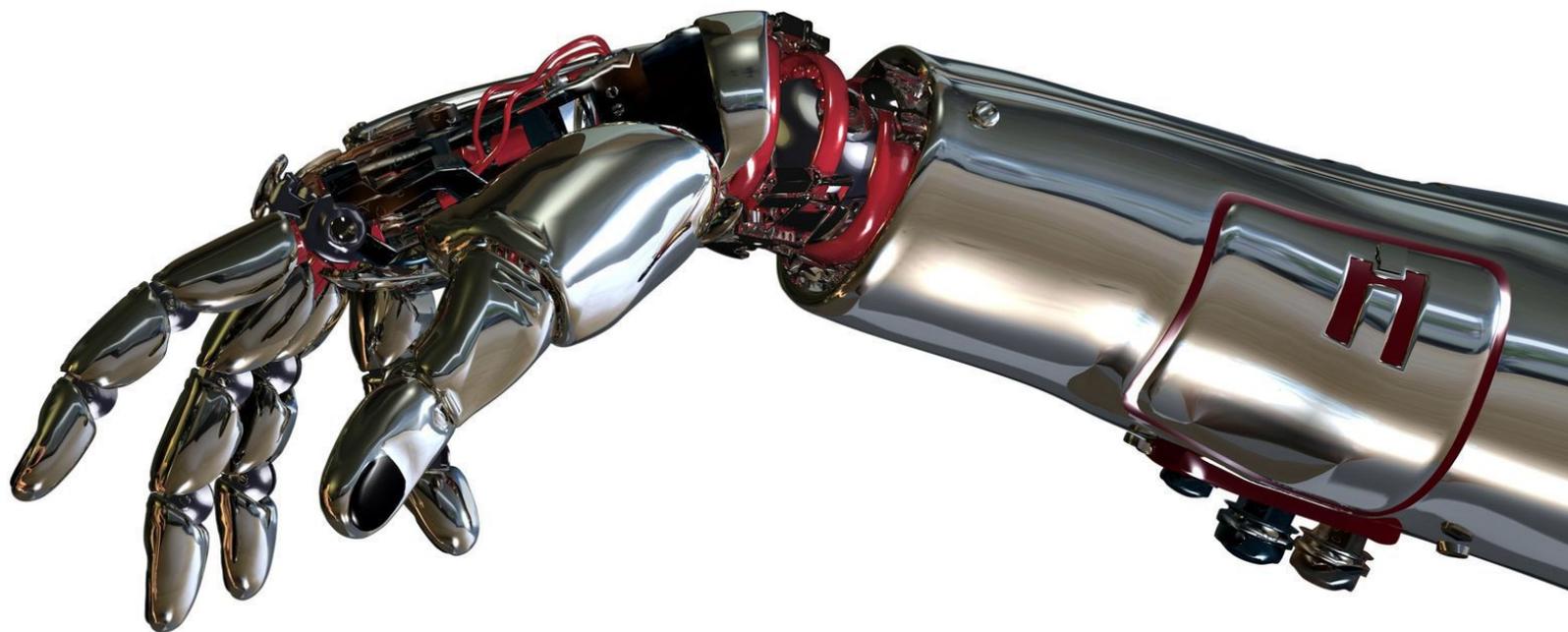
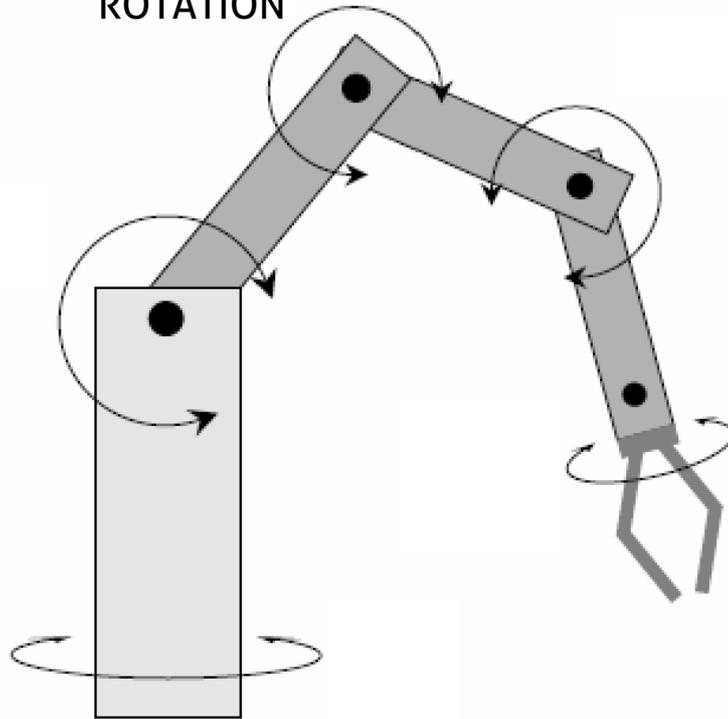
Human arms are fantastic tools. Because of them, we have mice and keyboards, space shuttles and supermarkets, clothes and written language. However, for the past 50 years since the development of modern day technologies, human arms are being systematically replaced by a variety of mechanized arms: from construction to writing, from production of any sort of products to machinery control.

We already have robots that can pretty much manufacture anything from the microscopic to the macroscopic. Looking at the huge variety of robot arms that currently exist, exhibiting so many sophisticated movements and control, human hands are already looking like 'old' tools. We have robot hands with 360 degree joint rotation, 'n' fingers with fine sensitivity to pressure and temperature, simulating our touch sensation. They are extremely robust, and come in so many shapes, forms and materials.

You can read our special TVPM edition on automation to see many examples that currently exist, so we won't go through all these examples again in this article.



ELBOW 1 ROTATION



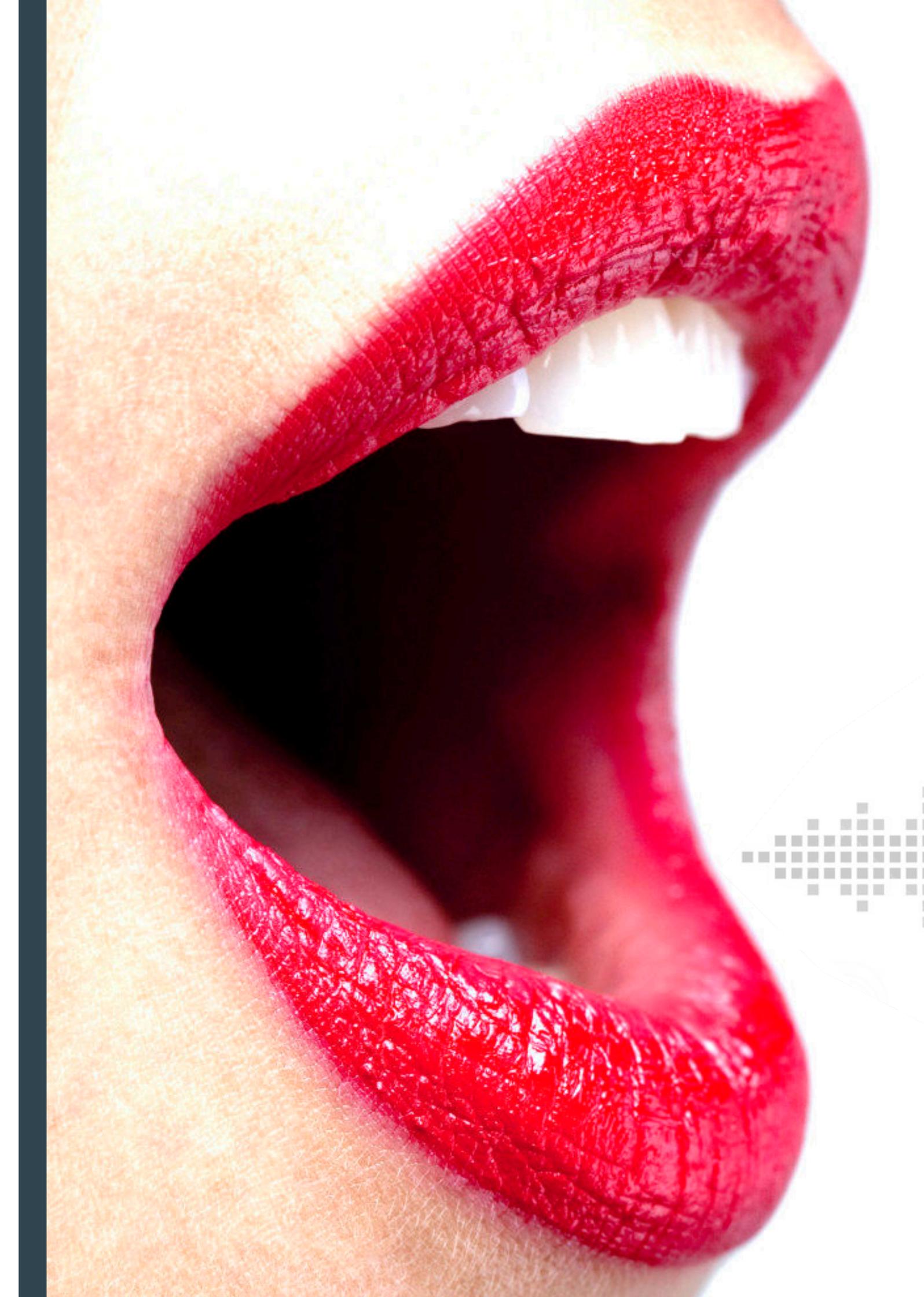
When it comes to relying on human hands to handle complex tasks, you can easily replace them with mechanical arms/tools. No human hands can screw a screw, but a screw driver can do that without any human hands. In today's world, human arms are almost useless without tools, and many of the tools can be automatically controlled by various systems or robot arms.

But we also write with our mouths or control devices with our brains. You don't need 'a human hand' these days to create something.

Stephen Hawking, a very influential scientist who has a rare form of ALS that makes him unable to move, manages to write books, scientific papers, develop new formulas, and 'talk', using only the movements of his cheek and very little movement of one of his hands.







◆ VOICE

Speaking of voice :), text-to-speech software has been gradually gaining a more and more natural voice over time. Sometimes it is hard to tell the difference between a synthesized voice and a human voice. One example is the IVONA voices collection. Listen to this short demo to hear for yourself. You can also go to ivona.com to listen to demos in more languages.

**IMAGINE SUCH SOFTWARE READING A
STORY TO YOUR CHILDREN OR
NARRATING DOCUMENTARIES INTO ANY
LANGUAGE, OR PROVIDING A VOICE FOR A
CHARACTER IN AN ANIMATED MOVIE OR
GAME - AND ALL OF THAT AVAILABLE IN
BOTH MALE OR FEMALE VOICES, IN
MULTIPLE LANGUAGES AND ACCENTS.**

◆ MOBILITY AND REACTION



Humans generally have no problem standing up. They can climb stairs, run, climb trees and react extremely quickly. Imagining a robot that can do all of that is a bit difficult, since the best robot out there that can perform such tasks that are small and easy for a human is extremely slow and very inflexible compared to a human.

However robots are continually improving, as this series of DARPA robots attest while showing great mobility in many different circumstances:



Robots can now walk, run, climb stairs, maintain their equilibrium in tough situations, and more. Do not forget though that when we think of robots as clumsy, it's because we so often test them in our human-centric world, a world full of chairs and stairs, doors and floors, and lots of walls. Thus, the mobility of a robot can be made substantially better, considering a robot can be provided with various types of propulsion, such as wheels, legs, wings, the ability to hover in the air, and more.

Try to swim faster, or otherwise out-perform a robot designed to move through water. Or try to outrun a robot with wheels. There is even a robot with 'legs' that can outrun the fastest man on Earth.

USAIN BOLT

44.72 KM/H

27.44 MPH



DARPA'S CHEETAH

45.54 KM/H

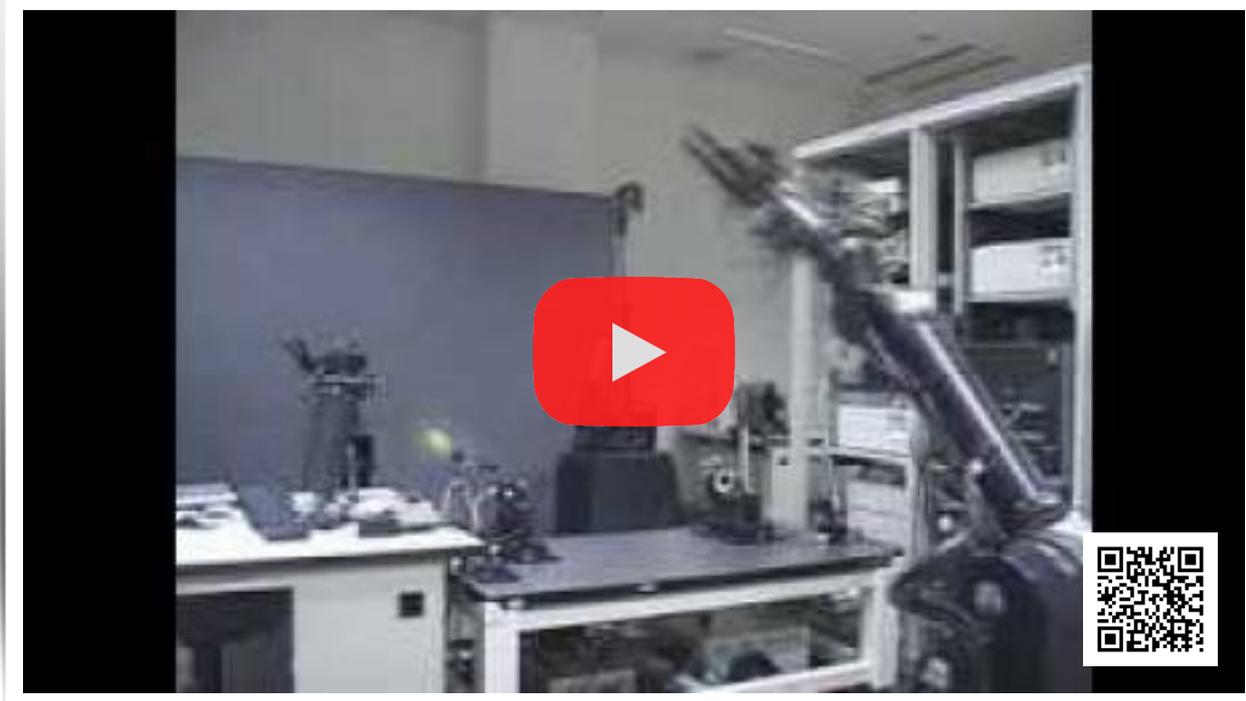
28.3 MPH



Human reaction time may seem very quick, but just take a look at this experiment to see what our human reactions look like in slow motion.



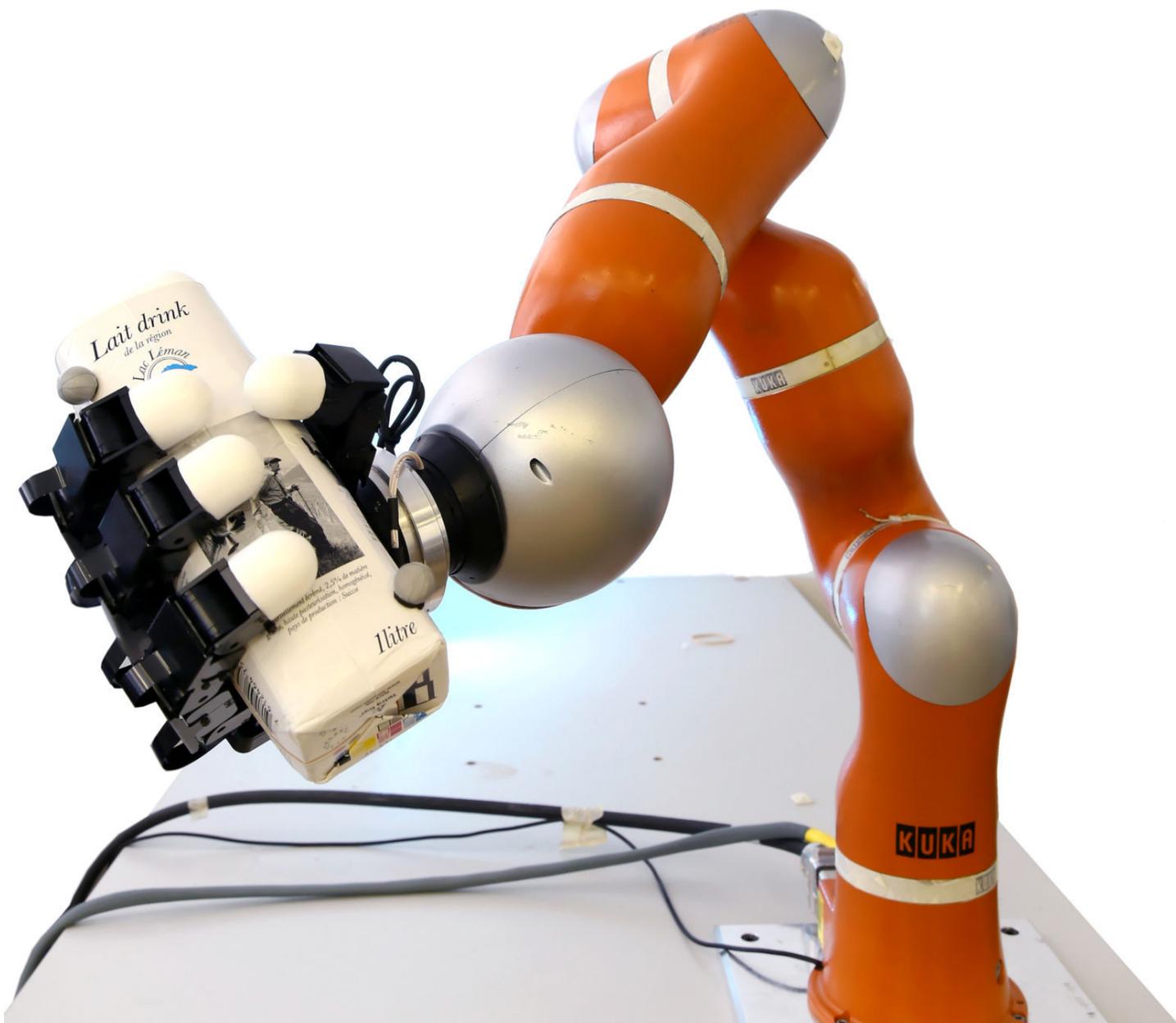
Then watch this one, with a robotic hand that is far superior at reaction time and dexterity than any human hand can be.

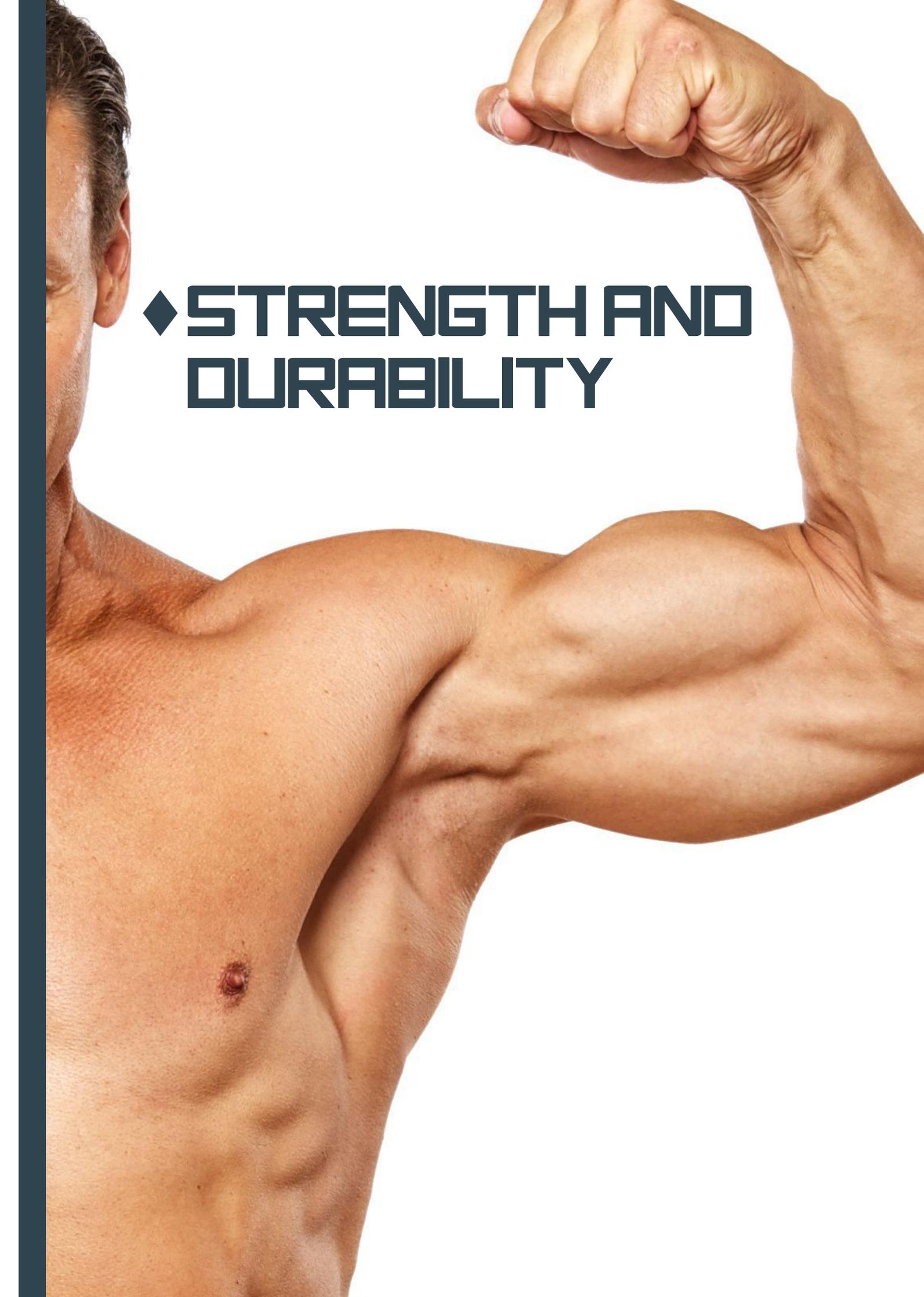


EPFL RECENTLY DEVELOPED A ROBOT HAND THAT IS **3-6 TIMES** FASTER THAN THE AVERAGE HUMAN EYE-HAND REACTION.

The robot uses a high speed camera for detecting objects and is programmed simply by manually pointing the hand at the object. The robot then recognizes the movement and adapts to catching the object tossed at it.

Watch a demo video





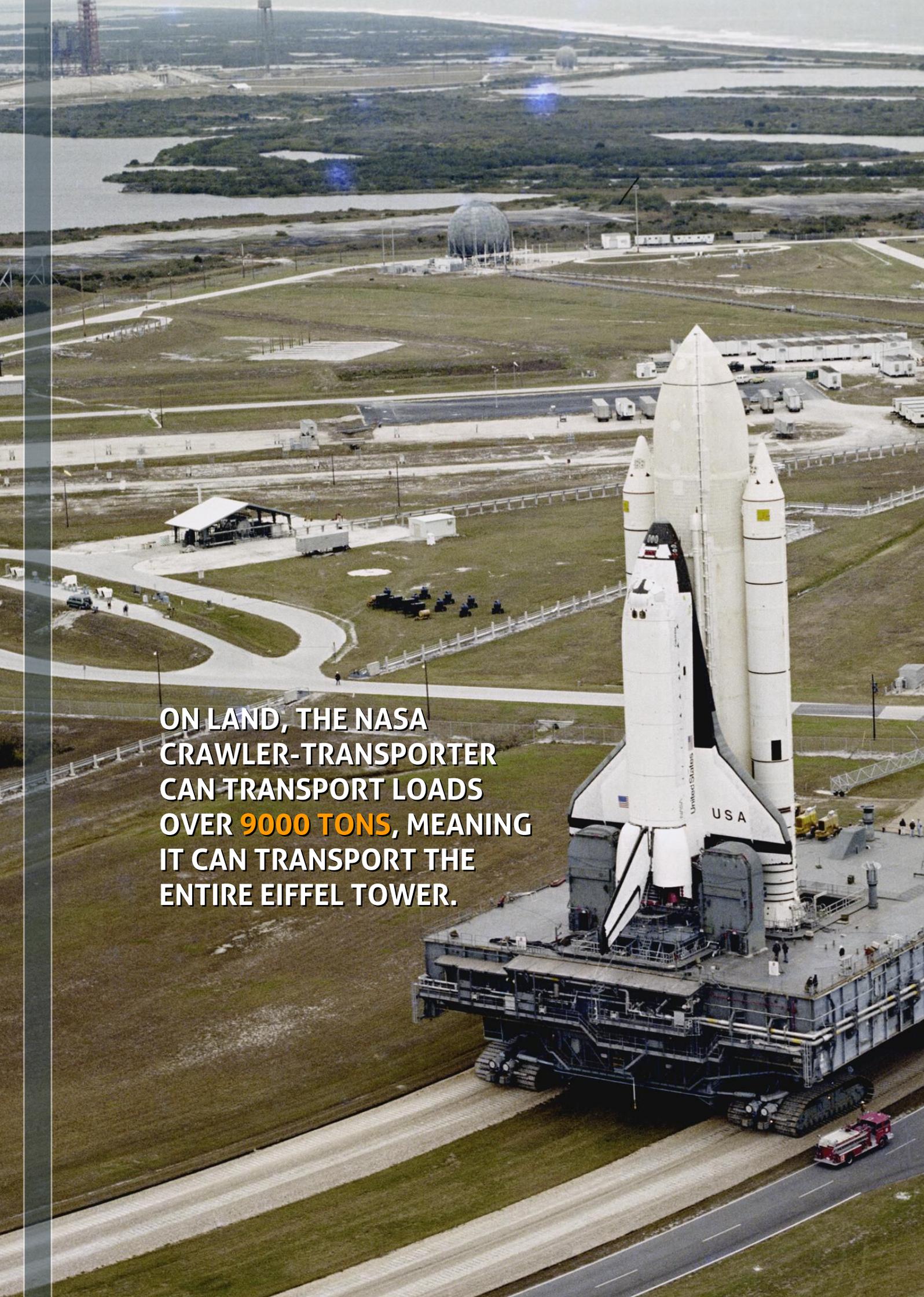
◆ **STRENGTH AND
DURABILITY**

**THE STRONGEST MAN ON
EARTH CAN LIFT AROUND
3 TIMES HIS OWN WEIGHT**

**A DUNG BEETLE CAN LIFT
A THOUSAND TIMES ITS
OWN WEIGHT**



A machine we know how to build can lift...well, perhaps an unlimited amount of weight. The days when humanity had to rely on human muscle power are long obsolete. A human is also prone to diseases, and a human needs breaks and food. A machine can work non-stop, without breaks, and is far more durable than any human.

An aerial photograph of a NASA Space Shuttle being transported by a crawler-transporter on a launch complex. The shuttle is mounted on the crawler-transporter, which is moving along a gravel crawlerway. The shuttle is white with black and grey markings, including the NASA logo and the text "USA". The crawler-transporter is a large, multi-wheeled vehicle with a complex structure. In the background, there are various launch complex facilities, including a large white dome structure, parking lots with several vehicles, and a road. The surrounding area is a mix of green grass and brown earth, with some water bodies visible in the distance. The sky is overcast.

ON LAND, THE NASA
CRAWLER-TRANSPORTER
CAN TRANSPORT LOADS
OVER **9000 TONS**, MEANING
IT CAN TRANSPORT THE
ENTIRE EIFFEL TOWER.





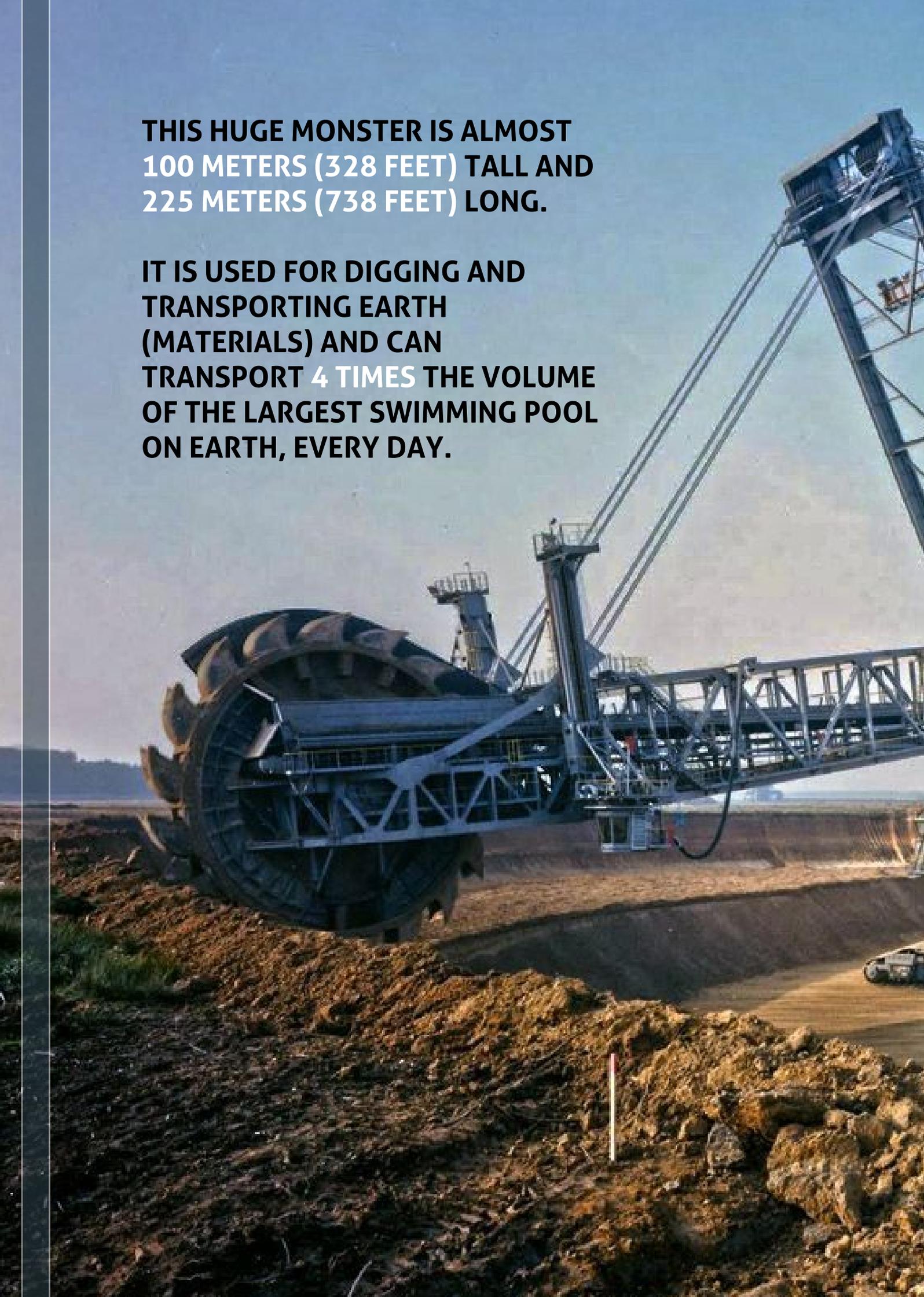
NASA'S CRAWLER-TRANSPORTER IS DESIGNED TO BE VERY SLOW, BUT THIS TRUCK IS MUCH FASTER AND CAN TRANSPORT 400 TONS AT ONCE.

THAT IS, IT CAN TRANSPORT TWO HUGE BLUE WHALES AT ONCE.



**THIS HUGE MONSTER IS ALMOST
100 METERS (328 FEET) TALL AND
225 METERS (738 FEET) LONG.**

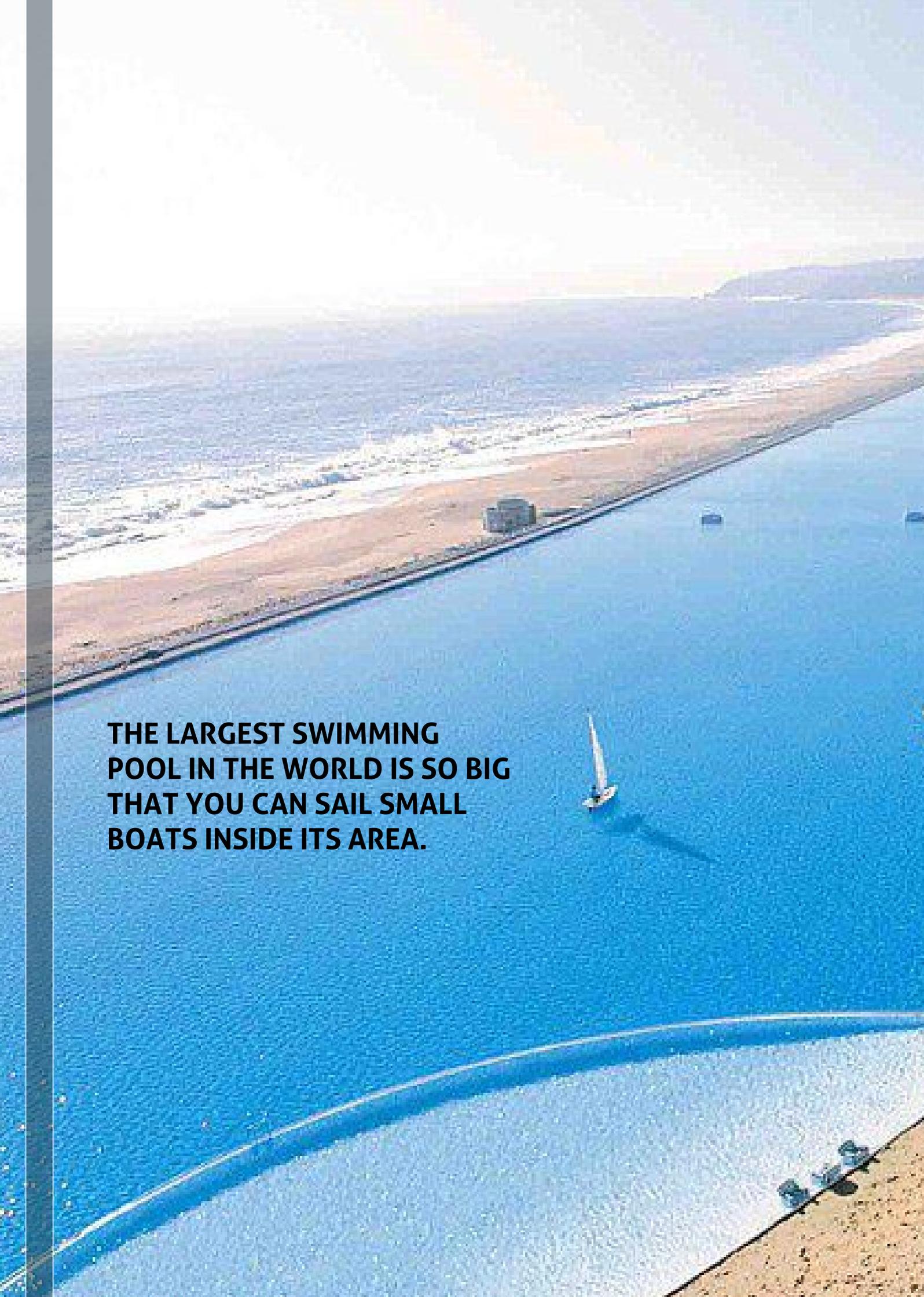
**IT IS USED FOR DIGGING AND
TRANSPORTING EARTH
(MATERIALS) AND CAN
TRANSPORT 4 TIMES THE VOLUME
OF THE LARGEST SWIMMING POOL
ON EARTH, EVERY DAY.**





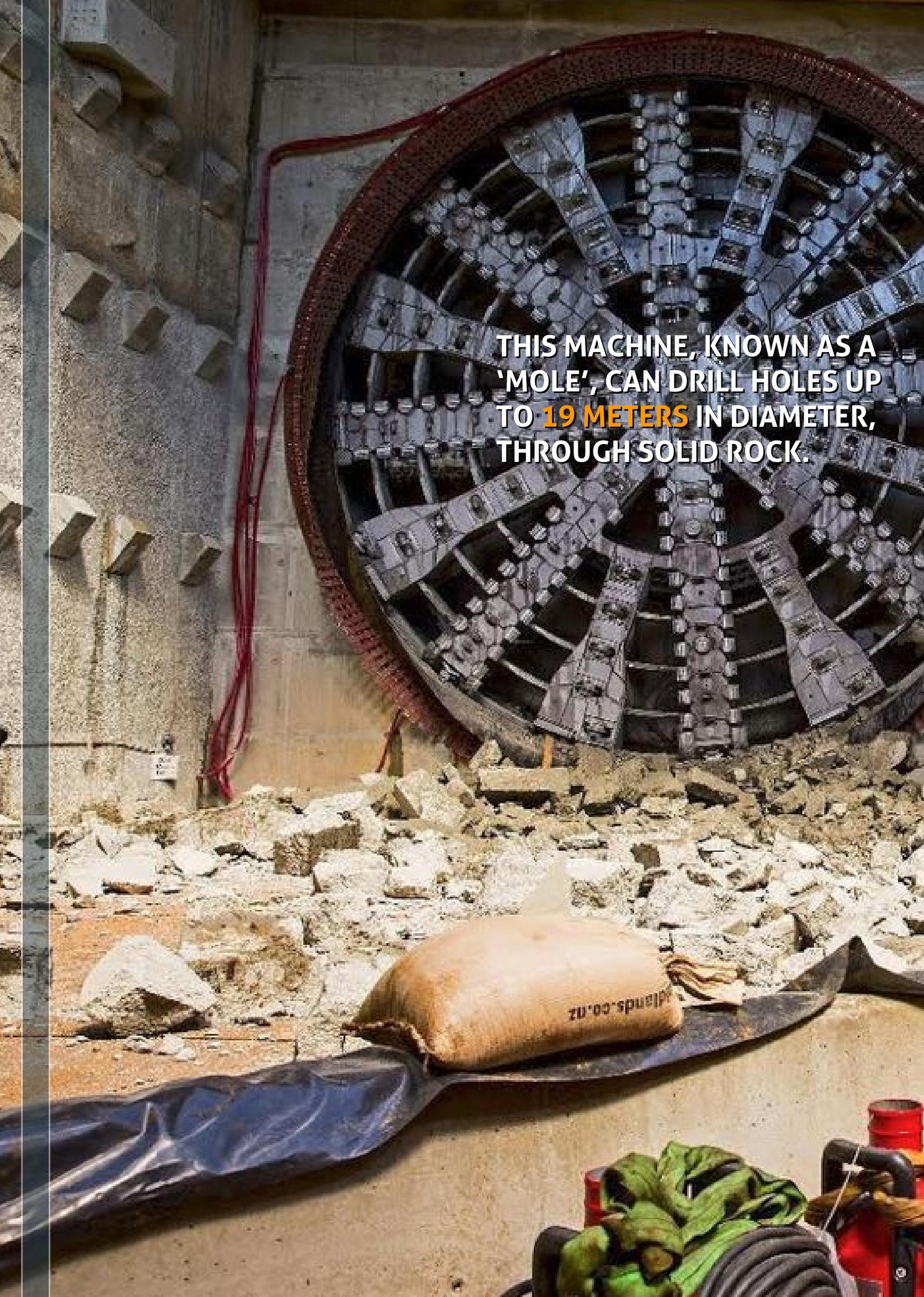
HUMANS



An aerial photograph of a massive, rectangular swimming pool. The pool's water is a vibrant blue, contrasting with the surrounding landscape. A single sailboat with a white sail is positioned in the lower-middle section of the pool. The pool is bordered by concrete walls, and a sandy beach area is visible along the top and bottom edges. In the background, a wide expanse of water meets a hazy horizon under a bright sky. The text is overlaid on the left side of the pool.

**THE LARGEST SWIMMING
POOL IN THE WORLD IS SO BIG
THAT YOU CAN SAIL SMALL
BOATS INSIDE ITS AREA.**



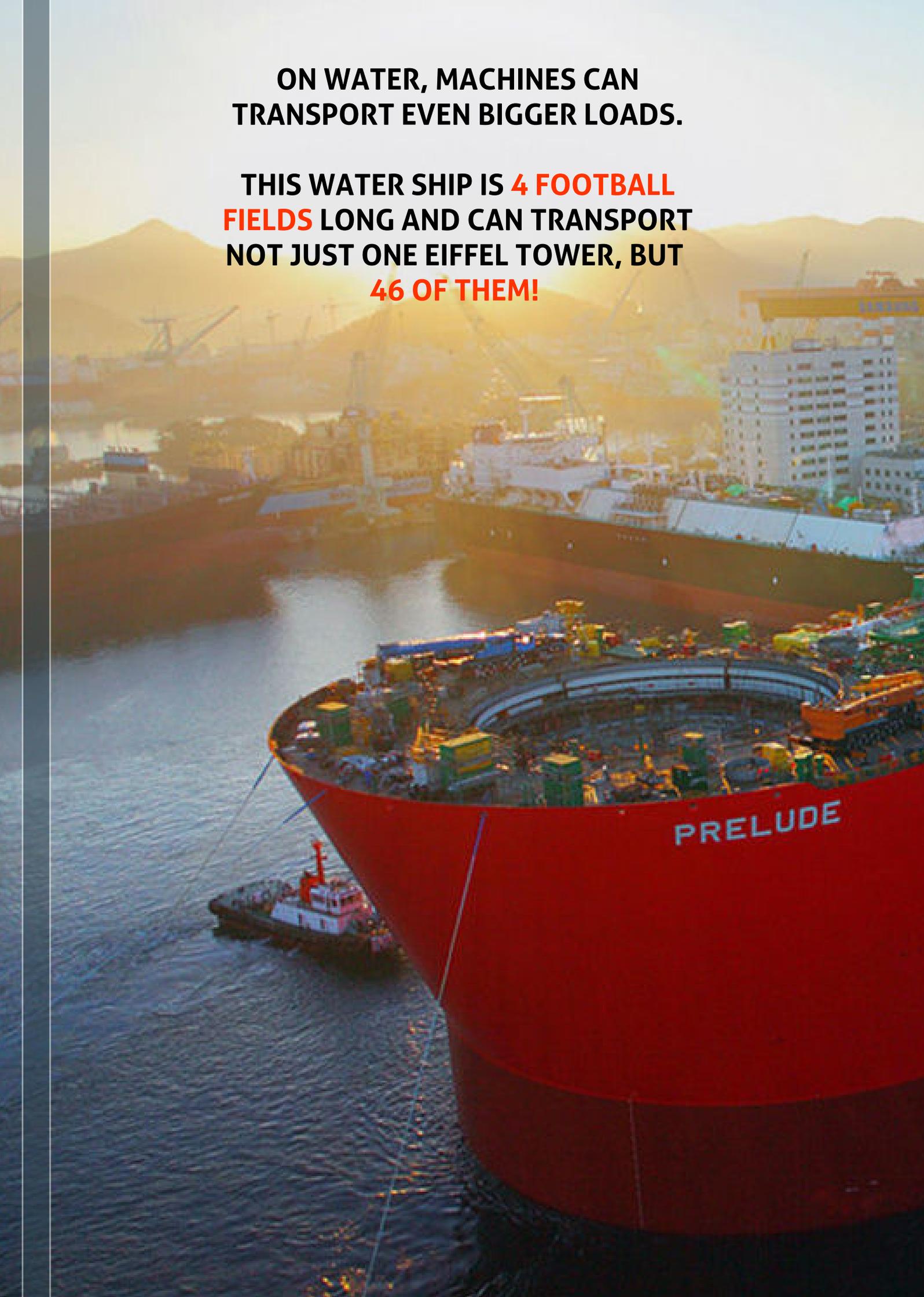


THIS MACHINE, KNOWN AS A 'MOLE', CAN DRILL HOLES UP TO **19 METERS** IN DIAMETER, THROUGH SOLID ROCK.



**ON WATER, MACHINES CAN
TRANSPORT EVEN BIGGER LOADS.**

**THIS WATER SHIP IS 4 FOOTBALL
FIELDS LONG AND CAN TRANSPORT
NOT JUST ONE EIFFEL TOWER, BUT
46 OF THEM!**





AND IN THE AIR, THE LARGEST
AIRCRAFT CAN TRANSPORT NOT 2
BLUE WHALES, BUT **3 BIG ONES,**
PLUS **6 OR SO LARGE AFRICAN**
ELEPHANTS.





◆ VISION

Our vision is not only limited to the eyes, but instead is about the eyes and the brain. So are our other senses, but for the sake of example, let's keep this simple.

Have you been out today? If so, I bet you came across many people. How many faces do you remember? Perhaps none, because the way we see is quite poor. Our eyes can only focus on their center point, and our overall attention is very limited.

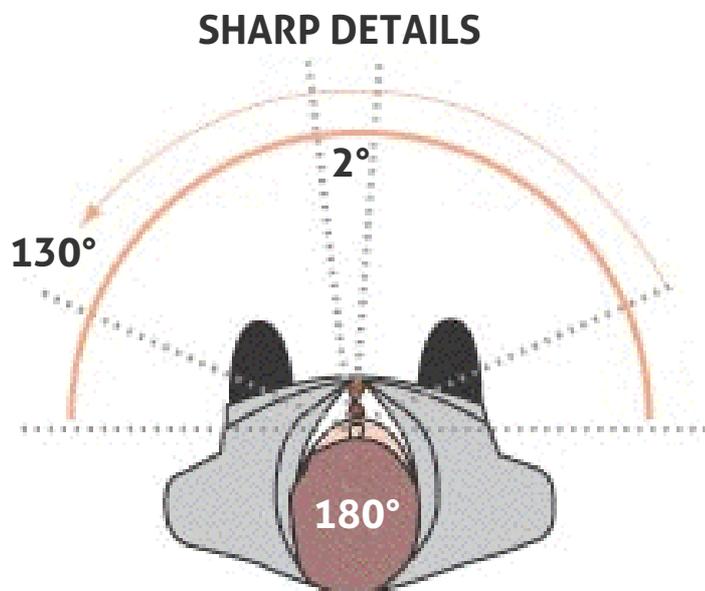


Watch this video to test your selective attention:



If you stretch your arms out at 180 degrees and then look straight forward, you will probably not see your arms anymore. More to that point, if you focus on a single word in this text, you will soon realize how the words near it become more and more blurry the farther they are from the centered word, until they just disappear from your field of view. With all that you 'see' every day, only a very small spot in your field of vision is sharp, while the rest is blurry and parts of it are colorless.(source)

Even a relatively cheap camera nowadays can capture a 360 degree video, and it has no loss of color. You can understand this 360 degree capability by watching this short video.



**HOW MUCH CAN YOU ZOOM IN ON
THIS PHOTO WITH YOUR EYES? CAN
YOU SPOT THE YELLOW KAYAKS?**



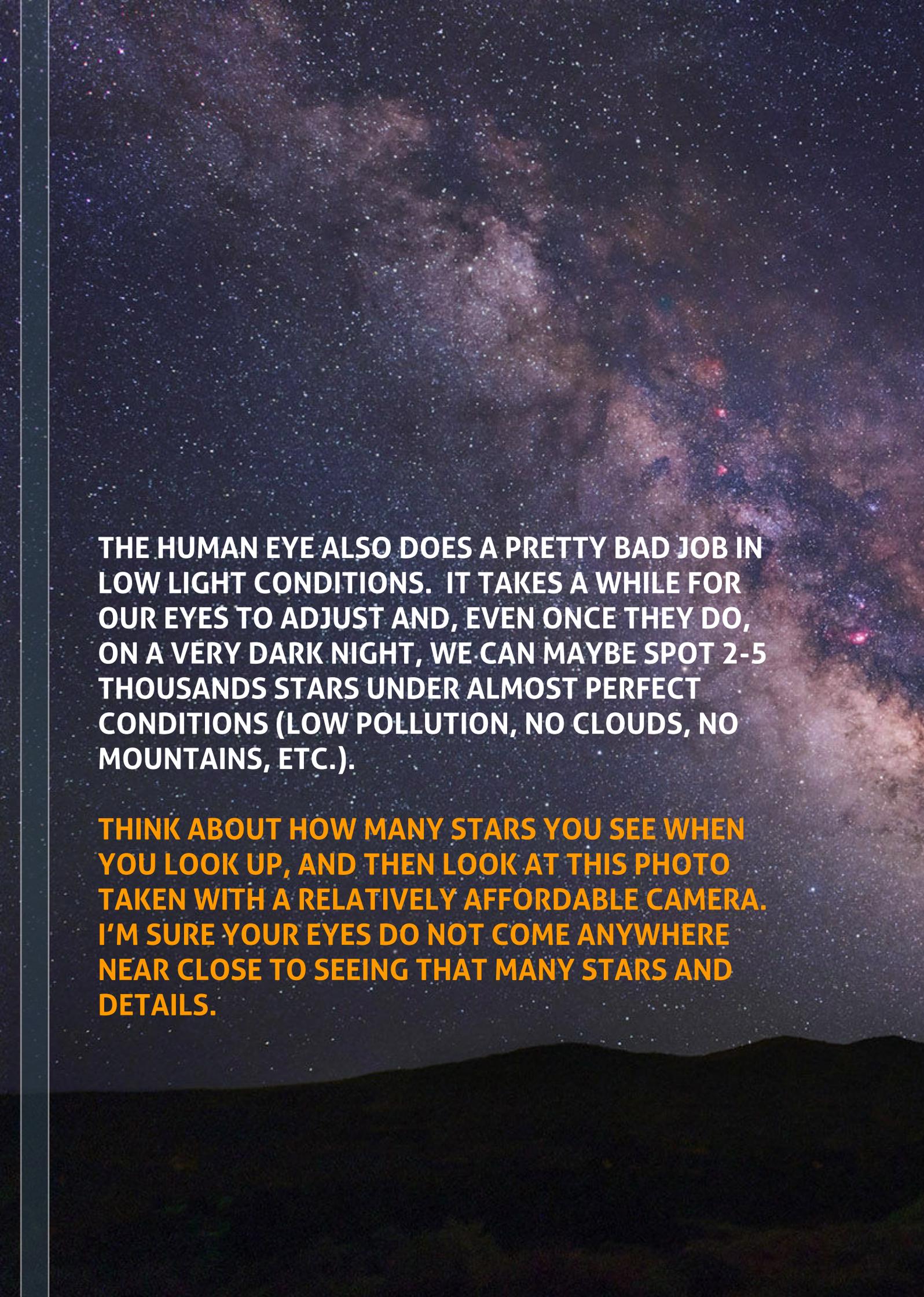
FOCUS HARD, THEY ARE HERE SOMEWHERE



There are drones that survey areas from higher than a 5 km altitude (around 3 miles) and, from there, can spot a pigeon flying close to the ground. They can also stream live footage to the ground and detecting/tracking all moving objects from cars to people.







THE HUMAN EYE ALSO DOES A PRETTY BAD JOB IN LOW LIGHT CONDITIONS. IT TAKES A WHILE FOR OUR EYES TO ADJUST AND, EVEN ONCE THEY DO, ON A VERY DARK NIGHT, WE CAN MAYBE SPOT 2-5 THOUSANDS STARS UNDER ALMOST PERFECT CONDITIONS (LOW POLLUTION, NO CLOUDS, NO MOUNTAINS, ETC.).

THINK ABOUT HOW MANY STARS YOU SEE WHEN YOU LOOK UP, AND THEN LOOK AT THIS PHOTO TAKEN WITH A RELATIVELY AFFORDABLE CAMERA. I'M SURE YOUR EYES DO NOT COME ANYWHERE NEAR CLOSE TO SEEING THAT MANY STARS AND DETAILS.

CAMERA : CANON 5D MODIFIED





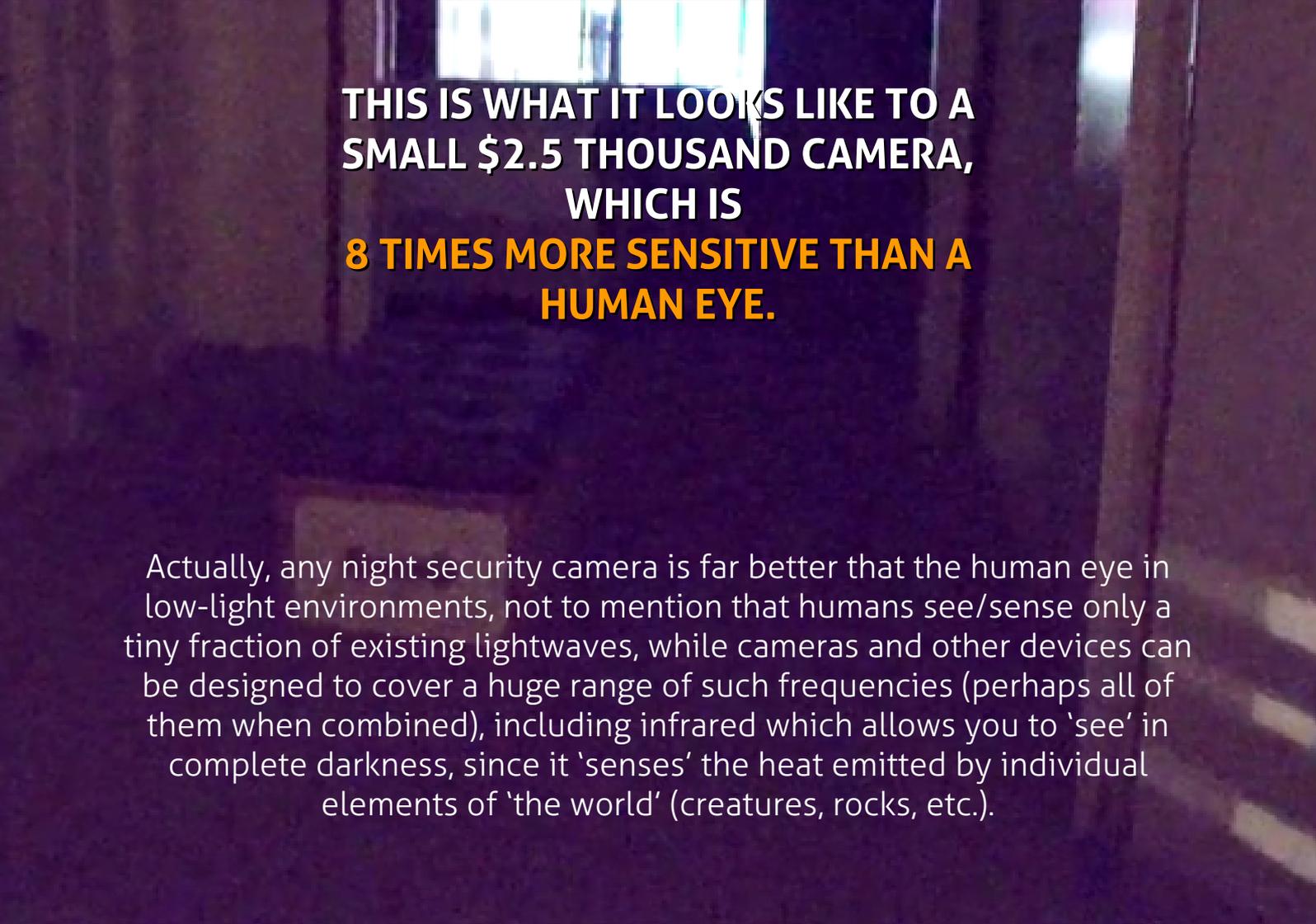
ISO 51200



ISO 409600



**THIS IS WHAT YOUR ROOM MAY LOOK LIKE
TO YOUR EYES UNDER LOW LIGHT
CONDITIONS, ONCE YOUR EYES BECOME
ADJUSTED.**



**THIS IS WHAT IT LOOKS LIKE TO A
SMALL \$2.5 THOUSAND CAMERA,
WHICH IS
8 TIMES MORE SENSITIVE THAN A
HUMAN EYE.**

Actually, any night security camera is far better than the human eye in low-light environments, not to mention that humans see/sense only a tiny fraction of existing lightwaves, while cameras and other devices can be designed to cover a huge range of such frequencies (perhaps all of them when combined), including infrared which allows you to 'see' in complete darkness, since it 'senses' the heat emitted by individual elements of 'the world' (creatures, rocks, etc.).

Have you ever tried to catch a fly with your hand? If so, you probably recognize that it's very difficult to do, and that's because a fly sees in a different way than you see. A fly can see 10 times faster than humans.

WHEN YOU WATCH A MOVIE, YOU TYPICALLY EXPERIENCE 30 PHOTOS (FRAMES) PER SECOND, WHILE YOUR EYES AND BRAIN INTERPRET THAT AS CONTINUAL MOVEMENT (A MOVIE).



A FLY WOULD NOT ENJOY SUCH A MOVIE BECAUSE IT NEEDS AROUND 300 FRAMES PER SECOND TO SEE IT AS A MOVIE, RATHER THAN A PHOTO



IF 300 FRAMES PER SECOND SEEMS LIKE A LOT, THERE IS NOW A CAMERA THAT CAPTURES **100 BILLION FRAMES PER SECOND**. THINK ABOUT THAT!



So, would you prefer to hire a human being for his visual abilities? Can a human still be a better security guard than modern day technologies? Or maybe better at observing any kind of event and be better able to spot relevant information out of what he sees? Of course not. Human vision may have been the greatest tool on the planet 100 years ago, but with the advent of photo/video cameras and other devices that can capture different light wavelengths, and at much higher resolution & speed, human vision has become completely surpassed for this kind of duty.

**But still, humans are better at recognizing objects and situations, right? Well, yes. They are still better at differentiating between cats and mice, types of cars, maybe even faces and other such 'objects' / shapes -
or are they?**

SO, LET'S LOOK AT THE BRAIN >>

◆ BRAIN AND CREATIVITY



Our brains are fantastic. No other creature has a brain that can match our capabilities. However, we are already surpassed by computers in many areas where the human brain had reigned supreme in the past.

In school, we are told to memorize information, however the internet 'stores' far more than a brain can. When was the last time you searched for something on google? Why didn't you search inside your brain? It's because you simply don't know most things. Let me emphasize that again, most of the information and knowledge that is discovered through science, you and I are not at all aware of.

That is simply because it is far too much information for anyone to retain and recall. Long gone are the days when any advanced human society relies on people to retain information for a particular job. Or at least those days should be long gone, as only an obsolete system may still require such skills.

How long does it take you to read an average-sized book? A couple of days maybe? What if the book had 10 billion pages?

Even if you read 1000 pages a day (which is insane), it will take you 10 million days to finish the book.

That's around 27 thousand years of continuous reading.

You would have had to start back at a time when there were no or few humans in North and South America in order to finish that book today.

THE IBM WATSON COMPUTER CAN DO THAT IN 43 MINUTES.

NOT ONLY CAN THIS COMPUTER SCAN 10 BILLION FILES IN 43 MINUTES, BUT EVEN DRAW POWERFUL CONCLUSIONS FROM THEIR CONTENTS TO HELP WITH DIAGNOSING DISEASES, UNDERSTAND NATURAL LANGUAGE, AND EVEN COME UP WITH UNIQUE RECIPES.(SOURCE)



The trend with computers today is the big data that it is gathered daily. From smart health tracking devices to facebook posts, youtube videos, blogs, security cameras, and smart fridges, a huge amount of data is created every day. So huge that if you add a 100gb hard drive to your computer, you would need 25 million more of them to store all of the data that it is produced in a single day.(source)



**IMAGINE THE ENTIRE POPULATION OF AUSTRALIA,
EVERY SINGLE PERSON LIVING THERE, HAVING A
100GB HARD DRIVE FULL OF DATA. THAT IS HOW
MUCH NEW DATA IS PRODUCED EVERY DAY.**

That is the key for how smart computers have become: big data. The type of computing that can mine all of this data is called cognitive computing. Many consider what we are experiencing with cognitive computing as a new era in computers.

1900



First came mechanical systems that counted things (1900). Those machines evolved into electro-mechanical devices over time.



1950

In 1950, there was a major shift where these types of systems switched over to programmable systems, the ones that we still use now. You program these machines to do tasks (like apps on your smartphone), and they do them.

However, many experts claim that in 2011, another switch happened and we are now in the embryonic phase of it; an era where computers actually learn, becoming smarter with time. The interesting thing about this new kind of computing is that it learns like a human being, through examples and repetitions. And the more data you feed into it and the more you allow it to learn, the 'smarter' it becomes. There is nothing 'magical' about this, since it's basically following a bunch of statistics and rules, coupled with the ability to understand natural language. These computers read, literally, billions of documents, looking for patterns to highlight.

2011

The only way to adequately explain these new computer systems is to give you an example:

Let's say you want to book a trip to a place where the temperature is not too hot, but not too cold. You want the trip to occur in 2 months time. You want the hotel to have a swimming pool, sushi in the menu, and you'll bring your wife and 2 kids with you. You also want to do scuba diving to see some coral reefs while you're there, and the kids want to enjoy a rollercoaster ride. For the sake of providing a present-day example where we use money for barter, you also have a budget in mind for your trip.

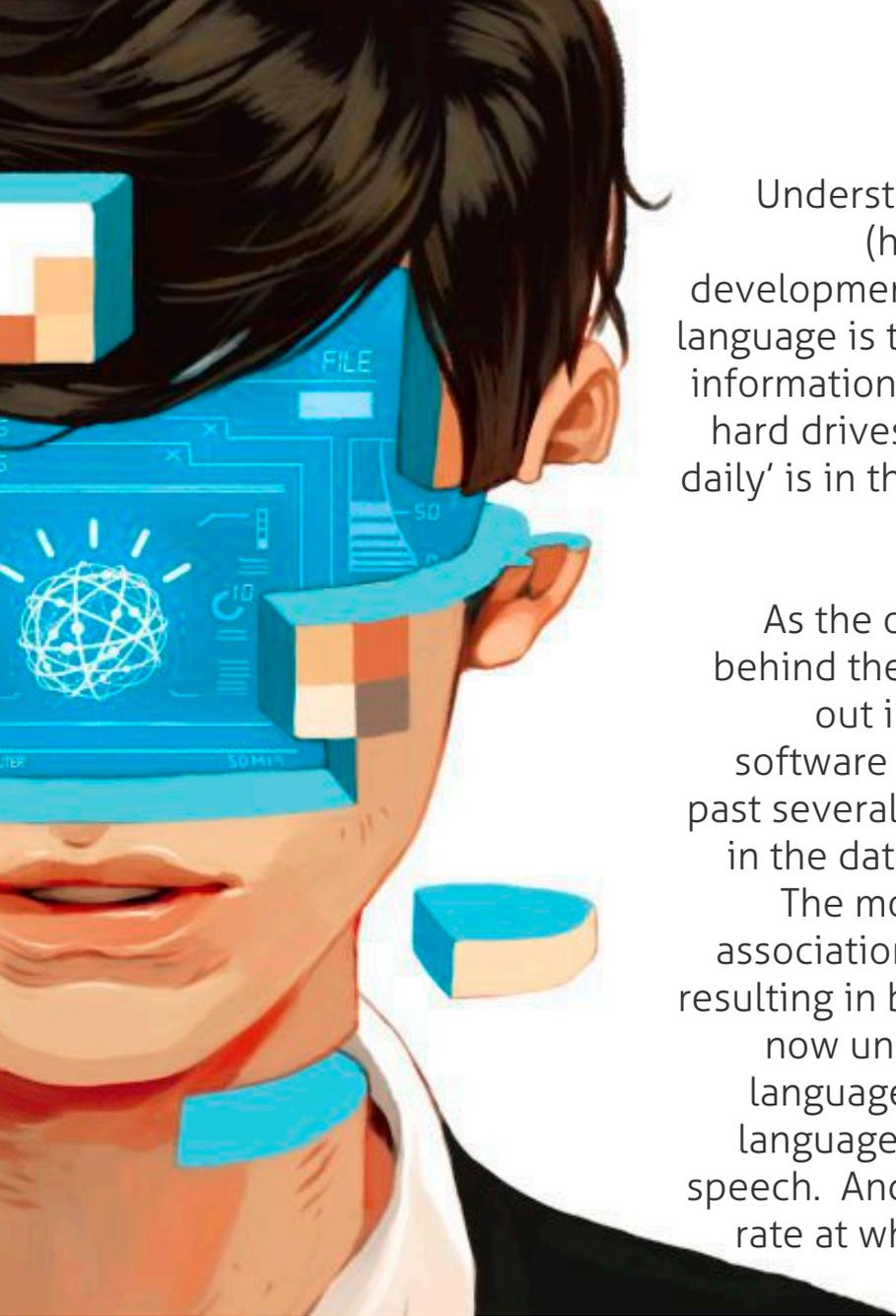
In today's world, how would you go about trying to find such a location? Maybe you could start by asking people around you, although they know very little about the world and such places, or hunting through many holiday-planner websites where you can select certain keywords and categories, but not come anywhere near as specific as what you have in mind for this trip.

Now here comes cognitive computing with an IBM Watson-like app, where all you need to do is to say, using natural language, what you want from the trip, as exemplified above. The app searches through wikipedia, facebook and twitter posts, tripadvisor websites, and other digital sources, interprets the data in a comprehensive way, and finds the perfect location for your holiday. It's as simple as that.

You can apply the same approach for finding a diagnosis for your symptoms, learn about anything you want to, or just ask any kind of question to be provided with relevant advice.

THESE SYSTEMS ARE ALREADY TESTED AND FUNCTIONAL, BUT NOT YET WIDELY AVAILABLE FOR PUBLIC USE.





Understanding natural human language (how we speak) is the key for fast development of such computers, as natural language is the main source of unstructured information. 80% of the '25 million 100gb hard drives worth of data that is produced daily' is in the form of this kind of untapped and unstructured data.(source)

As the original inventor of the software behind the IBM Watson computer pointed out in this TED talk, even though the software has not changed much over the past several years, the big change has been in the data that the software can tap into.

The more data it is provided, the more associations and connections it can make, resulting in better statistics. Computers can now understand natural human written language and even translate it from one language to another or recognize human speech. And while they are not perfect, the rate at which they continually improve is phenomenally quick.

AT PRESENT, THEY ARE AT JUST 1% ACCURACY IN RECOGNIZING OBJECTS FROM PHOTOS WHEN COMPARED AGAINST EXPERTS, AND AT OVER 97% ACCURACY AT RECOGNIZING HUMAN FACES (BETTER THAN HUMANS).

There are computers today with millions of nodes and billions of connections, although the human brain has billions of nodes and trillions of connections. However, based on Moore's law (the observation that the number of transistors in a dense integrated circuit doubles approximately every two years - and we have been experiencing that for decades), we will reach the human brain's capacity of nodes and connections within just 25 more years. You and I, if you are not too old :) and don't get hit by a car and die, will still be alive to take advantage of this huge computational power. Learn more about the Watson computer and its amazing present day capabilities in this talk.

◆ ONE ON ONE



Hands down, machines beat humans at so many levels when it comes to memory, decision making, or face recognition (and it's getting close for object recognition). It still has difficulties with translation and speech recognition, however, they are literally getting better at those every single day.

Computers can also write stories and news articles (in a very quick and accurate manner), compose songs, poetry, or even paint.

Keep in mind that when a human writes, he uses his pointy 'tentacles' (fingers) to physically push some buttons on a keyboard, or to press the point of a stick while dragging it across a piece of paper. A machine need's none of that.

IF: from vision to hearing and odor (and other) sensing; from strength and durability to speed, mobility, decision making and voice recognition/translation/replication; memory and data mining; robots/machines/computers/software is/are already better or close to human capabilities, **THEN** what jobs are left for humans since these machines can drive, be doctors or assistants, in perhaps any domain, function as managers, and can create unique recipes, songs, or articles; build things, maintain them, and make new, important discoveries faster than all of humanity combined?

IT'S NOW EASIER TO THINK OF WHAT HUMANS ARE STILL BETTER AT HANDLING, MEANING WHAT JOBS CAN'T BE REPLACED THUS FAR, THAN TO THINK OF WHAT JOBS CAN BE REPLACED.

There are still some domains where humans are better than robots, and these domains tend to not be 'jobs' in today's world, which is a positive note. Humans seem to be very good at interacting with other humans: providing moral support, teaching, being creative and inventing new things. Even though robots are starting to become good at reading human emotions, making discoveries on their own out of big data and in lab research, replacing teachers' interaction with children, or even at the art of 'debate', we are far from becoming useless creatures.

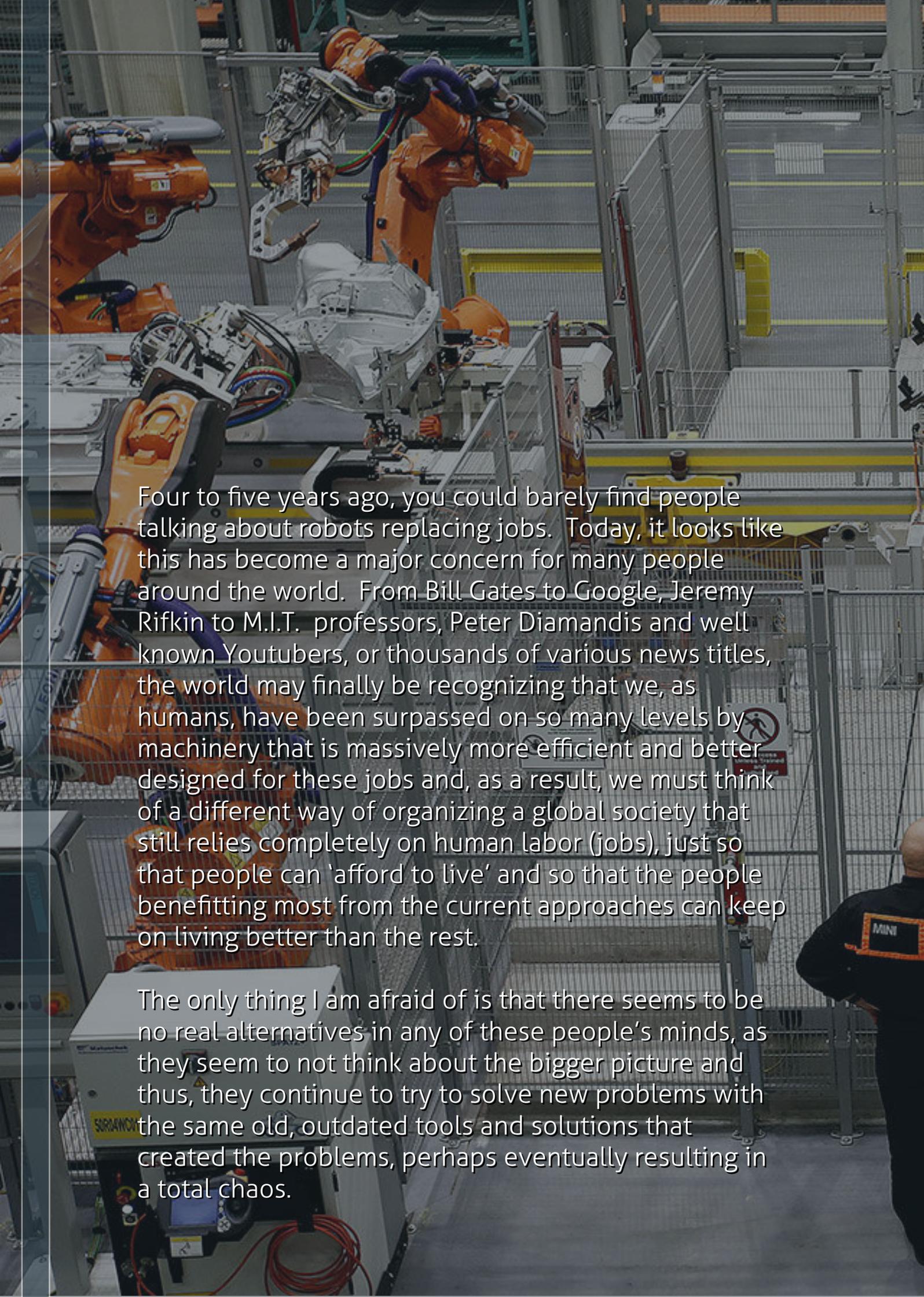
THE TECHNOLOGY IS LIKE A PIANO, AND WE ARE THE ONES MAKING THE MUSIC. JOBS ARE AN OUTDATED IDEAL, OVERLY OBSOLETE OVER THE PAST 50 YEARS, BUT WORK IS SOMETHING DIFFERENT.

While the use of sophisticated computer systems will surely continue to expand in controlling complex systems like transportation or production, mining big data to arrive at better decisions, discovering new things (from medical treatments to perhaps important mathematical formulas), composing original work (from documentary scripts to music), and more, we humans are the ones for whom all of this is made, and we will be part of it (discovering right alongside them, creating and innovating, enjoying and educating).

We are still the only ones who can look at all this and inject meaning. No robot will look at the stars and be in awe, asking what is its place in the universe, at least not for many years to come (or maybe never). No robot will fight for creating an equal society for all or for taking better care of the environment.

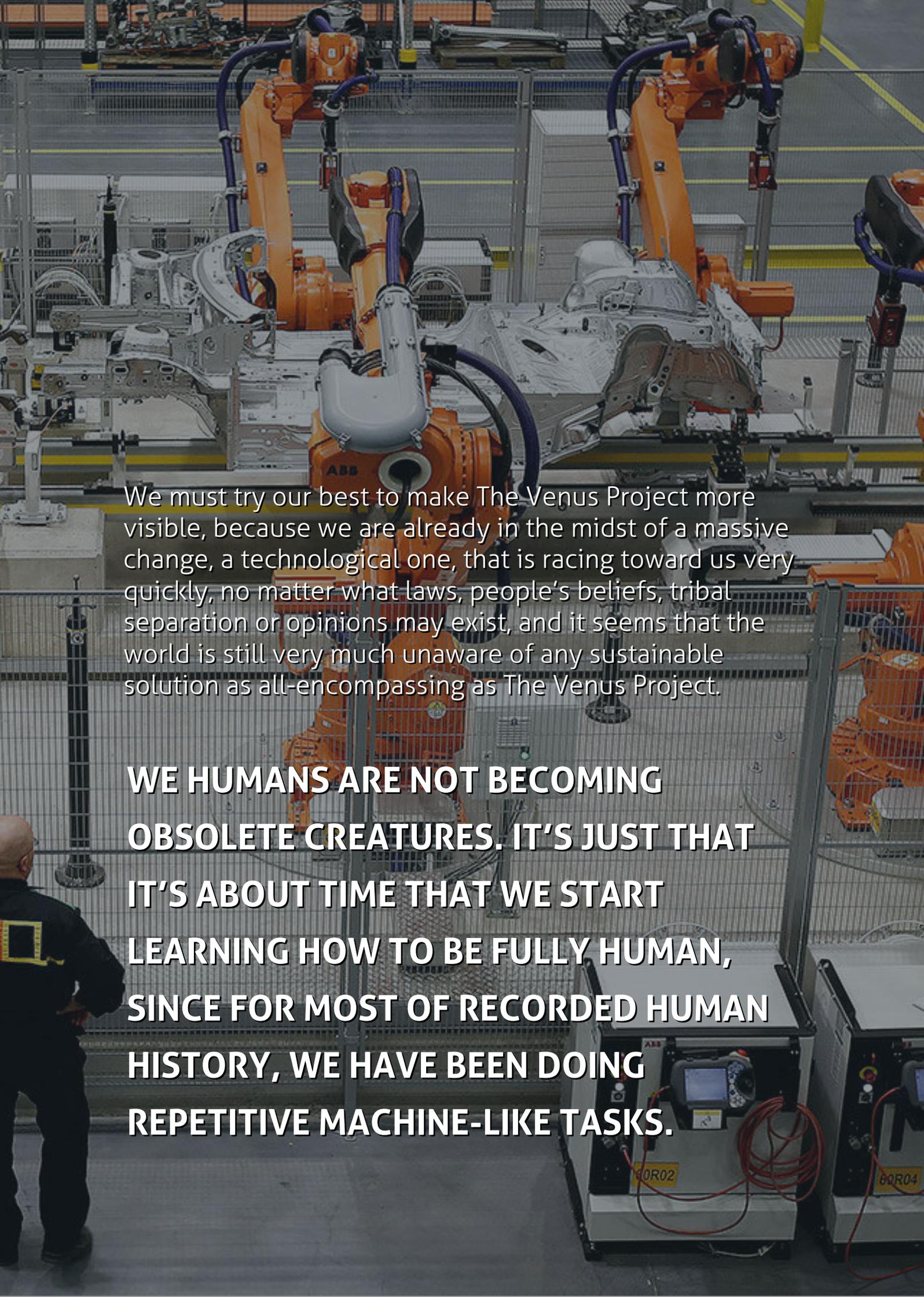
A person is perched on the edge of a dark, rocky cliff at night. They are holding a flashlight, and a bright beam of light shines out from the lens, illuminating the dark sky and the surrounding landscape. The background is a vast, starry night sky with a gradient of colors from dark blue to green. The cliff face is rugged and textured, with some shadows and highlights. The overall mood is one of exploration and discovery.

**COMPUTERS, ROBOTS,
DEVICES, AND MACHINES ARE
TOOLS,
OUR TOOLS, AND WE NEED TO
TAKE ADVANTAGE OF THEIR
ABILITIES WITHOUT BEING**

A photograph of a modern industrial factory floor. Several large, orange robotic arms are positioned at various stations along a production line. The robots are actively working on components, likely automotive parts. The background shows a complex network of metal frames, pipes, and machinery, typical of a large-scale manufacturing facility. The lighting is bright and even, highlighting the metallic surfaces and the vibrant orange of the robots.

Four to five years ago, you could barely find people talking about robots replacing jobs. Today, it looks like this has become a major concern for many people around the world. From Bill Gates to Google, Jeremy Rifkin to M.I.T. professors, Peter Diamandis and well known Youtubers, or thousands of various news titles, the world may finally be recognizing that we, as humans, have been surpassed on so many levels by machinery that is massively more efficient and better designed for these jobs and, as a result, we must think of a different way of organizing a global society that still relies completely on human labor (jobs), just so that people can 'afford to live' and so that the people benefitting most from the current approaches can keep on living better than the rest.

The only thing I am afraid of is that there seems to be no real alternatives in any of these people's minds, as they seem to not think about the bigger picture and thus, they continue to try to solve new problems with the same old, outdated tools and solutions that created the problems, perhaps eventually resulting in a total chaos.



We must try our best to make The Venus Project more visible, because we are already in the midst of a massive change, a technological one, that is racing toward us very quickly, no matter what laws, people's beliefs, tribal separation or opinions may exist, and it seems that the world is still very much unaware of any sustainable solution as all-encompassing as The Venus Project.

**WE HUMANS ARE NOT BECOMING
OBSOLETE CREATURES. IT'S JUST THAT
IT'S ABOUT TIME THAT WE START
LEARNING HOW TO BE FULLY HUMAN,
SINCE FOR MOST OF RECORDED HUMAN
HISTORY, WE HAVE BEEN DOING
REPETITIVE MACHINE-LIKE TASKS.**



FAQ

with Jacque Fresco and Roxanne Meadows

In all your books, but most of all in *The Best That Money Can't Buy*, you deal among other subjects (as the need to rethink the set of priorities of society, to suppress crime and war, to take care of our planet's health...) also with the need to understand the close bond that man entertains with nature: which are the properties of the world (planet-society) that have to change to re-establish this bond?

Great achievements of present day technology were developed by very few people. The future does not depend on political solutions-rather, they are technological in nature.

Social change is not brought about by individual ideas, but more or less depends upon the evolution of society and the bio-social pressures responsible for social change. It is brought about by natural or economic occurrences, which threaten large numbers of people.

Some of the conditions responsible for social change are limited resources, war, overpopulation, epidemics, natural disasters, economic recession, downsizing on a mass scale, technological displacement of people by machines, and the failure of their leaders to overcome these problems.

The changes that may occur are not necessarily for the betterment of society unless a large number of people are familiar with the physical nature of the earth and the interrelationship of ourselves with it. In other words, our decisions must be in accordance with natural law and with the carrying capacity of the earth's resources. A given amount of land can only support so many people. If the population exceeds the carrying capacity, there will be territorial disputes, crime, wars, homelessness, poverty, and countless other hardships.

All man-made laws and treaties are artificial. They are rarely based upon the physical factors responsible for human values and behavior. People brought up in scarcity are more apt to steal no matter how many laws and treaties are enacted. It is not laws and treaties that people need--it is access to the essentials of life - clean air, water and arable land along with a relevant education based upon the physical sciences.

THE CRUISE-LINER CITY

by Tio

Many people regard a city as a big community of people separated from other communities, and it is defined as such only because of border separation. This should not hold true anymore, given our current state of technology and present-day scientific knowledge. A city should be defined not by its borders, but by its total enclosure, self-sustainable properties.

Consider that when we think about a cruise liner, we see it as a total enclosure system. The cruise liner has its own food supply, medical staff, runs on its own energy, and basically provides all of the goods and services that the occupants' need throughout the time of the journey.



Cities should be no different from this perspective. A city should be regarded as a total enclosure system, with its own production of energy, goods, and services, wherever possible. A cruise liner needs to have all the necessary resources and energy to operate for the duration of the journey, independent of offshore supplies, or else it will fail as a system. To minimize material and energy waste, a city should not depend primarily on imports and/or exports to maintain its sustainability, although we're not excluding those options completely.

Another important aspect about a cruise liner is that instead of a kitchen in every room, it makes intelligent use of a common dining area. This saves a lot of resources

and

provides a more efficient, enjoyable, and varied option for people. Thus, a city is not only about what it can produce and how, but is also about a shift in how people think about their social life.



A car, a fridge, a microwave, a lawnmower, and much, much more, for everyone, is not an intelligent way forward. Access to free and ever-present services that produce the same or better outcome is what we need. Instead of having a car, why not build a very efficient transportation system inside the city (including self-driving cars), that will make owning a car obsolete?

Food and goods production can be localized with vertical farms or 3D printing, while the automating of all of their processes enhances efficiency. As an example, printing houses can 'inject' more complexity, while using less resources, due to its layer-by-layer process for adding materials. In some circumstances, using extrusion technology to produce an entire apartment or house may be even more efficient.

Extracting water from the atmosphere is no longer a science fiction idea, which illustrates that when human ingenuity is put to work, issues like water scarcity are not a problem for long.



The designs of buildings or their interiors should reflect not an artist's point of view, but an engineer's educated creativity, to take advantage of the environment and human anatomy. A chair can be made fancy to reflect a false social status, or designed by a doctor to improve your physical health. A house can be designed to deflect heat, or to use space more efficiently. This is science over art.

Automation and efficiency of accessibility that can create an abundance of goods and services, coupled with proper education, could transform a city into a place where the workload on people will be diminished or dissolved, allowing every human to explore, relax, enjoy, further educate or engage in scientific research. Where there is abundance, money or any kind of barter makes no sense at all. Perhaps the cities of the future are more about a new way of thinking rather than new technologies. Not owning, but using - not buying, but accessing.

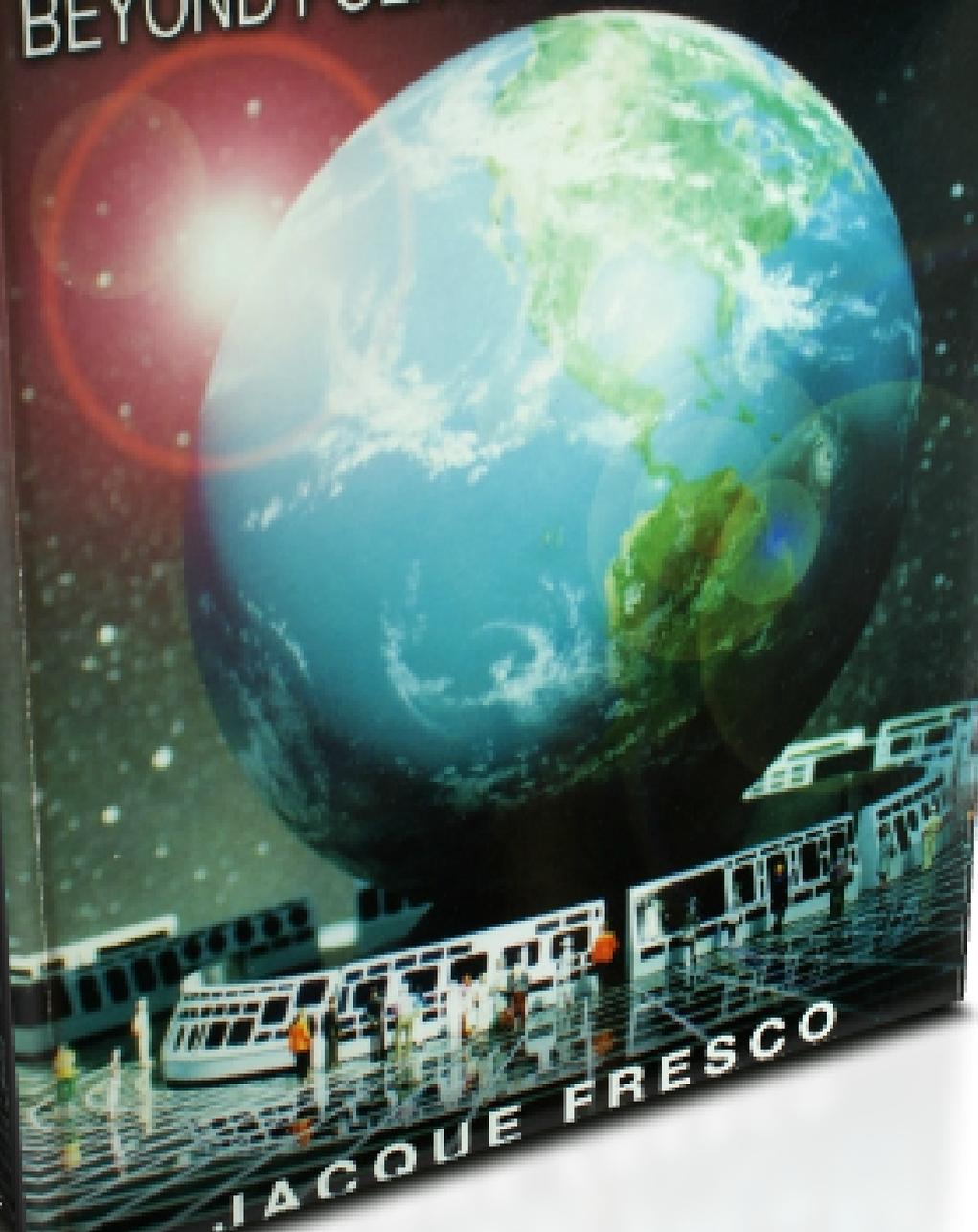


All cities across Earth should not be like skin melanoma that endangers one's health, but rather like freckles that pose no harm to the human body - leading to cities that pose 'no harm to the planet'. If a cruise liner spills oil in the ocean, it endangers not only the cruise liner occupants lives, but the marine life as well, because all of Earth's systems are inter-connected.

Cities should be our 'cruise liners': self sustainable, smart and interconnected, and in good relation with the environment. What a journey that would be...

THE BEST THAT MONEY CAN'T BUY

BEYOND POLITICS, POVERTY, & WAR



FRESCO

THE BEST THAT MONEY CAN'T BUY

JACQUE FRESCO

Although future technical changes are far beyond anything we can imagine today, the most profound effects would not be in the new technologies themselves, but rather in how we conduct our lives and manage our social institutions. As we move toward a cybernated world, most people will no longer be needed to manage and operate this emerging civilization. The world's fragmented social systems will be supported by a network of computerized centers and operations.

Excerpt from *The Best that Money Can't Buy*, by Jacque Fresco

PURCHASE IT

By purchasing the book from here, you will also be supporting The Venus Project Research Center in Florida. We showcase what a world without money can look like, one that cares for the needs of all people, but we are still living in a monetary-based world and still have to do all that we do within the current system's rules. We thank you very much for helping us by purchasing the book here.

EARTH: EVENTS

by Tio



What is an event? Maybe it's just a thing that happens, especially one of significance. But significant for what or for whom? From what goes on inside your guts to events that happen over a period of millions or billions of years, how 'on Earth' can we present some of the most important events? It's hard, but we will do our best to show you some interesting ones.



SHAPES AND VIBRATIONS.

A vibrant red umbrella is shown from a low angle, partially open, against a dark, rainy background. The umbrella's canopy is covered in water droplets, and its black ribs are visible. Rain is falling heavily around it, with some droplets captured in mid-air, creating a sense of motion and atmosphere. The background is a blurred green, suggesting a grassy area.

Take rain, for instance. When it rains, many people take their umbrellas with them when they go outside, and for most people, a rainy day is a lousy one. But what many may not realize is that this event is unique to Earth. Aliens from far away planets may not be able to even imagine experiencing such an event. The only other world we know where it 'rains', similar to Earth, is one of Saturn's moons, Titan. It does not rain water there, however, but liquid methane. Thus, on Titan, there are methane lakes and rivers, methane clouds and rain and, who knows, maybe even some kinds of creatures living in this methane-rich environment.

A young girl with dark hair, wearing a pink headband, a pink necklace, and a pink sleeveless top, stands in the rain. She is holding a large red umbrella with a wooden handle. Her right hand is raised, palm up, as if feeling the rain. She is looking upwards and to the right with a thoughtful expression. The background is a blurred green field.

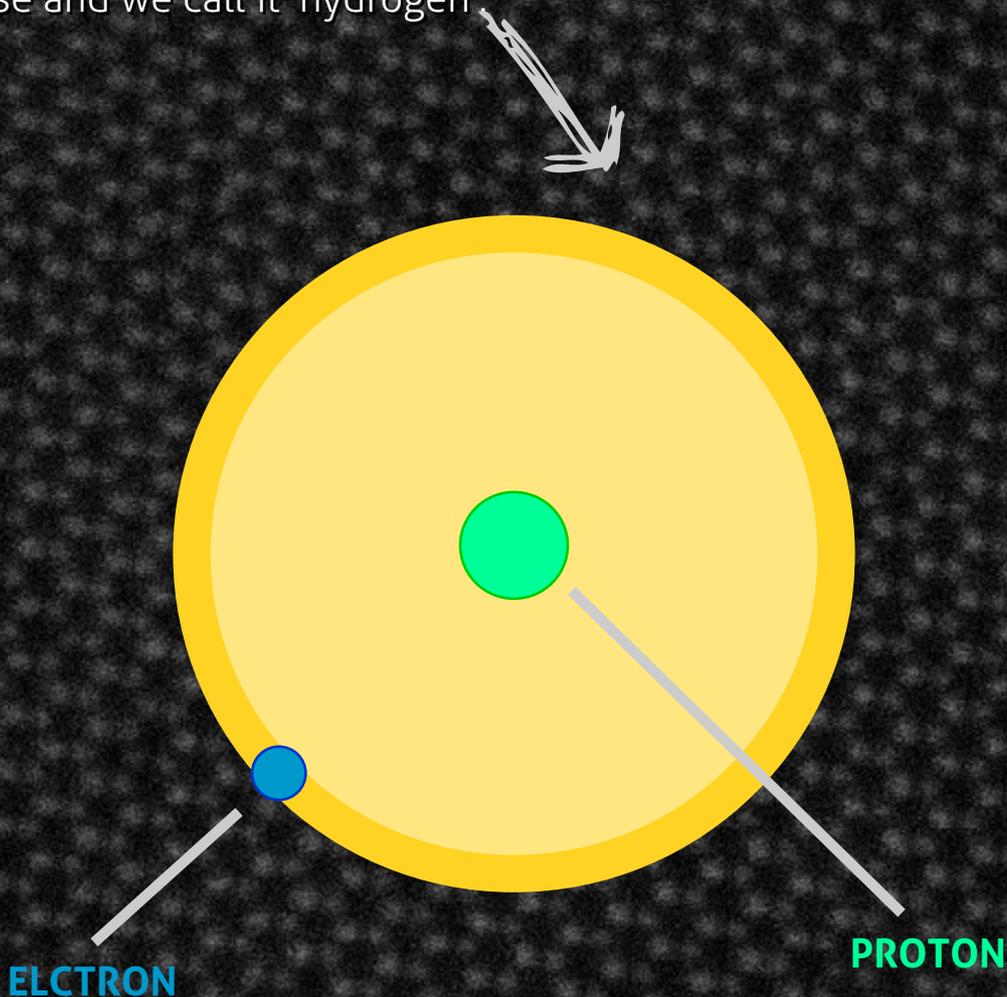
Back on Earth, in order for us to experience this 'mundane' thing such as rain, a huge amount of unique events must occur: from the Earth's position relative to the Sun and the Moon, to the many creatures on Earth and the landscapes found on this planet, and its overall temperature.

I heard many times in school how water evaporates, forms clouds, and then rains back down, but that explanation is overly simplified, as many may not realize that it's all due to structures and vibrations. We will try to explain this phenomena first, in a way that is far more explanatory. Then we'll will build upon that and show you some interesting facts behind any kind of 'event'.

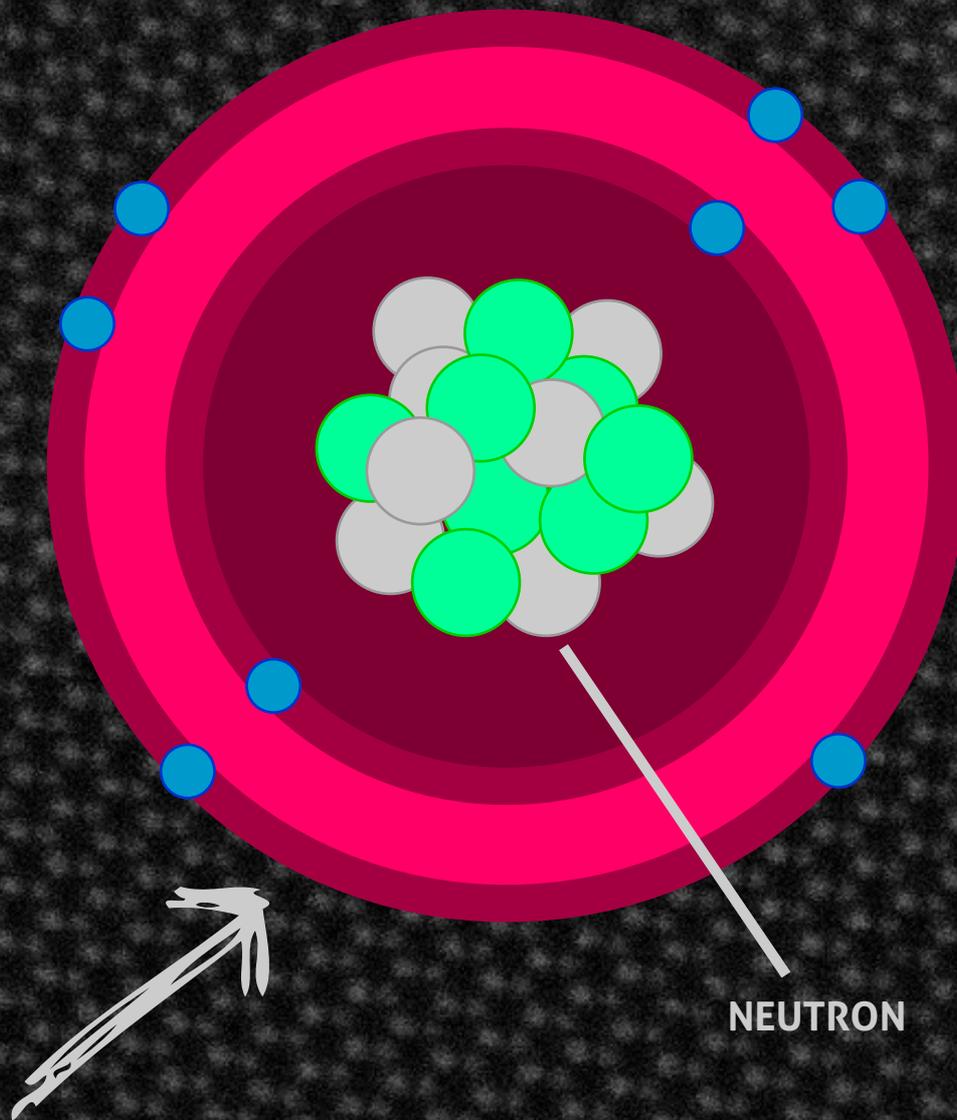
Water: rivers, oceans, snow, rain, ice, vapor, the liquid in your water cup, or in your body. We call all of these 'things' water, because everything in this world is composed of atoms, unique combinations of atoms form molecules, and molecules form the 'stuff' that we see (matter).

Atoms are very, very small 'objects' that are basically composed of 2 main parts: a center and something orbiting that center. It is similar to a solar system in a way. In the center, there are 2 important parts, a neutron and proton. For this article's purpose, we do not need to go deeper into what these protons and neutrons are, but keep in mind that the number of those 2 things in the core, and the number of things that orbit around them (electrons), create the different types of atoms that we know.

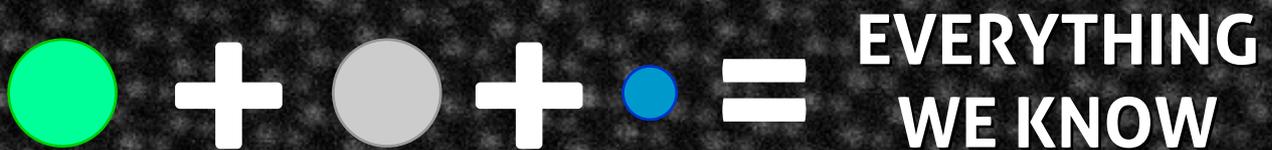
In one particular case, there is only 1 proton (no neutrons) and 1 electron. Its very simple structure is the most abundant element in the Universe and we call it 'hydrogen'



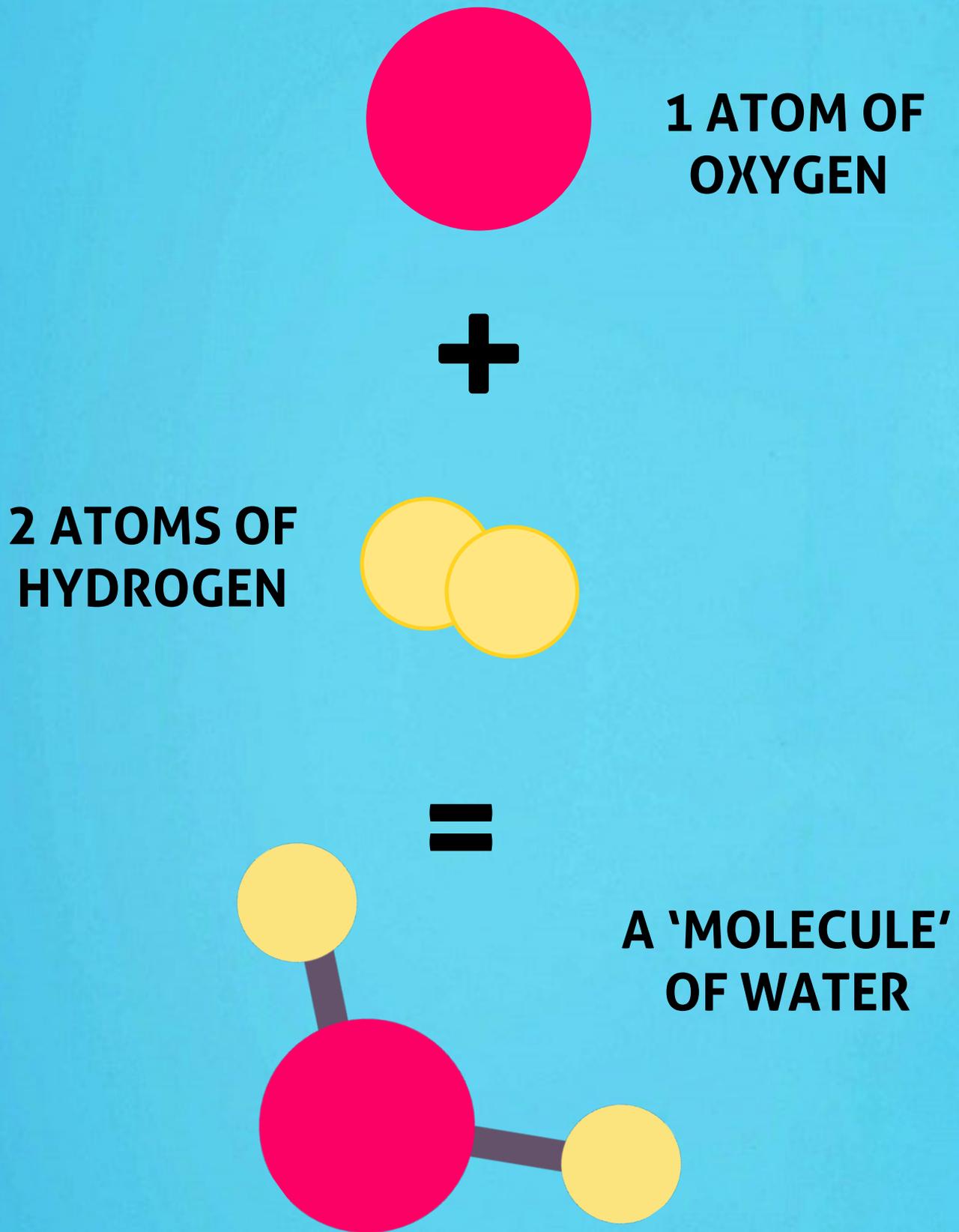
Background Image: This image from a scanning transmission electron microscope shows the individual atoms in a two-dimensional sheet of molybdenum diselenide.



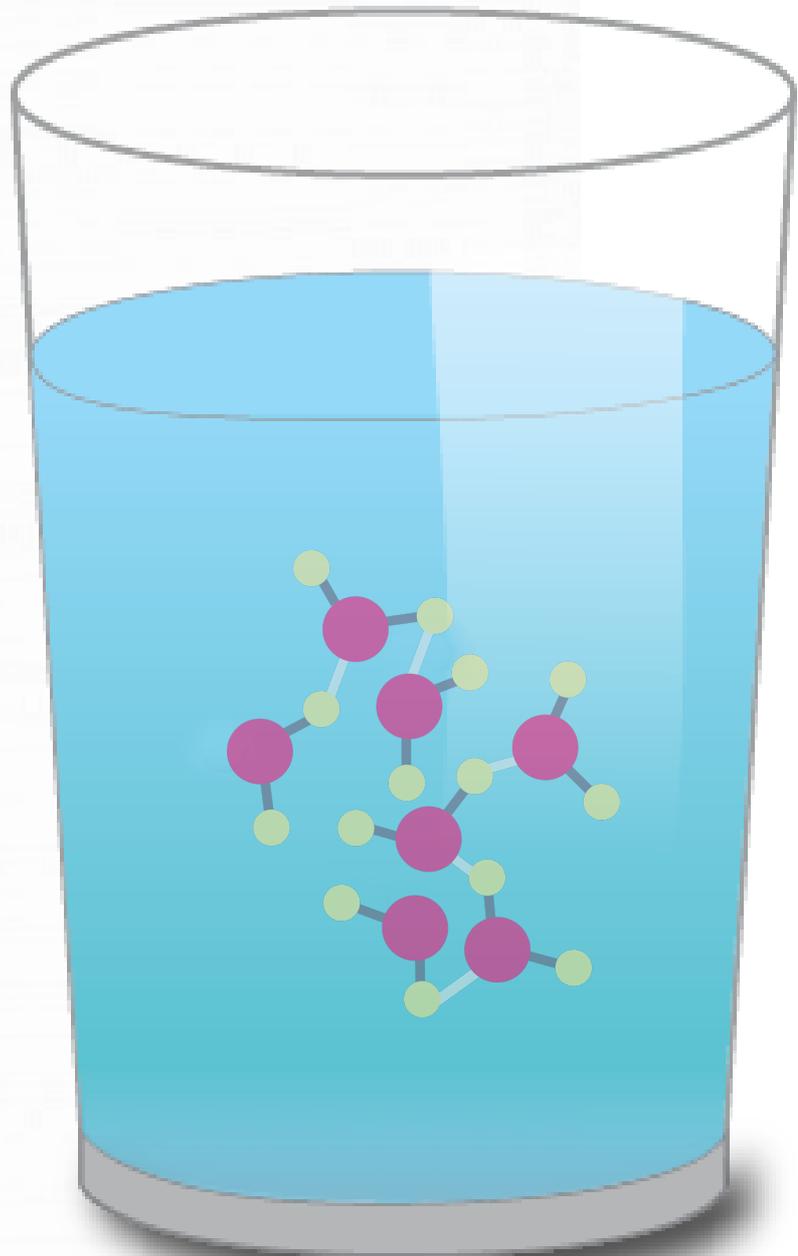
8 protons, 8 neutrons and 8 electrons form another elemental structure that we call 'oxygen'. And so on... Different combinations of these 3 things, protons, neutrons and electrons, create different 'flavors' of atoms.



The most mind blowing part of this is the way that these various flavors of atoms combine with each other, creating all the matter in the universe: mountains, guts, saliva, salt, legs, clouds, cells, chairs, rocks, mustaches, laptops... They are like lego pieces with the way they assemble, creating different molecular structures with different properties.



Thus, basically 2 types of atoms 'combine forces' to create the water molecule. Now, imagine this molecule, and multiply it by a trillion, or a quadrillion, and you get the water that we know. They are basically tiny structures that, in bulk, we interpret (see and feel) as one thing, water in this



**INDEED THERE ARE MORE
WATER MOLECULES IN A SINGLE
GLASS OF WATER THAN THERE
ARE GLASSFULS OF WATER IN
THE ENTIRE OCEAN.(SOURCE)**

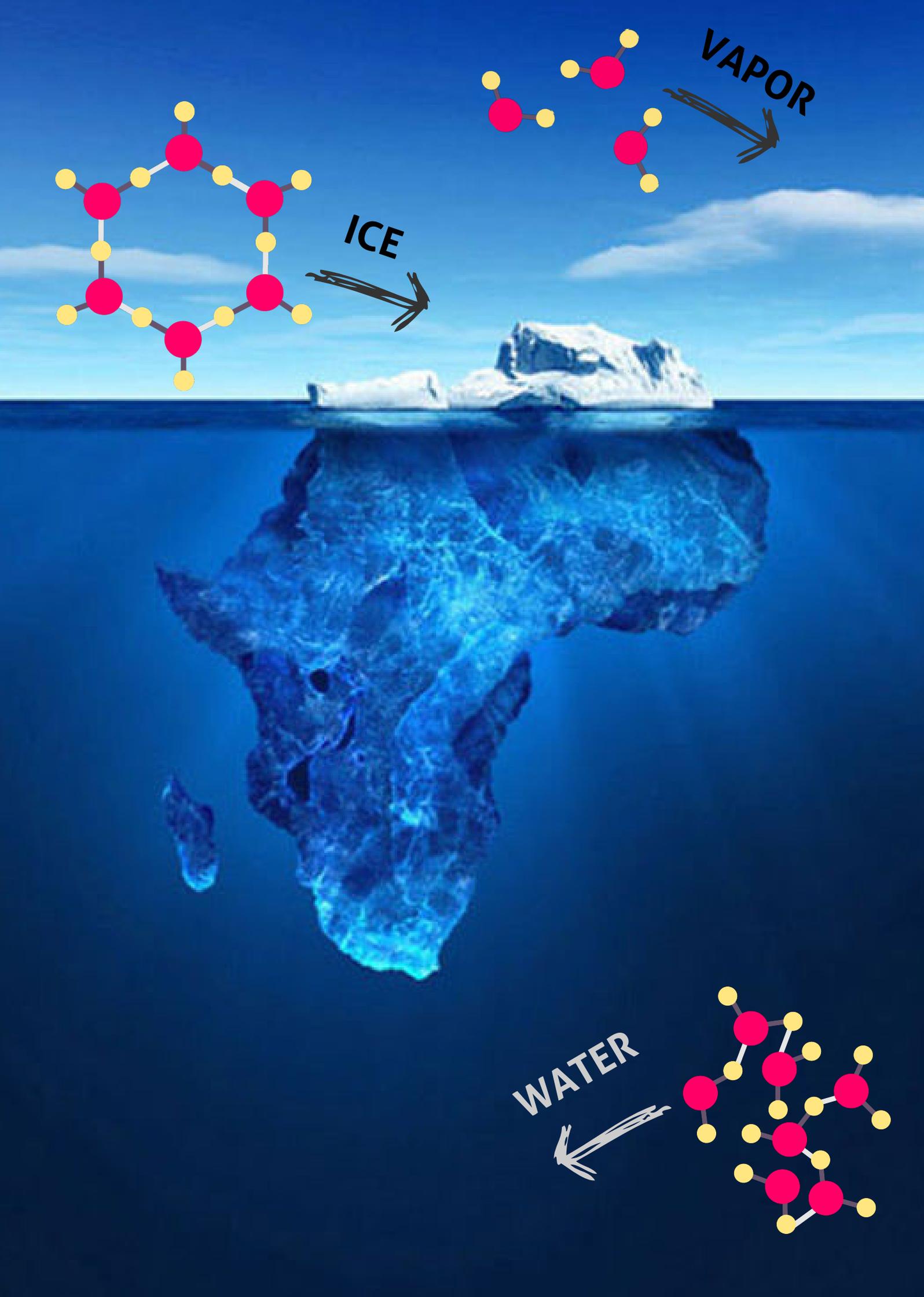
THINK ABOUT THAT!

So how can the same molecule be the building block of ice, water, or steam, when they all look and feel so different to us?

Not only is it mind blowing that that the world we know is basically formed of microscopic 'lego pieces', that assemble into different forms to create everything we know, but it's also really fascinating the way that these lego pieces vibrate to give different properties to the things we know. If water molecules vibrate within a certain range of frequencies, they form liquid water as they keep a somewhat loose bond between them (they are connected, but not very tightly). As their vibration slows down, they become more structured and form what we tend to call 'ice' (their bond is much stronger).

On the other hand, if they vibrate a lot, the bonds between these molecules of water break down and the molecules remain mainly 'alone'. Because individual molecules of water are lighter than the air around them, they rise up and we call that 'water vapor'.

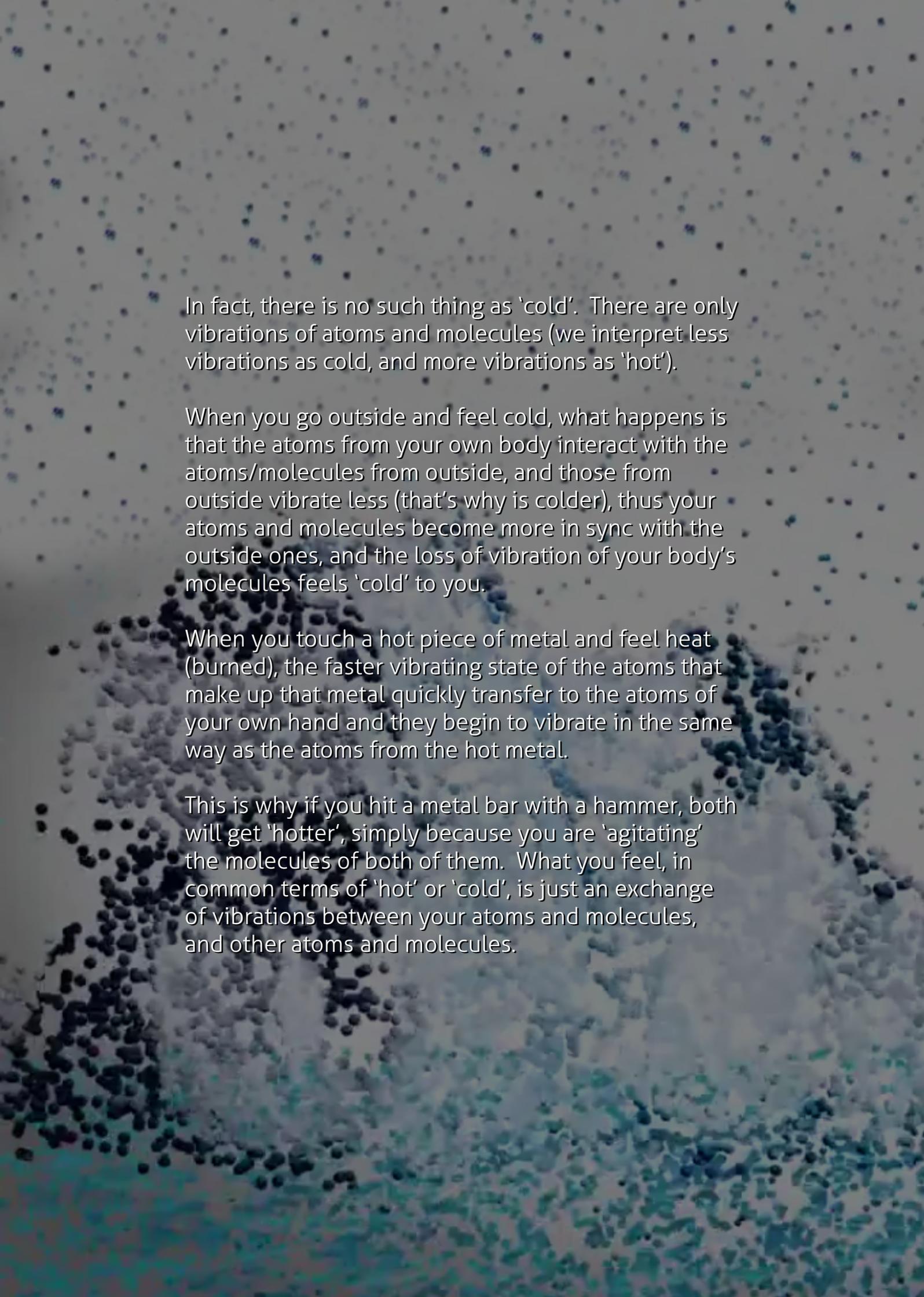
To understand this better, when you boil water, you are transferring energy to the water molecules. They eventually vibrate so much that many of them start to lose their bonds and become individual molecules, which we then see as vapor rising out of the pot. I hope you get the picture, as it is all about this 'vibration'.



VAPOR

ICE

WATER



In fact, there is no such thing as 'cold'. There are only vibrations of atoms and molecules (we interpret less vibrations as cold, and more vibrations as 'hot').

When you go outside and feel cold, what happens is that the atoms from your own body interact with the atoms/molecules from outside, and those from outside vibrate less (that's why it's colder), thus your atoms and molecules become more in sync with the outside ones, and the loss of vibration of your body's molecules feels 'cold' to you.

When you touch a hot piece of metal and feel heat (burned), the faster vibrating state of the atoms that make up that metal quickly transfer to the atoms of your own hand and they begin to vibrate in the same way as the atoms from the hot metal.

This is why if you hit a metal bar with a hammer, both will get 'hotter', simply because you are 'agitating' the molecules of both of them. What you feel, in common terms of 'hot' or 'cold', is just an exchange of vibrations between your atoms and molecules, and other atoms and molecules.

**OUTSIDE
ATOMS**



**HUMAN
ATOMS**



The background is a photograph of a bright sun over a blue ocean. Overlaid on this are several water molecules, each consisting of a red sphere (oxygen) and two white spheres (hydrogen) connected by grey lines. In the lower-left, a cluster of these molecules is shown. An arrow points from this cluster towards the upper-right, where the molecules are more widely spaced. The text 'LIQUID TO VAPOR' is centered in the middle, and 'VIBRATING A LOT' is positioned above the upper-right cluster of molecules.

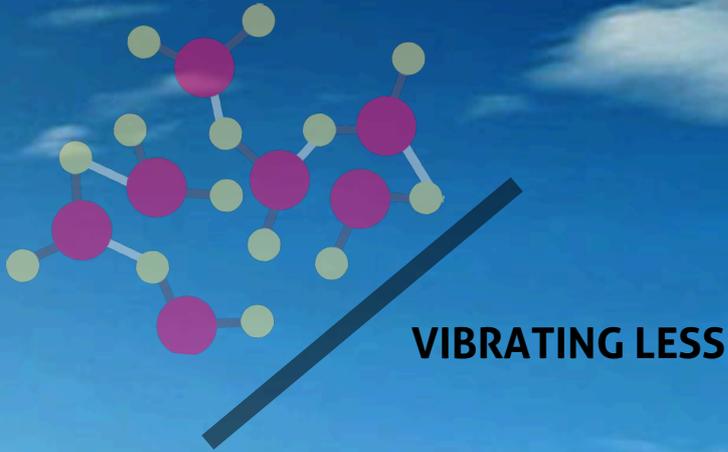
VIBRATING A LOT

**LIQUID TO
VAPOR**

With all of that in mind: when the Sun's rays or any other kind of heat source (energy) transfers into water, it makes the water molecules vibrate more and more, eventually losing their bonds and rising up into the atmosphere. This is how clouds are formed.

These molecules then react to the colder environment up there and start to vibrate less, thus allowing new bonds to form between them. As millions of such bonds happen around the same place, a rain drop begins to form, and once that raindrop becomes heavy enough, it falls back to the Earth due to gravity.

VAPOR TO LIQUID



Thus, the difference between liquid water, ice and vapor is all in how strong (if at all) the water molecules bond with each other, and this bond is dependent of the vibration state of the molecules.(source)

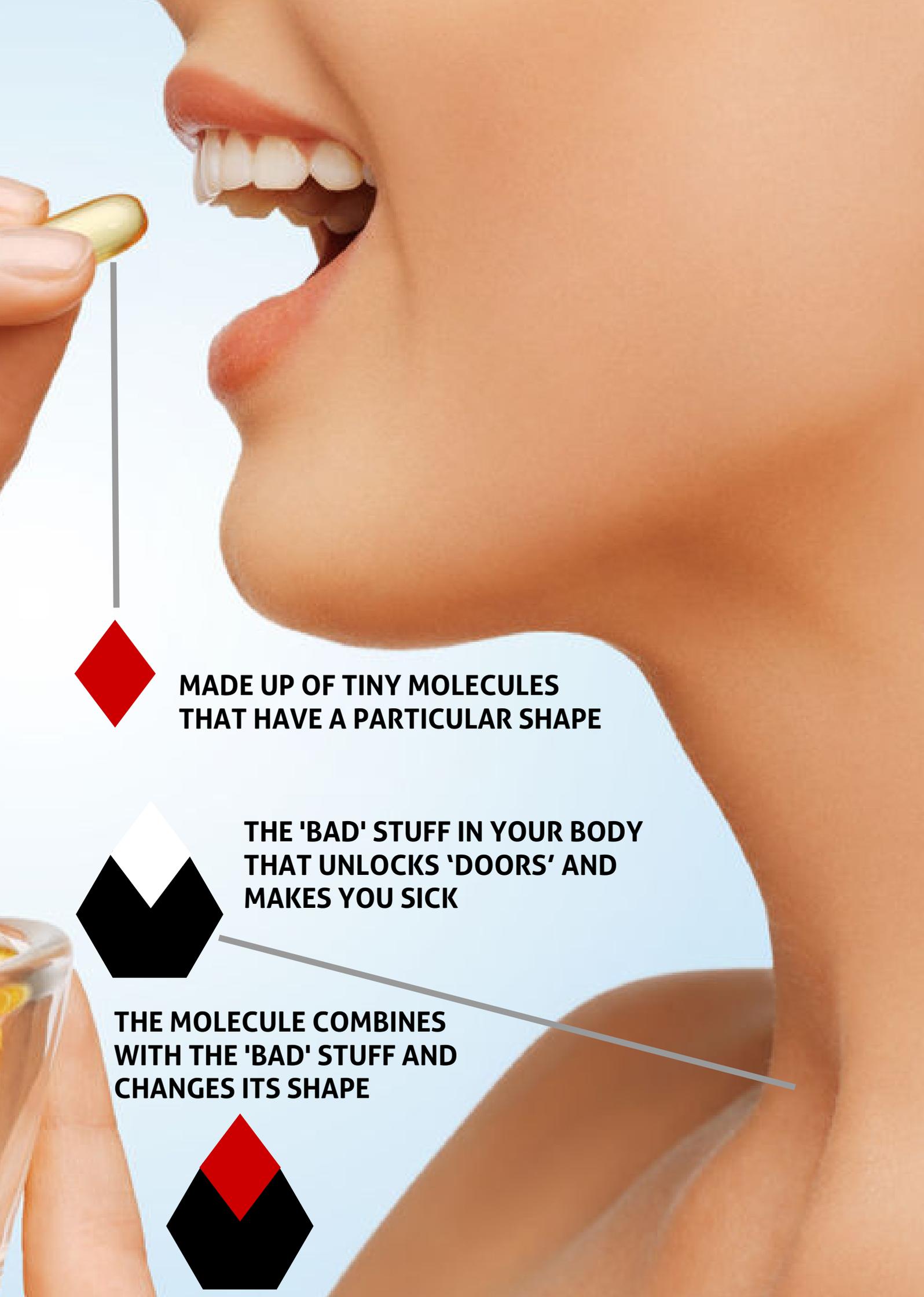
The seasons that we experience here on Earth are basically a bunch of these tiny reactions of the lego-like atoms and molecules that bind and vibrate, while the 'rhythms' and shapes of their interactions create not only events here on Earth, but throughout the entire known universe.

The shape of things, especially molecules, is so important that even when you take medicine, you are basically ingesting specific molecular forms (atoms clustered together in a particular way) that are specifically designed (shaped) to merge/combine with other 'things' in your body, just like lego pieces.

The 'bad' stuff in your body (viruses, unhealthy bacteria, etc.) are basically like keys that can open 'doors' in your body and trigger harmful effects for you, while medicines are basically specifically designed shapes (molecules of atoms) that will bond to these keys, making them no longer able to access those 'doors'.

**ISN'T IT
FASCINATING
THAT IT'S
ALL ABOUT
SHAPES AND
VIBRATIONS?**





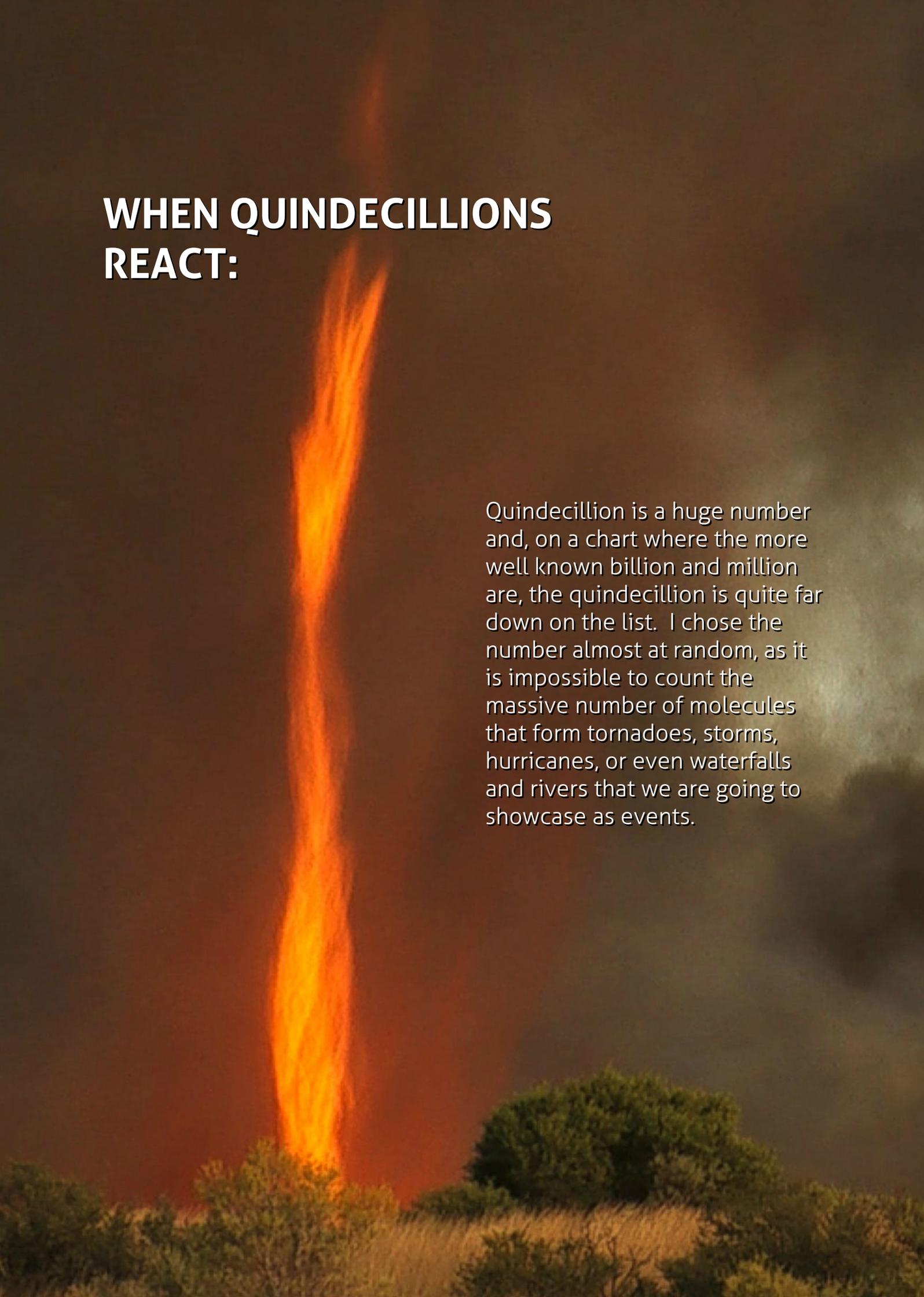
**MADE UP OF TINY MOLECULES
THAT HAVE A PARTICULAR SHAPE**

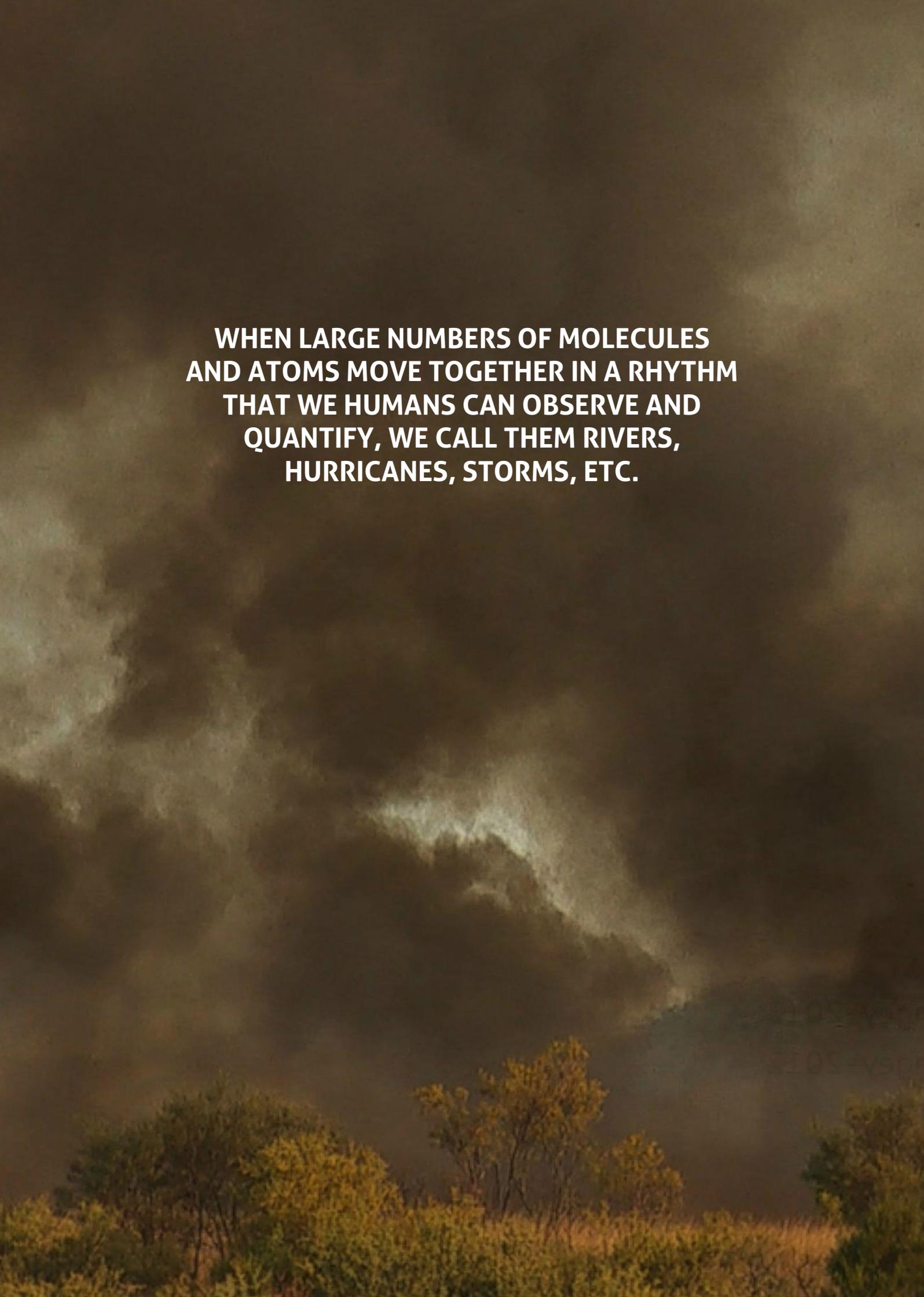
**THE 'BAD' STUFF IN YOUR BODY
THAT UNLOCKS 'DOORS' AND
MAKES YOU SICK**

**THE MOLECULE COMBINES
WITH THE 'BAD' STUFF AND
CHANGES ITS SHAPE**

WHEN QUINDECILLIONS REACT:

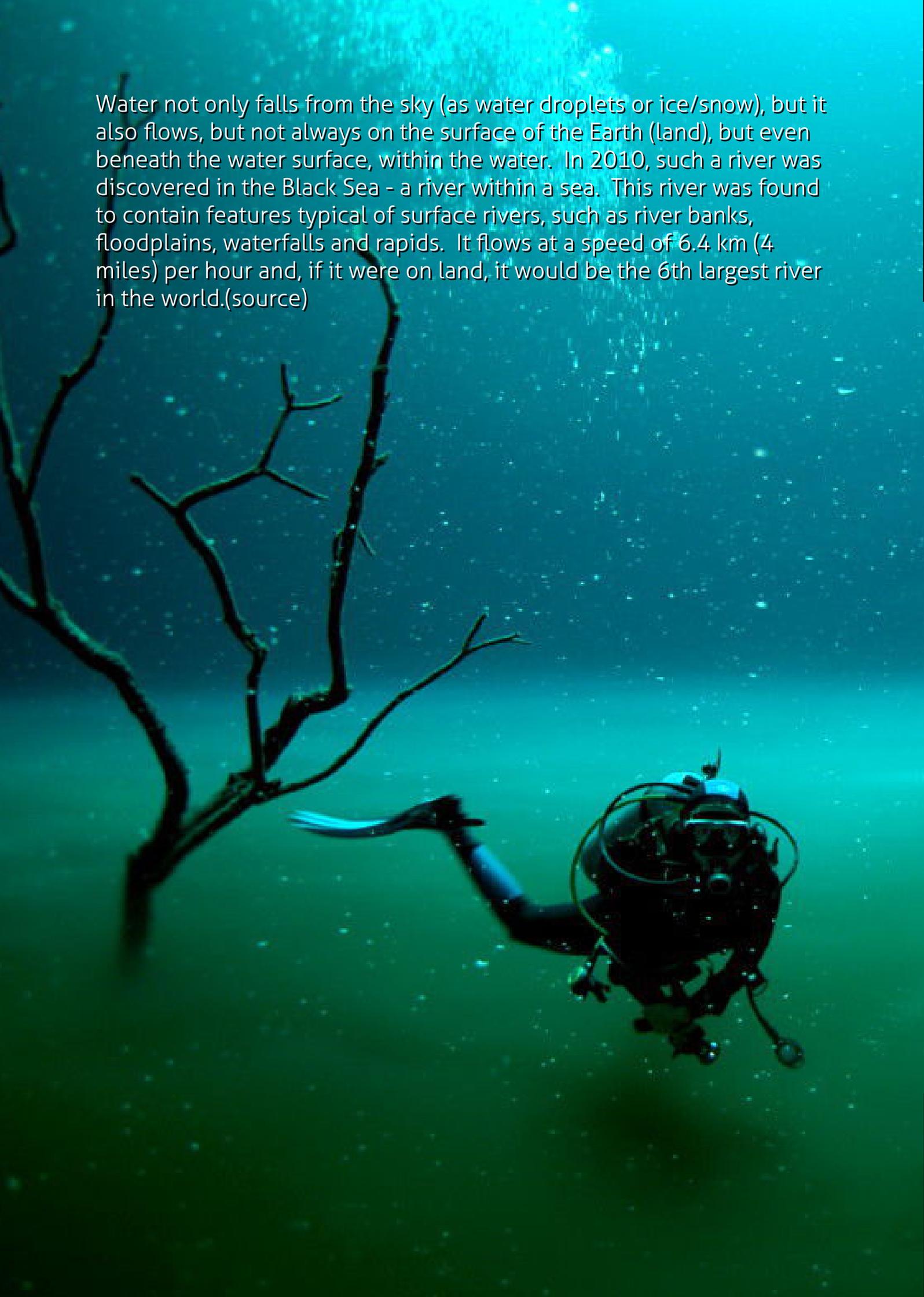
Quindecillion is a huge number and, on a chart where the more well known billion and million are, the quindecillion is quite far down on the list. I chose the number almost at random, as it is impossible to count the massive number of molecules that form tornadoes, storms, hurricanes, or even waterfalls and rivers that we are going to showcase as events.

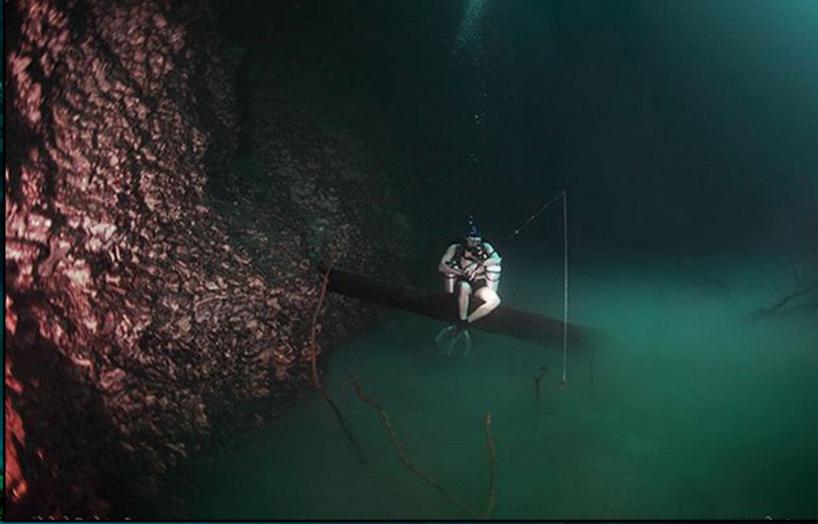




**WHEN LARGE NUMBERS OF MOLECULES
AND ATOMS MOVE TOGETHER IN A RHYTHM
THAT WE HUMANS CAN OBSERVE AND
QUANTIFY, WE CALL THEM RIVERS,
HURRICANES, STORMS, ETC.**

Water not only falls from the sky (as water droplets or ice/snow), but it also flows, but not always on the surface of the Earth (land), but even beneath the water surface, within the water. In 2010, such a river was discovered in the Black Sea - a river within a sea. This river was found to contain features typical of surface rivers, such as river banks, floodplains, waterfalls and rapids. It flows at a speed of 6.4 km (4 miles) per hour and, if it were on land, it would be the 6th largest river in the world.(source)





Photos: Cenote Angelita - A similar underwater river, or 'water current'

An aerial photograph of a large, powerful underwater vortex in the ocean. The water is a deep teal color, and the vortex is characterized by a central point where the water converges, surrounded by concentric, swirling currents. The water surface shows some white foam and ripples, indicating the intensity of the flow. The overall scene is dynamic and captures the raw power of the ocean's hidden forces.

Vortexes, like tornadoes or hurricanes, do not only happen on land, but as in the case of the underwater river, they happen beneath the water as well. A maelstrom is a powerful vortex that is created by water currents, tsunamis or sinkholes.

This video shows a giant maelstrom that formed after the 2011 Japan tsunami.

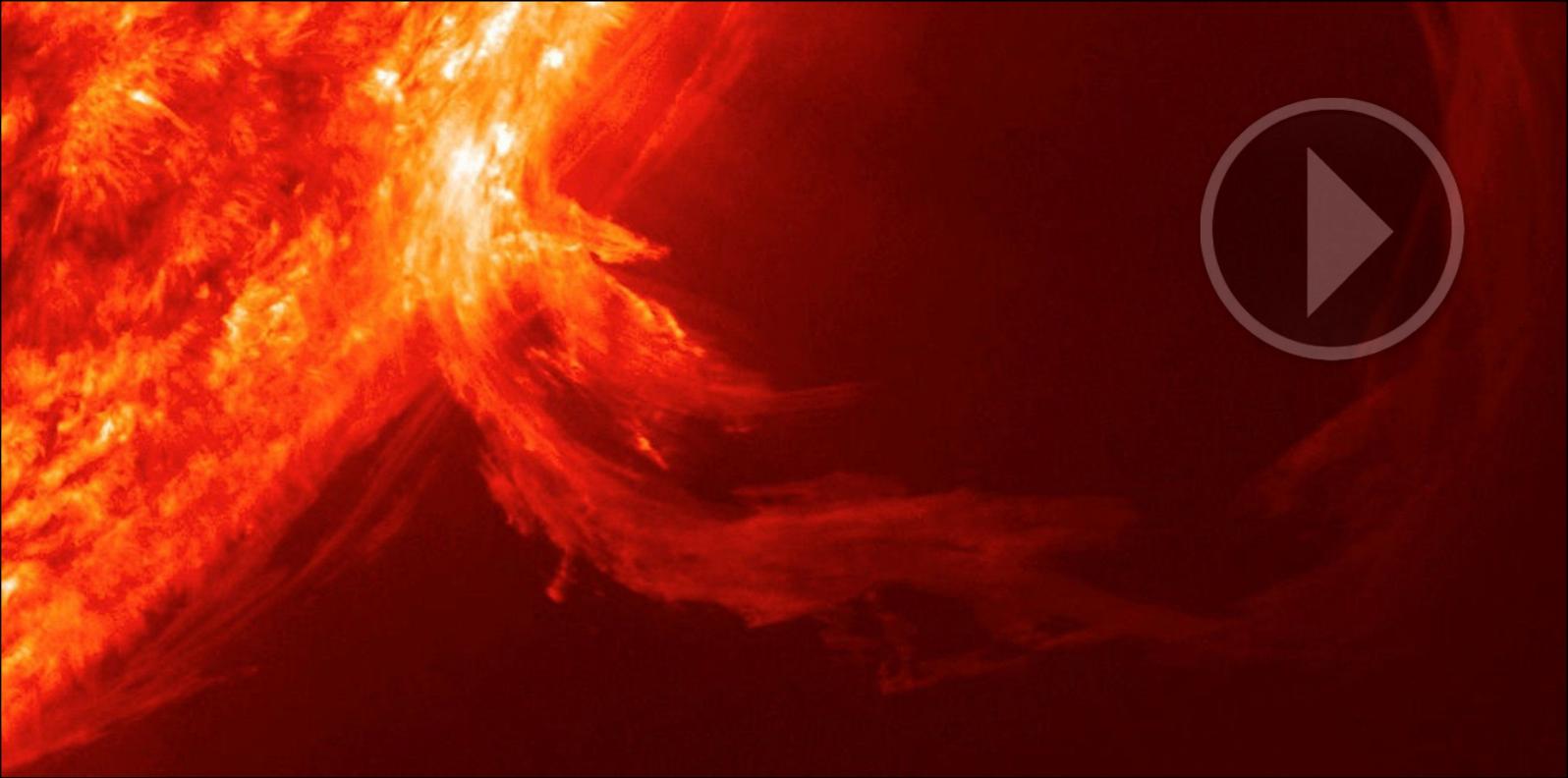


And this video showcases maelstroms that are caused by water currents.

A storm can also be dry - made out of dust and/or sand. These storms can grow up to 1.6 km (0.99 miles) high; so massive that they can be seen from space. Dust storms are essential for rainforests like the Amazon in delivering nutrients. Just imagine that dust from Sahara travels all the way to the Amazon forest.(source)







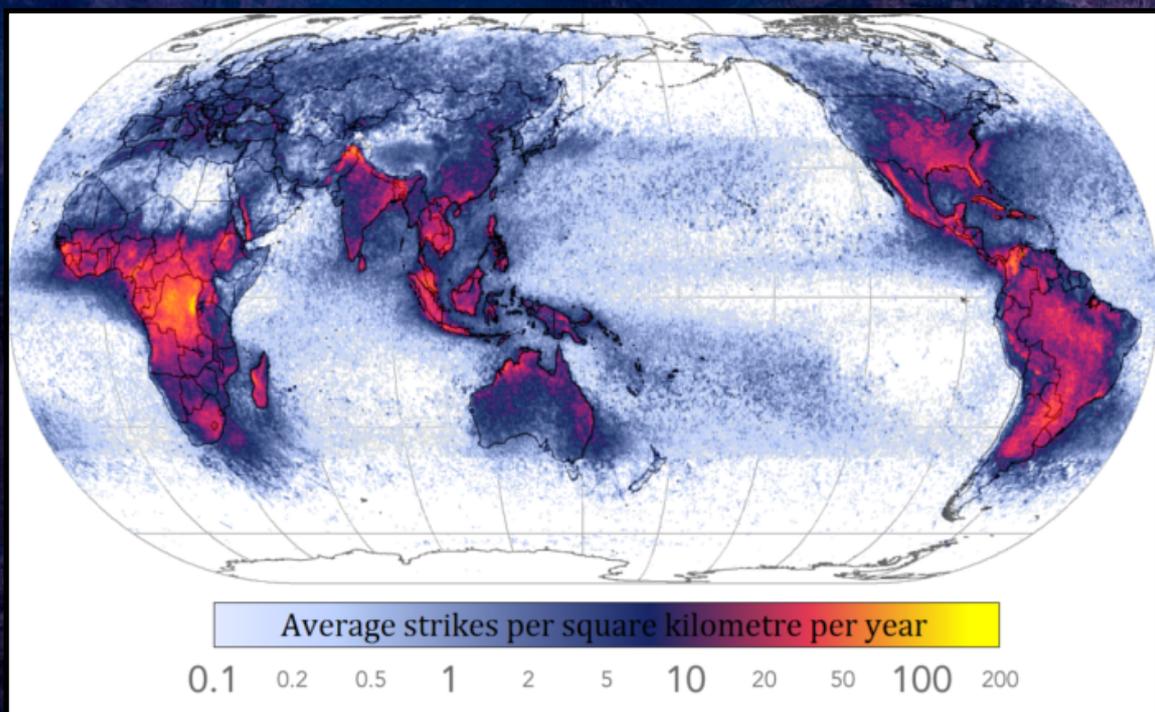
Also, the effects of a storm on the surface of the Sun can be experienced here on Earth, when the storm's wind (the solar wind) reaches us. Tiny particles (mainly protons and electrons) interact with the Earth's atmosphere and create (for us) surreal lights in the sky.(source)







Sometimes within 'normal' storms, dust storms, forest fires, tornadoes, or volcanic eruptions, the quindecillion of tiny particles get 'overcharged' by friction and produce what we see as lightning. On average, 40-50 lightning events happen every second around the planet's surface. However the strikes are not equally distributed, as seen on this map.





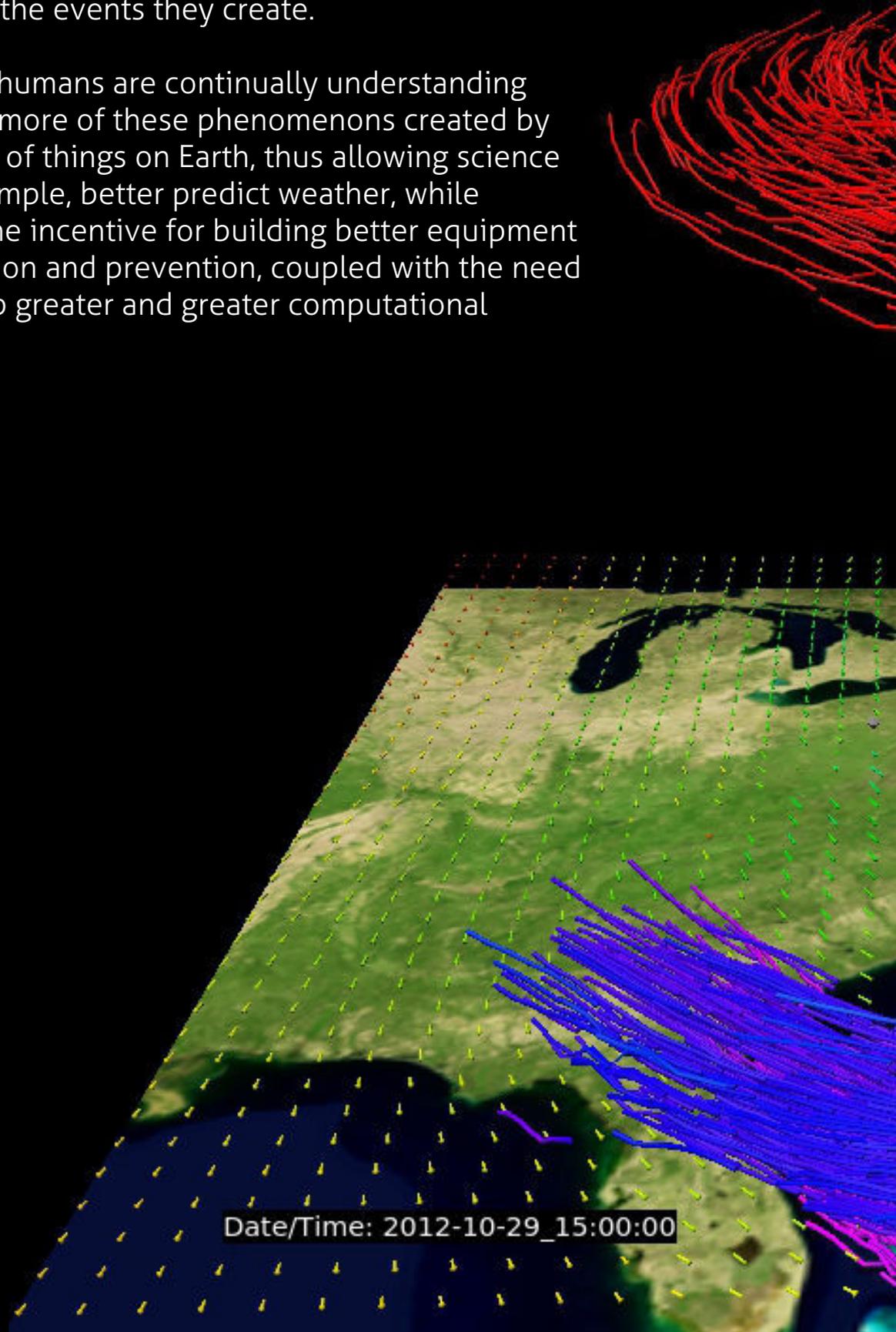
Lightning is 5 times hotter than the surface of the Sun and, 'ironically' in a way, it's ultimately powered by the Sun's energy, as the Sun provides energy to the Earth (it makes the Earth's atoms and molecules vibrate).(source 1, 2)

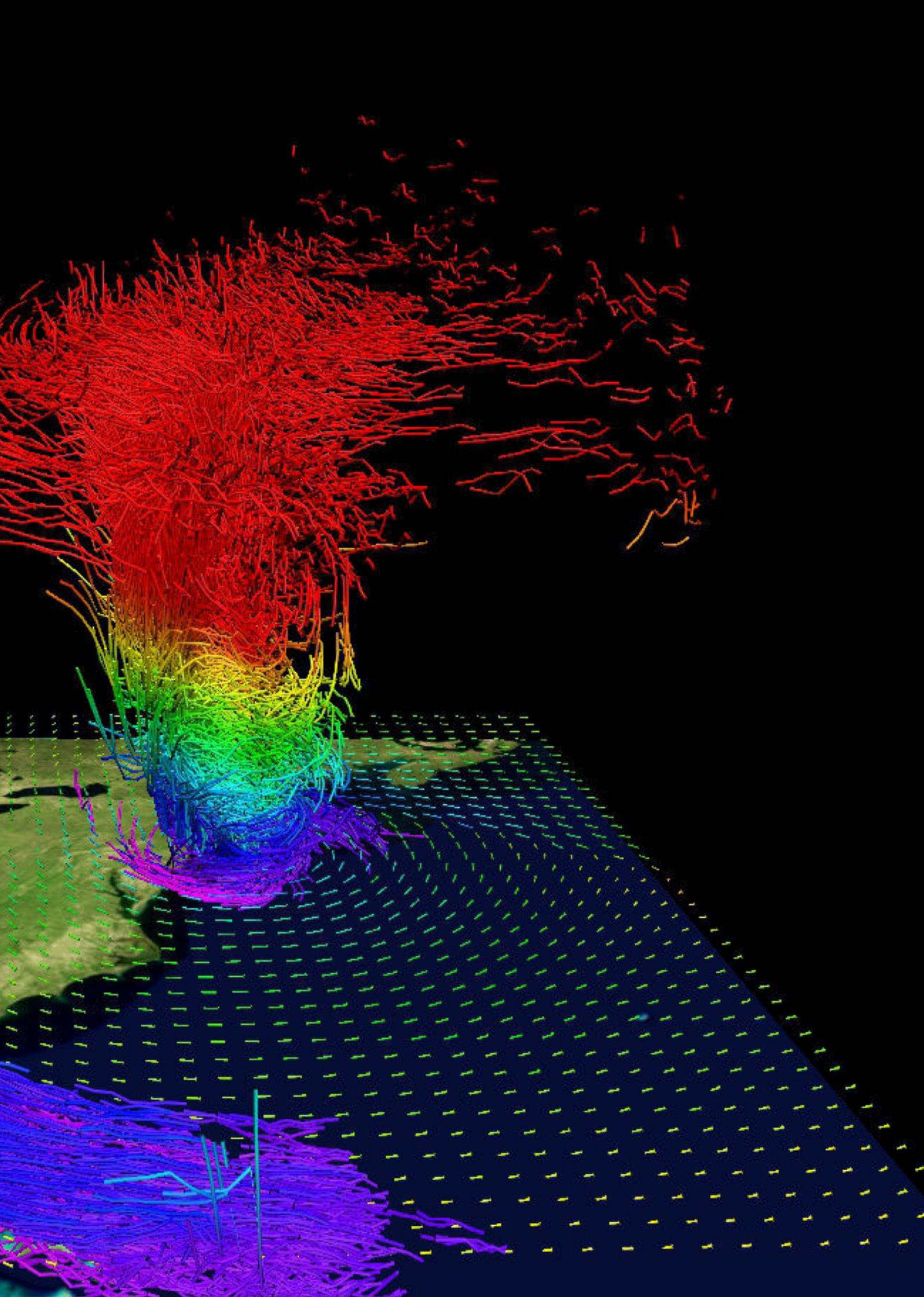
But lightning also has multiple types. There can be downward strikes, horizontal strikes, upward strikes, and even electrical discharges in the form of a sphere, such a rare phenomenon that the first and only video capturing such a strike was recorded by mistake in 2012. This 'lightning ball' was 5 meters (16.4 feet) wide and traveled 15 meters (50 feet) horizontally in 1.5 seconds.(source)



Understanding quidecillions of reactions requires the most powerful computers on Earth, as the reactions are so dynamic and innumerable that it seems impossible to ever understand, with great precision, the events they create.

However, humans are continually understanding more and more of these phenomena created by the tiniest of things on Earth, thus allowing science to, for example, better predict weather, while pushing the incentive for building better equipment for detection and prevention, coupled with the need to develop greater and greater computational power.





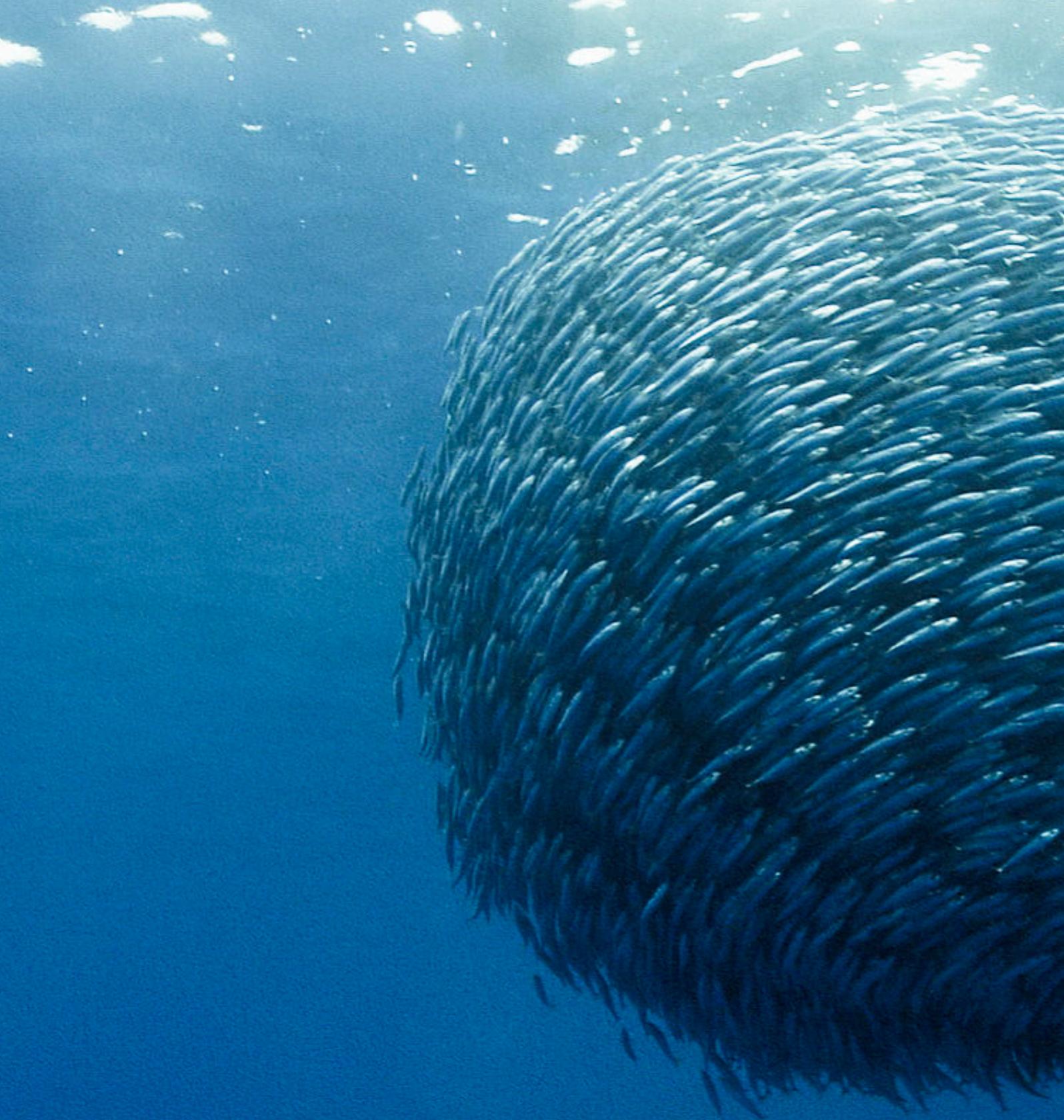
**WHEN MANY, MILLIONS, AND
BILLIONS REACT:**





From those tiny atoms and molecules, we'll now migrate to large creatures and some of the most amazing of their total-environment responses. When it comes to mass migrations of creatures, one word has been used to describe these events more than any other: instinct.

Unfortunately, the word instinct tells you nothing about the mechanisms behind these migrations. It needs to be understood that when it comes to such migrations, they are the result of many series of events and environmental reactions that make it extremely hard to properly understand them. That is not to say that we should use a word without meaning to replace the unknown, but rather to seek more complete understanding.



This is a living sphere of sardines. Banks of sardines can grow up to 7 km (4.3 miles) long, 1.5 km (0.8 miles) wide and 30 metres (98 feet) deep. Billions of them take months to migrate over 1000 km (620 miles), every year, driven, it seems, by the water's temperature, in what results in the greatest 'feast' on the planet.







Due to the presence of billions of sardines in one place, thousands of dolphins, hundreds of sharks, many whales and seals, and even birds flocking to enter the water like rockets from the sky, all converge in a creature feeding frenzy.(source)



Sea turtles annually migrate for hundreds or thousands of km/miles and eventually return to the same location where they were born to lay their eggs, which is amazing. It is thought that the Earth's magnetic field helps the turtles return to the same place where they started as 'babies'.





Another interesting aspect is that after they hatch, when they start their migration, it has been shown that the slope of the beach, the white crests of the waves, and the natural light of the ocean's horizon makes them go towards the water, but when they hatch on a beach near a city at night, the turtles often go towards the city, because they are attracted to the lights. Thus, a turtle does not 'know' that it needs to start this magnificent journey through the ocean. It is just reacting to existing stimuli.



An underwater photograph of a humpback whale swimming in deep blue water. The whale is the central focus, moving from the left towards the right. Its large, dark body and long, curved tail are clearly visible. The water is a deep, clear blue, with some ripples on the surface at the top. In the bottom right corner, there is a circular icon with a white play button symbol inside, indicating that this is a video frame.

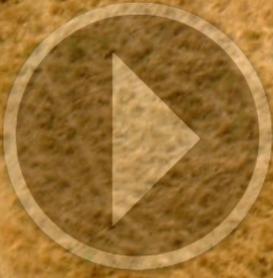
Humpback whales migrate over half of the circumference of the Earth (25 000 km - or around 15 500 miles), each year, influenced by climate changes, water temperature, oceanic depth, salinity, topography of the seafloor, and the biggest one, abundance of food. Their speed is around 4.8 km (3 miles) per hour, so imagine yourself, traveling more than half the globe, on foot, every year.



Monarch butterflies undergo one of the most amazing migrations on the planet. Although they are tiny, they travel thousands of km (or miles). The way they do it is quite unique, because no individual butterfly can possibly complete the journey. Instead, millions of them travel for a certain distance, lay eggs, and then die, while their baby butterflies then continue the journey.

Four generations of these butterflies travel almost the entire North America back and forth each year. It's unclear exactly what drives this migration, but hypotheses suggest that the butterflies may be influenced by the Sun, certain chemicals, landscapes, or Earth's magnetic field.





From insects to wildebeests, enormous migrations occur all over the earth, triggered by the tiny particles that create the atmosphere and various scents, dictate temperature, and more.

WILDEBEEST MIGRATION



Other characteristics of creature kingdom events include the various behaviors that they exhibit and the amazing transformations that some of them experience.

KILLER ANTS



Another migration event, similar to the monarch butterflies, happens with dragonflies, where again, it takes four generations for them to travel across many thousands of km (miles) each year. A very interesting aspect of dragonflies is that most of their life is spent in water, in a fish-like state, where they hunt other creatures using their extendable jaws. Some can even hunt on land.



After five years or so, they emerge from the water, transforming into a flying insect.



One question to consider might be: How can the neurons that act as this creature's 'brain' adapt so readily to such different environments and movements?



Does this look like a fly to you? This bug lives beneath the water and similar to the dragonfly, it transform into a fly after 1-3 years. In fact, billions of such flies emerge from the water almost at once.



The fantastic thing about them is that they only live for a day or so. They don't have a functional stomach, so they basically hatch, mate, and then die once they run out of energy.



EVERYTHING IS ENERGY FLOW:



If you think about that fly, it died because it had no energy. Well, how true is that? If you burn that fly, it will burn, meaning it will emanate energy. Even the dead body of a fly still contains energy potential (almost the same amount as a living one), but just not enough to keep it alive. Once you burn that fly, it does not mean that you have eliminated the energy, but instead have distributed it. Meaning, the atoms that were once that fly, can become part of your food, or atoms of other creatures, or mountains, water, or other planets or stars.

What is amazing about the world we live in is that there is the same amount of energy in the Universe as there was 100 million years ago, or at the beginning of the universe, and it will always remain the same.

When you plug in an electric toy, or run it on batteries, it 'works' because it has an energy source, and thus an energy flow powering its components. The same thing occurs with water movement, storms, butterflies, wildebeests, and indeed, us.

The Sun's rays strike the Earth and plants convert it into chemicals (stored energy). Plants get consumed by animals and provide energy and tissue (again stored energy) for the animal. We then eat both plants and animals to get the energy needed to pedal our bikes up a hill. Thus, that energy moved from the Sun, to the plant, through the animal, into you and then became available to the bike's mechanics. It was essentially dispersed into organic matter, heat and movement (all of them, as the movement of atoms).

**SO THAT'S HOW VARIOUS EVENTS TAKE PLACE
HERE, ON EARTH, AS WELL AS ANYWHERE IN
THE UNIVERSE.**

The next time that it rains, you see other creatures, you feel warm or cold, or even just think about yourself, remember that we are all made up of lego-like pieces, through which energy flows and animates. In that sense, we are certainly all one, since, in that sense, we are all energy.

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