



How are you space? What's up with you?
Go to pages 10 and 11



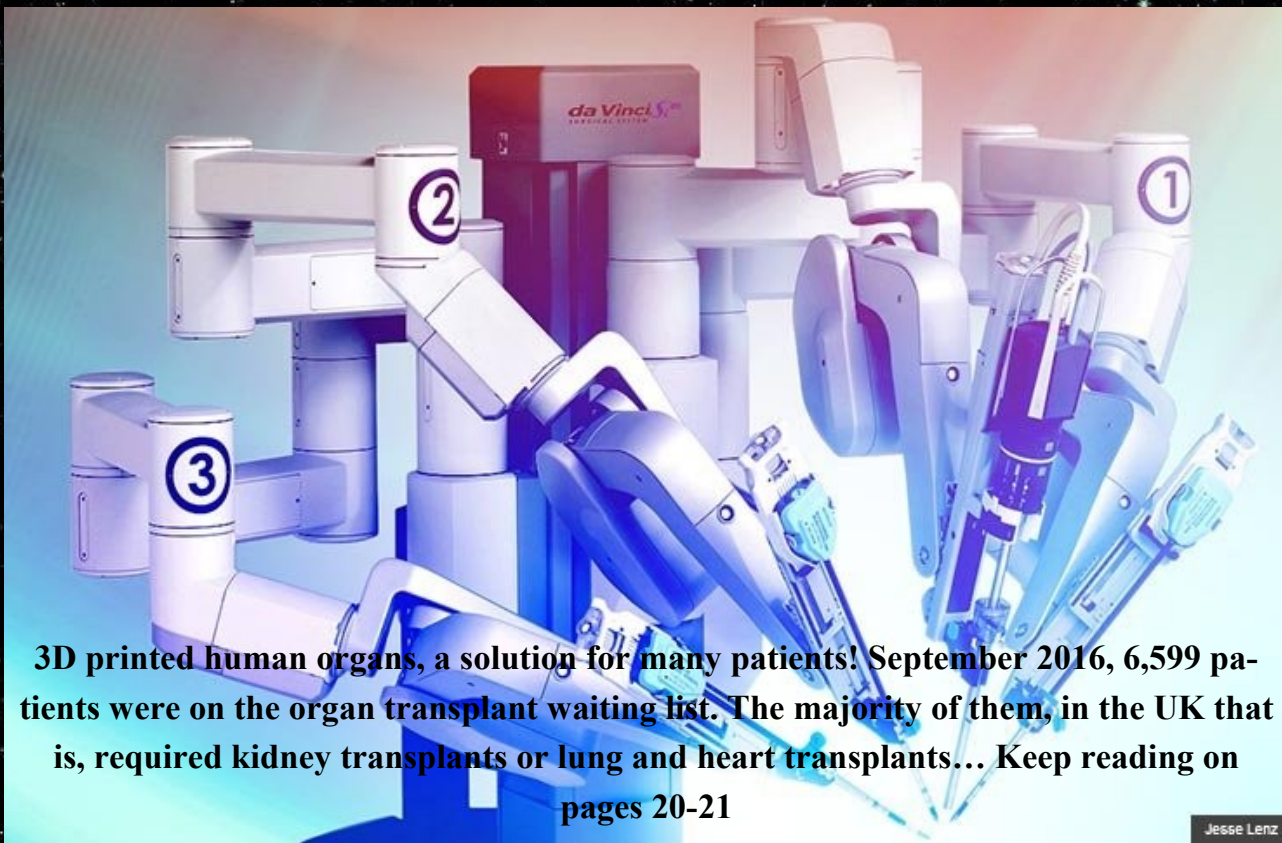
Do you think Jurassic Park is possible in real life?
Go to page 22

Inside, a special section about medicine!

Joliot Curiosity

Joliot Curiosity 2020

THE MEDICINE OF THE FUTURE



3D printed human organs, a solution for many patients! September 2016, 6,599 patients were on the organ transplant waiting list. The majority of them, in the UK that is, required kidney transplants or lung and heart transplants... Keep reading on pages 20-21

Jesse Lenz

A LITTLE PREVIEW OF WHAT YOU CAN FIND IN THIS MAGAZINE

We talk about artificial intelligence!!! Let's jump to 2050!!!

It is a project of A.I., a kind of *G...Assistant* but way more developed. We suppose that in 30 years *G... Duplex* (or another service) will be part of our daily life. And we suppose it will be sufficiently developed to talk normally to humans.

Pages 6 and 7



Did you know that? Animals have powers!

Some of them can do incredible things!!



Pages 24 and 25

Welcome to our magazine !

Do you know what the Higgs Boson is? Or what astronauts discovered recently? Are you interested in the infinitely small or in biomimicry? We have what you need! If you go through these pages you can find many topics that can be interesting for you, such as classical medicine or that of the future, or why dinosaurs disappeared. If you are interested in artificial intelligence, you may wonder if robots can destroy us. Let's hope not! But maybe the danger will come from animals. Do you know they have powers?

However in this magazine you can find useful topics like the dangers of drugs and alcohol, or the effects of the pollution on our body.

In short, each of you can find in this magazine something that may be of interest to you, read it and let us know what you think.

THE DEATH OF EARTH BY GRETA

Greta Thunberg was born on January 3rd, 2003 in Stockholm, she is 16 years old. She became famous at the age of 12 on *Instagram*. She received many prizes, like the "Prize of Liberty" in 2019, or the "Right Livelihood Awards" (an alternative to the Nobel Prize). In 2019, she was named the personality of the year by the magazine *TIME*. She leads a fight to save our planet from global warming. She said: *"I will never understand how they can sort of stem interest above our lives, above the planet's future and our future"*.

Greta stopped traveling by plane to limit her carbon footprint and her impact on the climate. Social media accounts amplified her cause. Her most famous speech was delivered on September 23, 2019: *"How dare are you?"* In this speech, she denounced the inactions of the politicians in front of the Earth's degradation.

She stopped to go to school on Fridays because of her fight for the climate. This is her "Strike for climate" action.



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THE EARTH OVERSHOOT DAY

What is the Earth overshoot day?

The **Earth overshoot day** corresponds to the date of the year, calculated by the American NGO *Global Footprint Network*, from which humanity is supposed to have consumed all the resources that the planet is able to regenerate in a year.

To determine the date of **Earth Overshoot Day** for each year, *Global Footprint Network* calculates the number of days of that year that Earth's biocapacity suffices to provide for humanity's Ecological Footprint. The remainder of the year corresponds to global overshoot. **Earth Overshoot Day** is computed by dividing the planet's biocapacity (the amount of ecological resources Earth is able to generate that year) by humanity's Ecological Footprint (humanity's demand for that year) and multiplying by 365 (the number of days in a year): **Planet's Biocapacity/Humanity's Ecological Footprint) x 365 = Earth Overshoot Day**

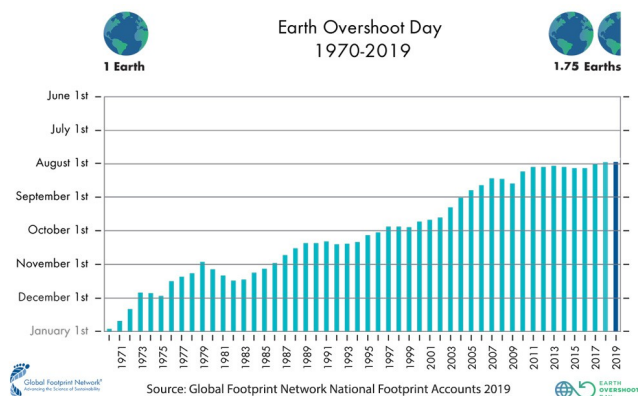
Origin of the Earth overshoot day :

The Earth Overshoot Day was first conceived by Andrew Simms (picture) for the UK think tank *New Economics Foundation*, which partnered with *Global Footprint Network* in 2006 to launch the first global Earth Overshoot Day campaign. At that time, Earth Overshoot Day fell in October.



Evolution of the Earth Overshoot day

We observe that between 1970 and 2019 it decreased by almost 5 months which represents a huge acceleration and shows the far too sudden increase in activity...



What is the goal of the Earth overshoot day?

The Earth overshoot day was created with the aim of showing each year the progress of human consumption and especially to denounce overconsumption and encourage countries to slow down their consumptions of energy and natural resources.

How many countries are required to meet the demand of its citizens...



This diagram shows how many countries are required to meet the demand of citizens. For example, in France, we need the natural capacities of 2 countries.

BLACK HOLES AND NOW BLACK BEACHES?

We assume that you have heard about black holes, but did you know that they are also black beaches now? Because of supertankers which sail around oceans and seas, there is always a risk of oil spill nowadays. And that is exactly what happened on the Brazilian beaches on August 30, 2019.

These last few months, Brazilians worked as hard as they could to save their loved beaches which were quite damaged because of a recent oil spill. According to the many speeches of the government members, no one knows where the oil comes from, even if, without any actual proofs, the President and his Prime Minister suspected a criminal act, perhaps from the neighbor country, Venezuela. Actually, more than 100 tons of crude oil spread along the coast of nine north-east states of Brazil and polluted some of the most touristic beaches in this country. And during these months, most of the inhabitants of Brazil worked together, created associations, and organized their time. These people washed up their beaches and tried as hard as they could to save whatever needed to be. And they did it even without any help of the government, that was strongly criticized for its inaction and for the crisis that they created without acting enough when their population needed them. Even a local football team helped the volunteers and came to their matches with the hands full of dirt, sand and black oil after spending the entire morning cleaning up the coast.

Photography of one of the Brazilian beaches after the oil spill



Photograph of a sea turtle killed by the crude

<https://www.ecowatch.com/brazil-oil-spill-2640663030.html>

But human life was not the only one to be impacted by the oil spill. All the Brazilian ecosystem was polluted by this catastrophe and suffered heavy damage. The experts are all agreeing to say that this crisis could be the worst disaster for the region's coral reefs. A lot of animals have been touched by the oil spill too, and already fifteen sea turtles, two seabirds and one fish have been found dead following the oil spill and over 800 baby turtles were kept from going into the sea, for their own safety and the safety of their species. It was a real environment emergency declared by the government and even with their (late) actions, the affected area was so huge that they could not protect every part. The problem with this oil spill (besides all the problems that we have mentioned before) is that it is way more challenging than the "normal" oil spill because instead of floating on the surface, as the oil usually does, the crude stays at the bottom of the sea and only appears when it is washed up on the shore so it is hard to detect it, and all the means that are usually used do not have a lot of effect on it. They are actually quite useless and the oil spill is a huge disaster. It chokes the fishes and turtles, prevents them from moving, so they just die. And that can also be dangerous for humans, because that can irritate their organs and cause cancer.

As we saw, this oil spill has affected human life and wildlife and both of them have been highly impacted by this disaster, which threw Brazil into a dark and serious environmental crisis, with a lot of issues and consequences that the government has not been able to handle. Unfortunately, because of global warming, pollution, and overconsumption of countries which always want way more than what they have, this kind of disasters (natural or not) happen much more often than they used to. A single example in 2005: never before, since the beginning of records in 1850, have so many tropical storms occurred in the North Atlantic basin in one season: 28. But if we want to see some good through all this misery and sadness, at least, the oil spill in Brazil showed us that even without any help or motivation from people as powerful as government members, together, as citizens, individuals, humans, we can make a difference and act for what our future should be. And you, reader, you have to remember that strength does not necessarily come from important and powerful people, but from us, from our solidarity. Let's hope that it will never change.

"WE ARE IN DANGER"



Michelduchaine.com

The main reasons for the melting of glaciers

- *Human activities*
- *Deforestation*
- *Global warming*

Consequences

In 2000, the surface of the ice cap was about $6.32 \times 10^6 \text{ km}^2$ and in 2018, it was $4.59 \times 10^6 \text{ km}^2$. It represents a decrease of $1.7 \times 10^6 \text{ km}^2$.

The consequences of melting cap are numerous: Researchers said that the disappearance of the ice cap, which is triggered by global warming caused by rising carbon dioxide emissions from cars (transportation in general) and factories, is likely to have serious implications for the planet. A loss of sea ice means a loss of reflectivity of solar rays and further rises in global temperatures. Sea ice loss is now posing serious threats to the Arctic's indigenous species – its seals, fish, wolves, foxes and polar bears. "The Arctic food chain relies on a stable sea ice platform and that is now disappearing, putting the region's wildlife at risk," said marine ecologist Tom Brown, of the *Scottish Association for Marine*.

The melting of the glaciers

The first apparition of the effect of the melting ice in the world dates from 1850 in a National Park of the United States. Now, the phenomenon is getting worse and the temperature of the Earth's surface is increasing.

As the polar ice caps melt at a faster rate, the sea levels rise. The consequences of this will be of dire magnitude and people living in coastal regions all over the world will have to relocate, because of decreasing amount of living space due to soil erosion, flooding, and fresh water being contaminated with sea salt water.

While sea ice melting would not cause sea levels to rise around the world, the melting of polar ice sheets would, and research has shown that sea levels did rise during the last decade. From January 2003 to December 2010, ice cap melting essentially contributed to a 1.06 millimeter rise in sea level, according to a study from researchers at the *University of Colorado*.

We must change the way we live and respect the environment !



Louisiana is a state located in the southeastern United States, on the edge of the Gulf of Mexico. It is sadly known for its numerous floods, including the flood of 2016 above, which caused 11 deaths. Nearly 40,000 people were affected by this flood.

Hanifa , Nabil

Artificial Intelligence

Hi, today, December 13th, 2019, we talk about artificial intelligence!!! Let's jump to 2050!!!

December 13th, 2050, at the beginning of his day, William awakes peacefully because his **connected watch** analyses his sleep and wakes him up at the best moment (during the light phase of his sleep).



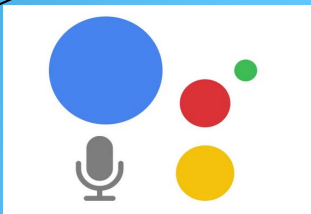
A picture of the future watch

Connected Watch

Today, we already have an idea of the future of connected watches. Indeed, they are already very developed and the future of this technology is foreseeable because this technology does not have a lot of possibilities in the future.

Thanks to a miniaturized polysmonogram which allows you to record your brain waves in the watch, you can monitor your sleep. So you can know when it is the best moment to sleep and if you should be having a long or a short night sleep but with a little nap during the day.

When he eats his breakfast prepared with the assistance of **G... Duplex**, he is alone but he talks with **G... Duplex** and has the same feeling as when he talks to a human being. Obviously, the A.I does not really feel emotions but tries to create emotions so you have the sensation to talk with a human being.



The logo of G-Duplex

It is a project of A.I., a kind of *G...Assistant* but way more developed. We suppose that in 30 years *G... Duplex* (or another service) will be part of our daily life. And we suppose it will be sufficiently developed to talk normally with humans.

All the objects of William are connected to *G... Duplex* so William can ask it to warm up his food or beverages. By using the engine *Tacatron 2*, the A.I. can speak like a human being (with "errrr..." and pauses for example). To create a program similar to human neural networks, *G...* uses LSTM (long short-term memory).

Did you know that?

You can learn programming language very easily by using very funny software as *Scratch* (for beginners) or *Microsoft Visual Studio* (for advanced users). We advise you to begin with Scratch to understand the algorithmic logic !!!

Maelle
Hugo NORTIER

Guess which company hides behind G... !!!

When William is ready, he takes **Waymo** to go to school.



Picture of Waymo

It is an autonomous car created by a famous company: *G...* It is a kind of cab. William orders *Waymo* and it arrives alone to take him to his destination without him driving. To move, it uses a lot of technology like *LIDAR* to detect distances thanks to light, radars, GPS. It is a very interesting project because it can avoid problems as accidents caused by human behaviours (high speed, slow decision making ...) even if there will always be

accidents due to bugs. Unfortunately, it will remove around 52,000 jobs just in France and that's why some people are skeptical about technological advances. It also causes some legal issues. For example, if someone takes *Waymo* but the weather conditions are very dangerous (a lot of snow, rain, wind...) and if they have an accident, who is responsible and who will pay the cost?

Once at school, **he learns thanks to A.I.** but if William has a question that A.I. cannot answer, a real teacher talks about that with William and answers his question.

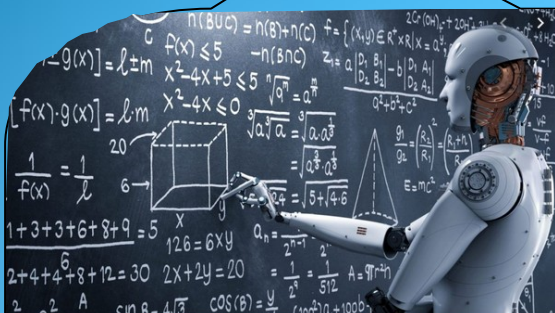


Illustration image

Technology is the future, and digital teachers can revolutionize the world of education. The machines will work at their own pace and progress with time and will get smarter in their learning through artificial intelligence.

Teachers (robots) never get sick and are therefore always present and can be replaced if they are broken.

They are not stuck in the public transports and they do not go on strike. They do not have requests like special arrangements (schedules, salaries, pensions, etc...). They will remain teachers in the school if the robots have problems.

A robot teacher in South Korea



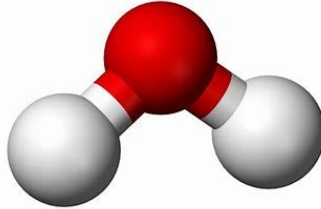
In South Korea, some students have been educated by a robot since nursery school. But the problems that arise are mainly on safety, particularly in terms of first aid and discipline. So, to solve a security problem it could be necessary to have a human being capable of practicing first aid in each school and if the robot detects lack of discipline, it calls a living person.

Maelle
Hugo NORTIER

The infinitely small

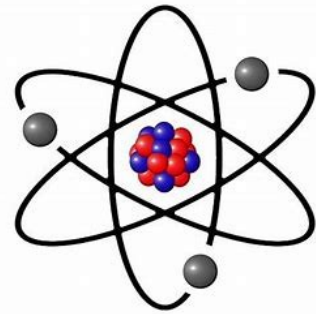
Why should we take an interest in particles? Because they make up everything! They form the Universe, they are the basis of the matter you are made of, the light around you and much more. This subject may seem boring, but you will discover there is nothing more interesting than the world of the infinitely small! It is governed by the laws of quantum physics: strange rules, opposed to the rules of the world we know. This type of physics is hard to explain, but we will try to make you “feel” that, behind your reality, there is a strange, invisible and fascinating world.

Zoom: From the molecule to the proton



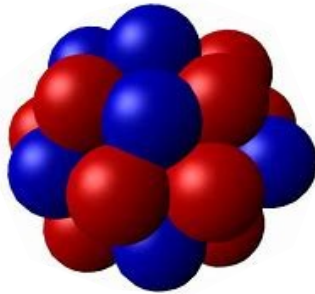
1: The molecule

To see a molecule as little as water (H_2O), we must zoom to 0.0000000001 millimeters. A molecule is an association of atoms: A molecule of water, for example, is composed of three atoms: 1 oxygen (red) and 2 hydrogen (white). The molecules are what define matter. For example, H_2O will always be water.



2: The atom

With the atoms, we can start to speak about particles. An atom is composed of a nucleus (positive charge) and electrons (negative charges). The electromagnetic force keeps the nucleus and electrons together (opposite charges attract each other). An atom is composed of 99.99 % of void.



Zoom: the quarks

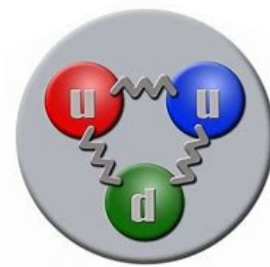
A quark is a little particle inside the proton. In **1 proton**, there are **3 quarks**. There are two types of quarks: the **quarks up** and the **quarks down**. To put it simply, let's say a proton has a charge of 1. In this case, a quark up has a charge of $+2/3$ and a quark down has a charge of $-1/3$. In a proton there are 2 ups and 1 down, and vice-versa in a neutron.

4: The proton

To see the occupants of a proton (or a neutron), we must zoom again. We call them the “quarks” and they are elementary particles: we cannot divide them. In a proton or a neutron, there are always three quarks

3: The nucleus

The nucleus is composed of two types of particles: the neutrons (without electric charge) and the protons (with a positive electric charge). So, the protons are responsible for the nucleus' charge. The number of protons defines which chemical element it is. For example, every oxygen atom has 8 protons.



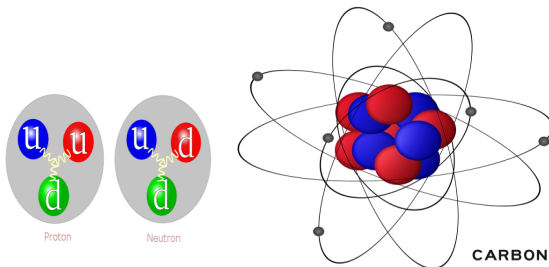
On the hunt for rare particles

Here is a little piece of the biggest particle accelerator in the world: The *Large Hadrons Collider*. In this ring of 27 km of circumference, protons are accelerated to 99.99 % of the light speed to be hit together. They are transformed in pure energy, in which new particles are formed. Most are already well-known, but there is so much energy that sometimes rare particles appear, some of which may never have been seen before. The Higgs boson is one of these particles, read our article on the next page!

THE HIGGS BOSON

What is the Higgs boson?

Let's take the example of an apple: if you zoom on this apple first you will see vegetal cells, then if you zoom again with adapted equipment of course (*electronic microscope*) you will see saccharine molecules (sugars), then if you zoom AGAIN, you will see either a carbon atom, an oxygen atom or a hydrogen atom. If you zoom AGAIN (that's a lot of zooming!!) you will see the core of the atoms with the protons and the neutrons.



If you zoom (again?) again on a proton or a neutron, you will see the quarks and from here it becomes interesting: it exists 6 types of quarks: up, down, charm, bottom, top and strange, it is important to know the types of quarks to better understand what the Higgs boson is. Each association of quarks will form either a proton, a neutron or an electron. The study of quarks is interesting but this is not what we need here so we will zoom again. After having zoomed on a quark, the elementary particles of which the Higgs boson is part will appear. So, here we are, the Higgs boson is an elementary particle. Indeed the Higgs boson is not only an elementary particle, it is THE elementary particle because the Higgs boson is the particle that is responsible for the weight of all that exists (except the photons that are not affected: their mass equals 0)

Who is Peter Higgs?

Peter Higgs is a physicist who was born on the 29th of May, 1929. He received the 2013 Nobel Prize of Physics for proposing a theory about the existence of the Higgs boson, in 1964. He waited 58 years for his theory to be proven.

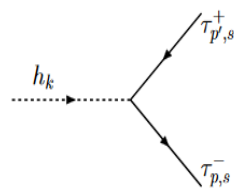
How has the existence of the Higgs boson been proven?

The existence of the Higgs boson has been proven in Geneva in the *Large Hadron Collider (LHC)* in 2012. The *LHC* is the world largest and most powerful particle accelerator. The *LHC* consists in a 27 km ring of superconducting magnets (magnets that have been cooled to a very low temperature in order to conduct electricity optimally) with a number of accelerating structures to boost the energy of the particles along the way.

Facts about the Higgs boson:

The term "boson" comes from the name of Indian physicist and mathematician Satyendra Nath Bose.

Higgs was not the only physicist who contributed to the idea of how to give particles mass, many other physicists have worked on it but only the Higgs' theory was probable.



Feynmann diagram of the Higgs boson: we can see that after a little period of time, the Higgs boson separates into two leptons.

News of the Space

The smallest planet contemplates the biggest star in our solar system

Mercury is the smallest planet of our solar system but it is the closest planet to our star. Its name comes from the Roman deity Mercury, the messenger of the Gods. Mercury transit is a phenomenon when Mercury passes in front of the Sun, during a predetermined period of time. As we can see on the picture on the right, the little black dot on the Sun is Mercury. Mercury transit is a great thing for science because it is a rare event and it helps astronomers determine the distance to our Sun. On November 11, 2019, Mercury passed between the Earth and the Sun. Only the South of America and a part of Antarctica could see this special moment. This phenomenon lasted between four and five hours. The next Mercury transit will be in 2032. The last time it happened was 13 years ago.



Family holidays in orbit around the Earth will be a reality soon

This is the project of the Gateway Foundation. They would like to create the first spaceport which will be built from 2025. There will be scientific research labs and also a hotel for 450 guests, called the Von Braun. The project was inspired by the ideas of Von Braun a spaceflight genius, hence the name of this hotel. But there are constraints and they have to answer some needs. As we can see on the picture on the right, the hotel has a wheel shape which permits to generate a gravitational force, so the residents can walk on the floor of the station. The construction process will be carried out by automated systems, such as drones and robots in orbit, which will assemble the elements of the station.

One step forward for their careers and two steps forward for women in space

Since 1964 there were 200 spacewalks. A spacewalk describes the actions that astronauts perform outside the capsule, such as repairs or experiments and only 15 of these astronauts were women, accompanied by men, of course! An all-female spacewalk was planned in March 2019 but there was a problem with the spacesuits: there were only two female suits, one of which was broken. All the other spare suits were for males, so the spacewalk was cancelled because it is impossible to go out with an unfitted suit. Space suits are indispensable to protect astronauts from extreme temperatures, cosmic rays and micrometeorites. Eventually, on October 18, 2019, for the first time, an all-female spacewalk was organised, with Christina Koch and Jessica Meir (on the left). It was an exceptional event.



The end of the world...is not coming soon

On May 2, 2019, a big asteroid called 2019 OK, estimated between 57 and 130 meters wide, came towards Earth and a lot of people were afraid of the damages this asteroid could cause. An asteroid is a piece of rock that travels through space and orbits the Sun. They are gravitating rocky bodies, remnants of an undeveloped planet. They can measure a few tens of meters up to 1000 km. There are millions of them in our solar system. NASA said they could launch a spacecraft to scan the threatening asteroid and to know how they could deviate it, if necessary. This asteroid was not the first asteroid scientists had to track.

News of the Space

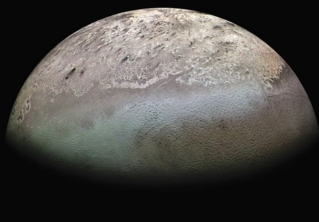
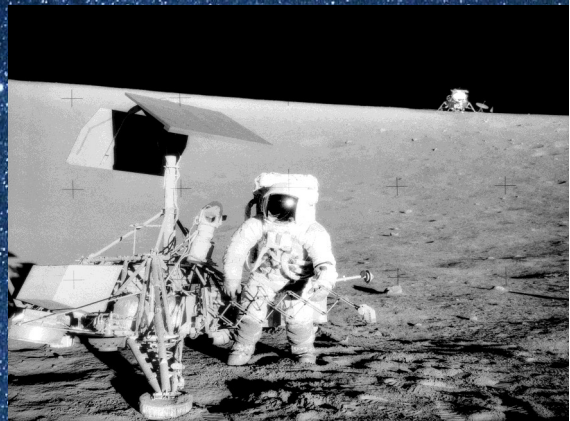


The ephemeral face of the Moon

The super wolf moon as we can see on the picture on the left is a special type of lunar eclipse. It is an optical phenomenon of light diffusion and dispersion that occurs during the eclipses of the Moon. The last lunar eclipse we have seen was on January 20/21, 2019. The name of this special lunar eclipse is 'Supermoon'. The 'Supermoon' is red because the shadow of the Earth passes across the Moon and the color results from the sun lights that are refracted in the Earth atmosphere. The super blood wolf moon happens to coincide with the wolf moon that is the traditional name of the full moon of January. We see the Moon bigger because it is closer to the Earth than usual. Normally the Earth-Moon distance is 384,400 km while during super wolf moon the distance is 356,511 km.

Happy Birthday Appollo12

Last year was the 50th anniversary of NASA's mission Apollo 12. Apollo 12 was launched on November 14, 1969. It was the event of the year because it was only the second mission where humans walked on the moon and it seemed futuristic. We can see Pete Conrad, the captain of the mission, on the right on the picture taken the same day on the Moon. This mission was carried out by three men: Pete Conrad, Richard Gordon and Alan Bean. On the spacecraft of Apollo 12 mission we could see the damages made by the Earth atmosphere. Apollo 12 was a mission to learn more about the effects of long-term exposure to lunar exposition, to develop new launching techniques and experiment techniques to live in the lunar environment. The automatically-guided spacecraft landed just 183 meters away from the initial target.



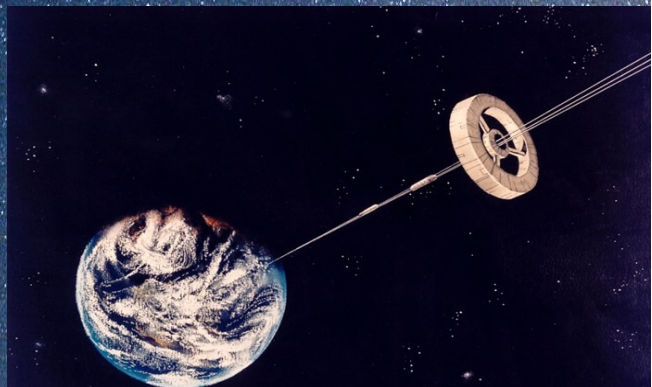
Lavenir.net

The cold twin of the Earth

In 2019, three planets were discovered and one could be habitable. The name of this planet is GJ 257d. It is 31 light years from Earth. Its size is similar to our Earth's. But there is a problem; we need 670,000 years to go to this planet and for the moment we have no solution to keep people in life during the journey. The temperature of this planet is -53°C but because of its atmospheric pressure and the greenhouse effect that would warm the surface it is possible to find liquid water, which is an essential element for life. GJ 257d was found thanks to a NASA's satellite in April 2019.

An elevator for a new life

The space elevator is a project which makes the elevator invention concrete. It aims to send more easily people and equipment out of the Earth's atmosphere. The space elevator would be a spacecraft in orbit around the Earth, or another star such as the Moon, or another planet. This concept is based on the idea of a cable held tight by the centrifugal force due to the rotation of the Earth on itself. It is really difficult but in theory it is possible with our technologies. The spacecraft would be 42,146 kilometers away from Earth.



Space legal issues

The A.I.s are magic!

MADE BY
ALEXAUCISSON

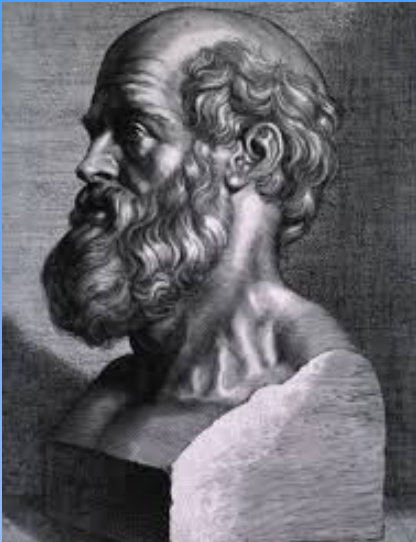


This morning...



From Hippocrates...

...to modern medicine



Hippocrates



3D printed organs

2,400 years later...

Special section Medicine



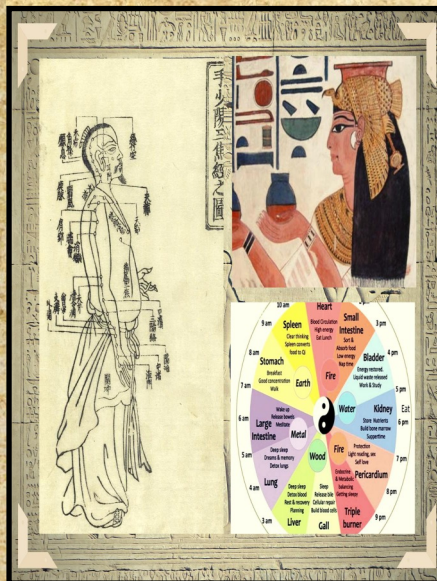
Discover how to protect yourself from
diseases and addictions

Thanks to the progress of technology, robots can perform operations for us: here is a surgical robot.



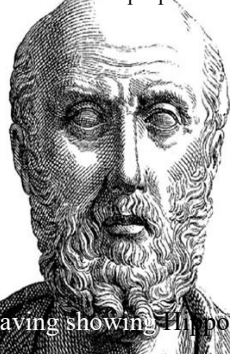
Medicine in the past

The methods of ancient Egyptians and Chinese inspired other regions of the world, the Greek and Romans for the first ones, and the Asian world for the others. The Egyptians were clearly in advance on their time because they already knew the importance of hygiene in treating patients as they had identified the existence of germs. They used pharmaceutical cures and aromas and massages to heal people. The Egyptologist Barbara Watterson even said "The mortality rate following medical procedures in ancient Egypt was probably less than that of any European hospital in the Christian era until the mid-20th century", and that is quite a fact! But even if they had an impressive knowledge of all these techniques and even of human organs, they were so surrounded by magic, Gods and superstitions that most doctors used magic spells and incantations instead of all the techniques they had, so even if they were good at curing injuries, they had difficulties to heal diseases. The Traditional Chinese medicine (TCM) is mostly about spiritual medicine, with a huge importance for the harmony of two powers (yin : passive and yang : active). The first Chinese doctors used acupuncture and medicinal cures to treat people when they were sick or just to prevent the illness from spreading into the population. This kind of medicine has existed for over 23 centuries and is still used today. There are also other ways to heal people that are part of the TCM, using the meridian channels of the human body or herbal therapy.



Illustrations of some Egyptian and Chinese medical techniques

<http://www.thefamouspeople.com/profiles/>



Engraving showing Hippocrates

Do you see this man on the left ? His name was Hippocrates, and he was one of the most famous doctors in history. Called « the father of the medicine », Hippocrates was a physician, a doctor and a teacher who was born in 460BC. in ancient Greece. He represented perfectly the idea of medicine of the old Roman and Greek *Imperium*. This man wrote several books and texts about medicine, physical, moral and ethical sciences, even if nowadays it is said that most of these books have been written by someone else who was just taking advantage of the famous name Hippocrates. Even the most famous text written in the name of Hippocrates, the "*Hippocratic Oath*", could have been written not by him, but by other doctors. *The Hippocratic oath* is still supposed to be sworn by doctors and physicians, but they face a lot of difficulties because it is so old to be fully true and relatable, even after all the corrections made.

Let's write about the Middle Ages. Actually, as it is always said, the Greek and other ancient forms of medicine were not forgotten during this period, they were just reserved to the highly educated and rich people, hidden into monasteries. So for normal people, it was the darkest medical period of all times. People did not know how to face diseases or injuries and sometimes their "cure" hurt people instead of healing them. Most of their cures were based on religious and astrological beliefs. They thought that the stars and the Moon could help them with diseases and injuries so they usually consulted them before trying to heal people. Then, they used such things as bleeding (when doctors made the patients bleed, because they believed that the disease would go away with the blood) and basic surgery. They also based their cures on urine color and that's why most doctors were represented with urine flasks in their hands. And finally, most people were healed in churches because medicine was quite close to their religious beliefs, and when they did not that was because they were treated with occult medicine (or at least tried to be cured) a cure somewhere between medicine and magic.



<https://www.hl.uk/the-middle-ages/articles/medicine-diagnosis-and-treatment-in-the-middle-ages>

Little quiz about Hippocrates :

When was he born ?

- ☐ In 2020
- ☐ In 460 BC
- ☐ In 400 BC

What was his job ?

- ☐ Doctor/philosopher/physician
- ☐ Florist/baker/cook
- ☐ Crazy/curious/skind

Who wrote the Hippocratic Oath ?

- ☐ An idiot
- ☐ Most likely Hippocrates
- ☐ Neil Armstrong

SEXUALLY TRANSMITTED DISEASES

HIV

HIV is a virus that can cause AIDS. HIV affects the immune system, and more specifically colonizes immune cells: the T-CD4 lymphocytes. It replicates itself within these cells by introducing its genetic program in the cell's DNA. T-CD4 lymphocytes will then start producing viruses thanks to the viral genes. It creates reservoirs of latent virus that remain for life. The lymphocytes no longer work for the immune system and create many HIV until they die. Because of the way the virus works, our body is more susceptible to diseases.

There are two types of HIV: HIV-1 and HIV-2. Their differences are in the molecules. In France 98% of people have HIV-1, whereas HIV-2 is mainly present in West Africa.

AIDS is the terminal phase of the disease caused by HIV. Without effective antiretroviral therapy, a person with AIDS becomes very vulnerable and eventually dies. Thanks to recent treatments, people are living with HIV and remain in good health.

PROTECT YOURSELF!!

The only way to avoid the virus is by using male or female condoms. HIV spreads by semen, vaginal secretion, blood and breast milk. You also can contract it because of an unsterilized syringe but you cannot contract it by urine, saliva or sweat because the quantity of viruses in these fluids is too low.

Some people can have HIV for their entire life and some time they do not even know it. They do not necessarily develop AIDS but they can transmit it to another person. That's why you must be protected during any sexual intercourse before testing.



Papillomavirus

99% of cervical cancers are caused by chronic papillomavirus infection. 80% of sexually active men and women come into contact with a papillomavirus one time or more in their lifetime.

Condoms can protect you from this virus but only at 70% because it can be transmitted by anal, oral or vaginal intercourse. For girls, screening is carried out mainly by smear tests which consists in taking cells from the cervix. For boys, you have to go to an urologist and do a peniscopia. The doctor examines the penis with a binocular magnifying glass, if there is a problem he will take a sample and send it to the laboratory.



A few contraceptive methods

WARNING, not all of them protect from STIs

The contraceptive pill prevents pregnancy but does not protect from STIs (Sexually Transmitted Infections). The pill has to be prescribed by a doctor. It is used to block the ovulation.

The IUD. (Intrauterine Device) It is placed by the doctor in the uterus during a very simple procedure. It lasts 3 to 5 years. The IUD prevents pregnancy by not allowing the sperm to fertilize the egg or by stopping the embryo from nesting in the uterus. It does not protect from STIs!

Female condoms protect against STIs and avoid unwanted pregnancy. They are in latex or synthetic material. They need to be placed inside the vagina before any contact with the penis. They prevent pregnancy by stopping sperm from meeting the egg.

Male condoms: using a condom during sexual intercourse is a solution to avoid unwanted pregnancy and STIs. Before using one you have to check the condom package, notably check the expiration date printed on the back of the package. The condoms prevent sperm from getting into your partner's genitals, mouth or anus.

THE DANGERS OF ALCOHOL

“Stay alive, don’t drink!”

ADDICTION

Nearly **10 million young people**, aged 12 to 20, report that they have consumed alcohol in the past 30 days.

“*Binge drinking*” is a phenomenon mainly widespread among teenagers. It is an excessive and punctual consumption of alcohol. For several years, this phenomenon seems to spread in France. The most notable example of this is among young women. The highest age-specific proportion of female binge drinkers is in the 16 to 24 year-old age bracket.

When you drink too much alcohol, you may develop a physical and emotional dependency.

As a teenager, you might be influenced to drinking alcohol by the people around you. The purpose of this article is to warn you about the dangers of alcohol.

Alcohol addiction takes time to develop but habitual drinking will affect the brain and the body. It will start to make the drinker dependent. Alcohol floods the reward center of the brain, the nervous area devoted to feeling pleasure thanks to **dopamine**, a neurotransmitter (a molecule created by the nervous system to send messages between nerve cells) that creates feelings of euphoria, giddiness, happiness and playfulness. Which means that when you drink, first you feel good, before feeling really bad!

Drinking also makes it difficult for your brain to create long-term memories. It reduces your ability to think clearly and to make rational choices. Over time, frontal lobe damage can occur. This area of the brain is responsible for emotional control and short-term memory.

The alcohol molecules damage the outer cell membrane, penetrate the cytoplasm and destroy the inner structure of the cell molecules and of the cytoplasm's proteins, by modifying the fluidity of the membrane and thus modifying the communication of the cells between them, that's why alcohol makes us clumsy and confused. The central nervous system is particularly sensitive. That's because alcohol can pass through the blood-brain barrier, reaching neurons directly. Once alcohol touches these cells, they are changed, resulting in changes in behavior.



0 980 980 930

0 811 91 30 30



MUSCLES & SKELETON

Long-term alcohol consumption may prevent your body from keeping your bones strong. This habit can cause thinner bones and increase fracture risks. Moreover, fractures may heal more slowly.

Drinking alcohol may also lead to muscles weakness, cramping, and eventually atrophy.

Alcohol can also affect your heart and lungs. People who are chronic alcohol-drinkers have a higher risk of heart-related issues than people who do not drink. Alcohol is irritant, it actually burns when it touches any bodily surface. You will notice an immediate burning sensation as it goes into your mouth and down the delicate lining of your esophagus that also can eventually kill your body living tissues.

Dependency is a hard thing to stop, but it is not impossible. If you need help or someone to talk to, do not hesitate to call the numbers at the top of the page.

Hanifa, Nabil

DANGERS FOR YOU!

Yes, YOU ! YOU, the teenager who is reading this magazine, there are a lot of dangers around you in your daily life but you do not necessarily see them. You were not vigilant but with this article, you will be. Drug is a huge danger for teenagers. You can see drugs, you can snort drugs, you can even drink them or smoke them, but, do you know how bad they are for your brain and your body?



CANNABIS, the most famous drug

First of all cannabis is a plant. People have always used it to cure some injuries or diseases like vomiting or parasitic infectious diseases in South America for example. But with time, humans found another way to use it and this is the one that everyone knows now, the medicinal properties of the plant have been replaced by its narcotic effects. Now, we use cannabis to smoke it as a recreative drug.

The effects of cannabis on the body

According to a scientific study led by the *American Academy of Science Engineering and Medicine* and published in a one hundred-page report we can list many negative effects of cannabis.

When you drive, cannabis intoxication increases the risk of accident because the drug slows the reflexes down. Smoking cannabis develops the risk of lung cancer. This is the same as for tobacco smokers, the carbon monoxide sticks to red cells and disrupts the oxygenation of the body which causes cellular death and creates mutations that can lead to cancer.

Smoking cannabis exposes the body to many diseases like chronic bronchitis that causes coughing and spitting. Cannabis affects the immune system and increases the risk of contracting infections.

All the products that can make humans addicted have one thing in common. They increase the amount of dopamine available in an area of the brain, the reward circuit. Information circulates in the brain through electric activity. Dopamine is the neuromediator of pleasure. When it is released in the central nervous system, we feel a state of physical and mental well-being, even in the event of physical or mental suffering. In case of recurrent drug use, the brain will seek pleasure in these "artificial paradises" and trigger dependence.

THC (tetrahydro-cannabinol, active substance in marijuana), binds to specific receptors, called CB1 receptors, in the brain which affect the liberation of neuromediators. When consuming cannabis or any other drug, the amount of released dopamine increases. The loss of CB1 receptors in the cerebral arterioles of cannabis users causes a reduction in blood flow, glucose and oxygen supply. Therefore their brain is less performing.

GHB, the drug of the rapist, the biggest danger in night-clubs

GHB circulates in the form of powder, liquid or pills and is very dangerous. If you meet an ill-intentioned person, one minute of inattention and you can wake up next to a stranger with used condoms. You have just been abused or raped because of a forgotten glass on a table or because you have been distracted.

The effect of GHB on the body

The effects last about an hour but GHB is detectable for twelve hours. There are many consequences to GHB intoxication. After a high consumption of GHB you can feel nauseous, have a blurred vision, hallucinations and an overdose. If you have taken low doses of GHB you can have headaches, low blood pressure, muscle tremor, nausea or diarrhea. GHB slows down neurons and has an anesthetic effect.

How to avoid being drugged ?

Do not accept a glass from a stranger. Do not go out alone and always keep an eye on your glass and your friends'.

You can buy a cup condom invented by New York students. The cup condom is a plastic protection for glasses that is put on the glass to protect you from any unwanted experience.

VACCINES

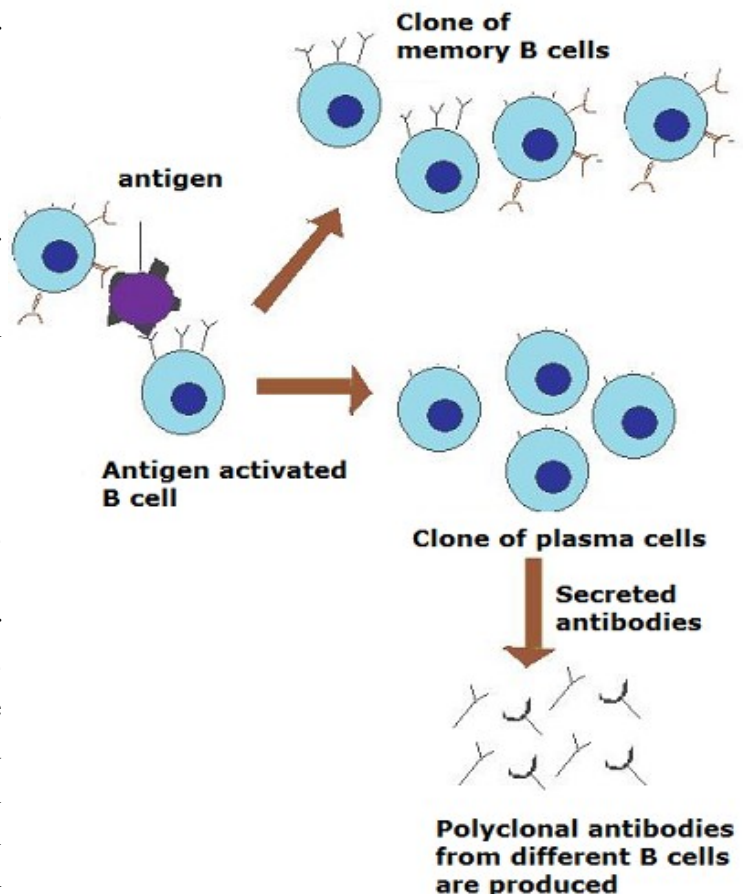
What are vaccines?

Vaccines protect people against serious and/or deadly diseases by stimulating the body's immune system. Each vaccine produces immunity for only one disease. The majority of vaccines are given by injection but sometimes they are given nasally or orally. Vaccines consist in introducing an attenuated version of a pathogen in your body.

Infectious agents are multiplied in laboratory until they naturally or artificially lose their pathogenic characteristics. The strains obtained are made incapable of developing the disease.

Thanks to that your body create antibodies and memory cells.

During the first natural infection or after vaccination, the body B and T-lymphocytes participate in adaptive immune response. They are activated by the antigens (molecular patterns on the surface of the pathogen) and form memory T and B-cells specialized in the specific antigens of the pathogen.



So when you are vaccinated against a disease, the immune system which has memorized the germ and created antibodies knows how to destroy it faster. It is when B-lymphocytes and T-lymphocytes enter into action thanks to a team work. B-lymphocytes that have the ability to recognize and neutralize pathogens and T-cells that recognize and destroy the cells infected by viruses destroy the pathogen. This process occurs faster during the second encounter with the pathogen than during the first encounter and therefore the germs are destroyed before you get sick.

In addition, memory T and B-lymphocytes which have a much longer lifespan, will then circulate while waiting to encounter the same antigen. As they are more mature they react faster and stronger, so the person will not suffer from the symptoms of the disease.

The first eradicated disease : Smallpox

Vaccines succeeded in entirely wiping out smallpox, a horrifying, deadly, and disfiguring disease caused by the smallpox or variola virus.

First symptoms include high fever and tiredness, followed by a characteristic pus-filled rash, mostly on the face, arms and legs. Smallpox is propagated primarily through airborne respiratory droplets or saliva. If it did not kill you, it often left disfiguring marks on the skin.

In 1796 Edward Jenner developed the first successful vaccine against smallpox. He used pus from a related but less powerful disease affecting cows.

Edward Jenner found that several of his patients were immune to inoculation. After investigation, he discovered that they were farm jacks in contact with cows infected with cow pox. This mild disease is common in jacks who milk cows and touch pustules. He was able to make the connection between cow pox and smallpox. Being in contact with cow pox had the effect of immunizing jacks against the real smallpox. So he took pus from the hand of a woman who had been infected by her cow and inoculated it to an 8-year-old child, James Phipps. He contracted the disease as a single pustule and healed very quickly.

But unfortunately all of Edward Jenner's scientific researches on vaccines were not as successful and sometime resulted in the death of his patients.

More than one century later, in 1979, after a world-wide vaccination campaign, smallpox was declared eradicated.



Edward Jenner (1749 - 1823)



Child with Smallpox, Bangladesh (1973)

People's doubts about vaccines

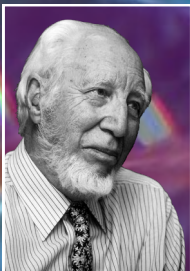
Today, some people are skeptical about vaccines because of alarming information on the Internet and because of a research conducted around 1990 that vaccines and autism had a connection, but this study was proven to be a fraud, the conduct of the experiment was not really reliable.

MEDICINE OF THE FUTURE

3D printed human organs, a solution to all the dying patients! September 2016, 6,599 patients were on the organ transplant waiting list. The majority of them, in the UK that is, requires kidney transplants or lung and heart transplants. A lot of organ transplants were carried out from April 2015 to March 2016, around 4,600 organs from 2,400 humans. As you can see, human donors are really hard to find. That's why scientists thought of creating artificial organs based on a 3D bio printer.

AN ARTIFICIAL HEART ?

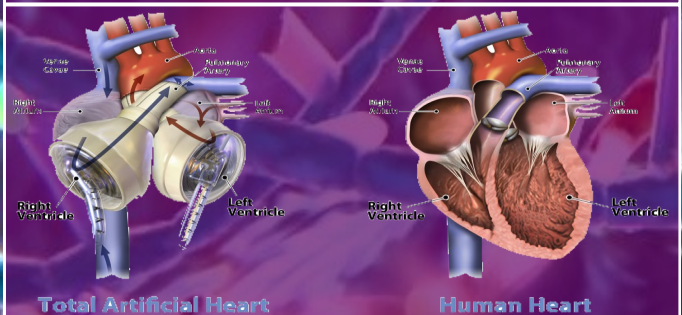
A 69-year-old man claimed that he could live a normal life with his artificial heart. Those are designed to last up to five years for patients whose bodies are not suitable or are just waiting for a donor. The French biomedical company *Carmat's* first transplanted patient, was a 76-year-old man but he died in March 2014, two and a half months after his operation. However, this patient was feeling better than ever after receiving his artificial heart. Unlike a donor heart, an artificial heart is available when needed, not restricted by blood type or antibody level and is biocompatible with the body (no anti-rejection medications needed). The artificial heart is activated and monitored by an external machine called a driver, which produces pulses of air and vacuum that help pump blood in and out of the ventricles. This process will replace the ventricles and valves of a real heart. Now let's talk about how scientists are going to create them.



Willem Johan Kolff, born in 1911, Leiden, Netherlands, is the father of all artificial organs. He decided to create organs based on inanimate polymers and/or metals. He passed away in 2009.

3D BIO PRINTING

That's where the 3D bio printer comes out. Pre-bioprinting is the process of designing a model that the printer will later create and of choosing the materials that will be used. Bio printing human organs began in 1983. Scientists went on the hunt for such materials and by the late 1990s, they had viable techniques and processes to make organ-building a reality. Bioprinting is an additive manufacturing process where biomaterials such as cells and growth factors are combined to create tissue-like structures that imitate natural tissues. The technology uses a material known as bioink to create these structures in a layer-by-layer manner.



The technologies used are computed tomography and magnetic resonance imaging scans. Bioprinting is the actual printing process, where bioink is placed in a printer cartridge and deposition takes place based on the digital model. Post-bioprinting is the mechanical and chemical stimulation of printed parts so as to create stable structures for the biological material. In 1999, scientists at the *Wake Forest Institute for Regenerative Medicine* used a 3D printer to build a synthetic human bladder. They then coated it with cells taken from their patients and successfully grew working organs. In 2002, scientists printed a miniature functional kidney capable of filtering blood and producing urine in an animal model. Bio printing is still an ongoing project and scientists hope to release this new technique soon.



3D printer

ROBOTIC SURGERY

Robotic surgery allows doctors to perform many types of procedures. In 2000, the *Da Vinci Surgical System* was the first robotic surgical system which was made by an American Company *Intuitive Surgical*. Robotic surgery can help human surgeons because it delivers precision and flexibility in complex surgeries. There are many advantages to this new medical system. Patients recover more quickly than with a traditional surgery because robotic surgery is minimally invasive, it will take the body less time to recover. Then, there is less pain and blood loss because with smaller incisions and better precision, patients feel less pain during and after surgery. However, there are still some risks, such as a small risk of infection and other complications due to the robots not working or not being properly sterilized. The main disadvantage of using robotic surgery is financial because it costs a really large amount of money. There is also the issue of movement latency, with the time it takes for the robot to carry out the surgeon's commands, it makes it difficult for surgeons to respond quickly to problems that occur during the operation. But, robotic surgery can still save many people from dying of a too complex procedure or even create new ways to cure diseases.

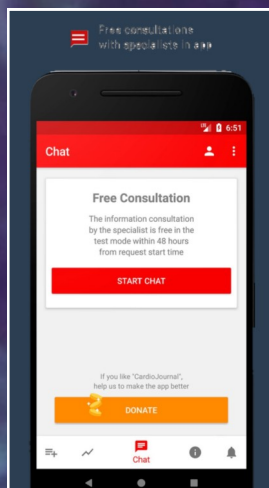


Robots during a surgery



DIGITAL MEDICINE

A pill that lets you know you have taken it is really interesting because patients on regular medication can find it difficult to remember if they have taken the right dose at the right time. That's why digital medicine was created. Their goal is to introduce technology in medicine so patients can cure themselves because we do not always have the time to go to an appointment with a doctor or because some disabled people cannot go out easily to see one. A new pill has been created that contains a tiny sensor recording when it is taken. The information will then be transmitted to a patch worn by the patient and then sent on to a Smartphone. This pill is also useful for people with mental affections, including depression and bipolar disorder. It helps people who cannot stick to pill regimens. There are also other applications where healthcare can be provided at a distance via phones. Patients can use devices to measure blood pressure, monitor glucose levels, test blood samples, and send the results in real time to their doctors. *Cardio Journal*, for example, is a really great app. You can track your blood pressure really easily and there are even free consultations with a specialist! To track your blood pressure, you have to measure your pressure and write it down in the app and if you do this regularly, the app will provide you with the statistics of results.



Cardio journal

Dinosaurs

Is Jurassic Park possible in real life?

Since the movie *Jurassic Park* was released in 1993, we have all wondered if it could ever be possible to resurrect dinosaurs. According to *Jurassic Park*, creating dinosaurs is an easy thing. The scientists in the movie take tree sap that has fossilized, thus preserving insects from the Jurassic inside of it. But real life scientists say that dinosaur DNA is difficult to obtain and to sequence and, if the DNA was obtained and sequenced, there would be some gaps in the DNA sequence that would have to be filled. Unlike in the movie, these gaps cannot be filled by frog DNA.



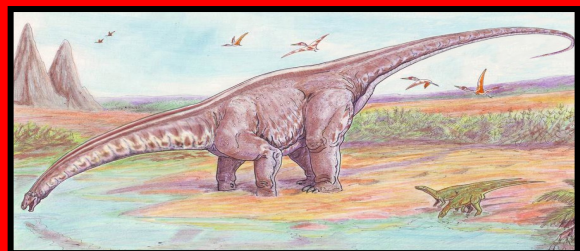
Fr.wikipedia.org

When DNA is sequenced and completed, it must be put into an oocyte (female gamete that has not yet reached maturity) so that it can be cloned. The oocyte must come from the same organism that is cloned, and as all dinosaurs are dead today, this would be impossible. We can't insert the DNA into crocodile ova because crocodile ova are specialized for crocodiles, not for dinosaurs. Even if this happens, dinosaurs need their own eggs not turtle ones like in the movie. So, as you can see, there are lots of factors that make it impossible for *Jurassic Park* to become a reality. With today's technologies, we can't do it. Maybe in the future, we might have the technology and the ability to clone dinosaurs and to create them.

Dr Susie Maidment, a paleontologist, says that even if you find blood or soft tissue, you do not necessarily find DNA. Ancient DNA has so far been recovered from permafrost (a thick subsurface layer of soil that remains below freezing point throughout the year, occurring chiefly in polar regions), as well as from sub fossils, bones or body parts that have not yet fossilized. She also says that dinosaur DNA can be filled with bird DNA because birds are dinosaurs or with crocodile DNA that most closely resembles that of the dinosaurs but it is impossible, biology does not work that way.



A false article came out recently claiming that British scientists had cloned a dinosaur but the dino picture they used was apparently a baby kangaroo, not an Apatosaurus. In short, unfortunately, we are never going to experience a real life *Jurassic Park*. But this might be a good thing. If we are to learn anything from films... It would probably be a disaster.



The different hypotheses about the extinction of dinosaurs

Giant meteor

The most well-known theory for the death of the dinosaurs is the Alvarez hypothesis. This hypothesis proposed the notion that a meteor the size of a mountain slammed into Earth 66 million years ago, filling the atmosphere with gas, dust, and debris that drastically altered the climate. The only dinosaur group known to have survived is the Aves, which means birds.



Massive volcanic eruption

However, other scientists maintain that the evidence for a massive meteor impact event is inconclusive, and that the most likely culprit may be Earth itself. 65 million years ago, massive outpourings of lava spread. Such a vast eruptive event would have choked the atmosphere with carbon dioxide and other gases that would have dramatically changed Earth's climate.

Mammal Competition

Perhaps dinosaurs were driven to extinction by competition. Packs of small mammals would have competed with dinosaurs for food. And carnivorous mammals would have preyed on dinosaur eggs. Not only did mammals likely compete with dinosaurs for resources, many of them survived the end-Cretaceous extinction and subsequently came to dominate Earth.



Some scientists believe that Tyrannosaurus Rex may have been able to run as fast as 18 mph (28 km/h).

Dino facts

40% of Americans believe that men have lived at the same time as dinosaurs.

The biggest plant eaters weighed over 100 tons. Some of the biggest plant eaters had to eat as much as a ton of food a day. This is similar to eating a bus-sized pile of vegetation every day.

There are currently over 330 described dinosaur species and this number is growing.

The Megalodon was the biggest prehistoric fish. It looked like a shark, though it was three times bigger.

One paleontologist, Othniel Charles Marsh, theorized that dinosaurs had a second braincase located near their posterior. Scientists now know this fact to be false.

THE INCREDIBLE POWERS OF ANIMALS

Now you guys have reached the most interesting page of this magazine. You are going to discover our ranking of the animals with incredible powers. We have ranked these animals from 6 to 1.

Who will win? The prawn that can fireball? The immortal blob? You are going to find out now!

#6

TURRITOPSIS NUTRICULA



The *Turritopsis Nutricula* is a jellyfish which lives in the Caribbean sea. It is five millimeters tall. This jellyfish restarts its life, returns to the polyp stage (baby stage), and repeats this action later when it gets old, possibly infinitely. It does that when it is stressed or when it does not have food. As we said before the special power of this jellyfish is immortality, it is the first species in the world to reset its life and to reverse its aging process. It can make that thanks to transdifferentiation. Selector genes allow cells to position themselves well and have a precise shape. Homeotic genes are responsible for placing organs in the right places during the development of the organism. These genes are actually responsible for encoding transcription factors that activate or deactivate other genes. Thus, this means that the combination of homeotic genes and selectors that had been determined during development has changed drastically. Therefore, the altered transcription factors would allow the cells to transform into new cells.

#4

TARDIGRADE

This species was discovered in 1773 by Johann August Ephraim Goeze. The special power of this species is that it can survive at -272°C . and at $+150^{\circ}\text{C}$. as well! They can survive in the interstellar void, to toxic produces, to dehydration and to lack of oxygen. To survive tardigrades can take a special form thanks to a process called cryptobiosis. It is a state of stasis: totally inactive, the organism can then maintain itself as it is for an indefinite period of time, and resist many physical constraints before being reactivated under the right conditions, and this as long as it is not mechanically destroyed by sufficient force.

#5

AXOLOTL



The axolotl has a white body and black eyes. It is an amphibian (animal vertebrates that live on land and in water). It is an animal that spends its life in the larval state (it never turns into an adult), This phenomenon is named neotenia.

It is a large salamander (30 cm long for 225g). They live in Xochimilco, a lake in Mexico. There were 6,000 of them in this lake. $61^{\circ}\text{Fahrenheit}$ (16°C .) is a good temperature for them.

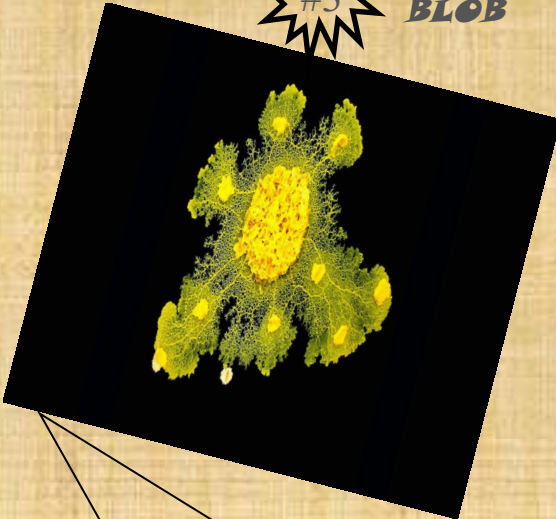
Today, many axolotls are hosted as pets and put in aquariums. They are very famous on social media because they look cute. It is sad because axolotls are few in number and are in critical danger of extinction.

Yet, this animal has the ability to regenerate damaged or destroyed organs. It can reconstruct a missing eye or even recreate parts of its brain if they are destroyed. Their pax3 gene is replaced by the pax7 gene, it is this gene that allows them to regenerate themselves.



#3

BLOB



The blob is a large, brainless cell that can learn. Neither fungus, nor animal, nor plant, nor bacteria. You can find it in the forests where it can choose one of its 221 forms. Its diameter is 10 cm. We do not know if it is immortal, but if we cut the blob, it heals naturally. If we cut it in half, the other part can survive. It is also able to teach another blob a skill (for example to cross a salt zone, since the blob does not like salt). To do this it merges with another blob and these two blobs form a vein that they will have in common. The information will go through this vein. When the other blob has learned the skill, the two blobs will separate and become two.

#2

HONEY BADGER



This is a mammal that lives in Northern India or in South West Asia. It can survive the most dangerous snake venom because it can absorb and metabolize venom which makes it survive the bite. After being bitten by a snake, it can be in a coma during 3 or 4 hours, because poisonous snakes have a venom that passes to the nervous system, and then recover totally. From their young age, their mothers reinforce their resistance to venom by forcing little honey badgers to fight against snakes or little scorpions for instance. That's why they can survive. They are very aggressive, among the most aggressive animals. In addition to snakes, they can eat little wolves or eagle chicks.

#1

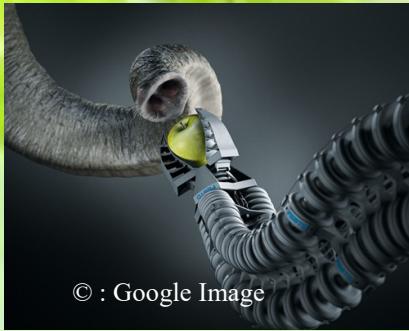
THE BEST OF THE INCREDIBLE SPECIES



This shrimp lives in rocks or corals in Tortugas, Florida. They measure 3 to 4 cm. One of its clamps is bigger than the other, and this large clamp can close in less than a second at a speed of 100km/h. This creates a water jet, which is such a powerful shock wave that it stuns and kills any opponent. This ability helps the shrimp to protect itself and to kill small fish or shrimps. The speed of its clamps produces the world's highest noise, reaching 220 decibels (for example an airplane makes a sound of 130 decibels).

BIOMIMICRY

Biomimicry is an approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies. And it is about taking inspiration from animals and plants to create new technologies to improve our daily lives. There are many examples that can be quoted in this article. Here is our selection of the most impressive ones!



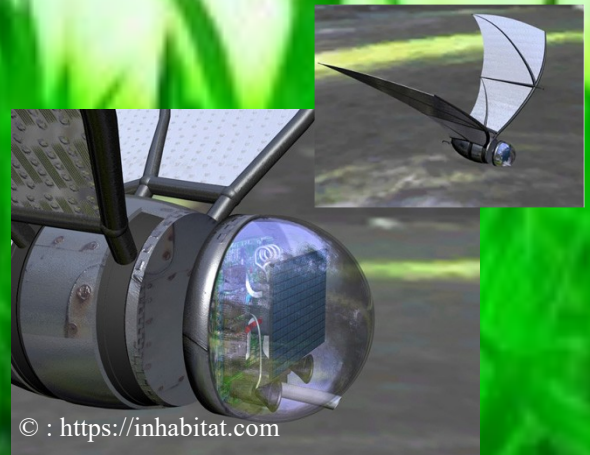
The first one is a bionic arm inspired by the elephant's trunk. It has been created by the German company *Festo*. This company is specialized in movements automatization systems using pneumatic or electric energies. This arm works just as an elephant's trunk that can be stretched in any direction to reach out and grab things but the end of this arm is a little bit different because it has four claws to pick up items. The picture on the left shows the similarities between the two trunks.



This beautiful bird named « Kingfisher » inspired Eiji Nakatsu, an engineer and JR West, a bird-watcher, to reduce the sounds produced by the train. They used their knowledge of the splashless water entry of kingfishers and the silent flight of owls to reduce the noise produced by the train. Kingfishers move quickly from air, a low-resistance medium, to water, a high-resistance medium, when they are fishing. The shape of the kingfisher's beak is ideal for such an impact. The beak is streamlined, steadily increasing in diameter from its tip to its head. This reduces the impact as the kingfisher essentially wedges its way into the water, allowing the water to flow past the beak rather than being pushed in front of it. Because the train has the same challenge, moving from low resistance open air to high resistance air in the tunnel, Nakatsu designed the forefront of the train based on the beak of the kingfisher.

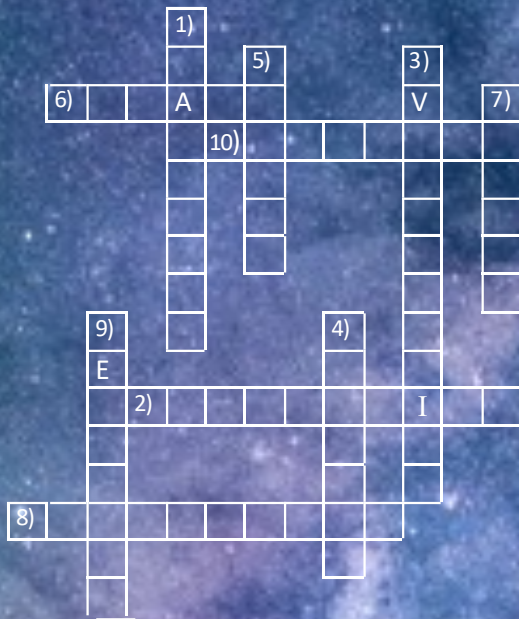


This one is very similar to the elephant's trunk but it has a different use. It has been created by the US military imitating bats. The aptly named COM-BAT is a six-inch surveillance device that is powered by solar and wind energy. This was conceived to collect real-time data for soldiers. The Army has awarded the University of Michigan College of Engineering a five-year 10 million dollars grant to develop it.



Have fun!

Game page



DEFINITIONS FOR CROSSWORDS

DOWN

- 1 : You have it in your hands
 3 : Injection to protect us from diseases
 4 : Part of time that comes after the present
 5 : The solid element that supports living things and where plants grow.
 7 : It is not big
 9 : This magazine is written in this language.

ACROSS

- 2 : Environmental destruction
 6 : It consists of planets and stars
 8 : Fossil reptile of the secondary era
 10 : It can be found in a zoo or in nature

J	O	L	I	O	T	F	O	V	C
A	Z	E	R	T	Y	U	I	I	O
V	E	M	O	T	A	S	F	C	L
D	T	E	G	F	D	I	Q	E	P
A	A	D	H	K	T	L	M	B	S
N	M	E	J	N	X	W	R	E	E
G	I	C	E	E	C	V	E	R	A
E	L	I	Q	X	E	B	A	G	D
R	C	N	J	S	L	N	D	F	G
S	N	E	L	E	M	E	N	T	S

WORDS TO FIND IN THE GRID

ATOM
 DANGERS
 ICEBERG
 MEDECINE
 OIL
 SCIENTIFIC

CLIMATE
 ELEMENTS
 JOLIOT
 NEWS
 READ
 SEA

Are there more risks during surgeries performed by humans than by machines?

YES NO

Is Hypocrate important for medicine?

YES NO

How old is the Apollo 12 mission?

65 50 43

Binge drinking has neurological consequences?

YES NO

Melting ice is responsible for floods?

YES NO

ANSERS IN THE RIGHT ORDER:
 No/ Yes /50/ Yes /Yes

THE EFFECTS OF POLLUTION ON OUR BODY

In our atmosphere, the sources of pollution are multiple, indoor and outdoor.

Indoor, mold, carbon monoxide, tobacco smoke and formaldehyde are the main sources of pollution that have an impact on your health and your body.

Outdoor, it is the benzene, sulfur monoxide, nitrogen dioxide, ozone and hydrochloric acid from industrial operations that hurt you.

As you know, air pollution is dangerous of us, humans. Our body is not made to fight with elements of these types. All this pollution can enter in the human body by the skin, the eyes, the nose, the ears and the mouth. All this disrupts human health, cause serious problems on the long term and can cause death.

Respiratory system

When toxic pollution enters the system, the results can be devastating. When toxic particles come in the organism they cause damage to the lungs and blood circulation. It can create asthma or cause allergies. When you are exposed to pollutants for a long time, this can trigger diseases, create tissue damage and in the worst cases, cancer. The most dangerous particles are those of tobacco which is the main risk factor for lung cancer. The particles emitted by the exhaust pipes of diesel engines have also demonstrated their carcinogenic potential.

For children, various environmental factors are suspected in the development of leukemia. Several studies have suggested the possibility of a link between living near a busy road and the occurrence of this type of cancer.



Circulatory system

Our circulatory system is the most important part of our body because it supplies the whole body with oxygen, nutrients and it regulates the body temperature and immune response with blood.

Exposition to benzene is responsible for leukemia cases. Carbon monoxide, nitrogen oxide, sulfur dioxide, lead and ozone can provoke many diseases such as cardiac arrhythmia, arterial constriction, abnormal inflammatory responses and heart diseases. All these substances increase the risk of death.



www.thoughtco.com/circulatory-system-pulmonary-and-systemic-circuits

Reproduction

Pollution is very dangerous for the reproductive system: Fertility is reduced and miscarriages increased by exposure to air pollution.

During pregnancy and early childhood, pollution can be the cause of critical pregnancy, rapid cell growth occurs in the fetus and severe malformations are the consequences of an exposition to pollution. The pollution can be absorbed by the mother and transmitted to the fetus. At birth, the baby can be premature, and have congenital heart defects, or malformations of the brain and spine.



www.theguardian.com/environment/ng-interactive/2019/may/17/air-pollution-may-be-damaging-every-organ-and-cell-in-the-body-finds-global-review

These deadliest weapons are invisible because they are smaller than molecules. The human body system tries to fight but it already fights against natural dangers and this is too much for it. It is powerless against these invisible killers. So be careful !