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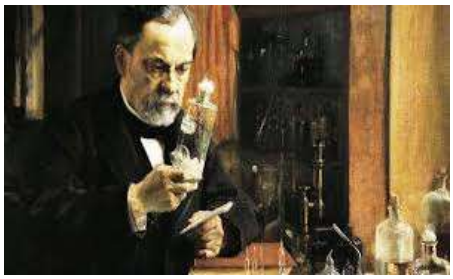
VACCINES (part 1/3)

L. Pasteur and the first human vaccine



Louis Pasteur in his laboratory

For this first part of the Gazette, we propose to learn more about vaccines by introducing Pasteur and the first human vaccine.

Louis Pasteur is a French scientist, specialized in chemistry and microbiology (science of microbes). ... He was born in 1822 in Dole (Jura) and died in 1895 in Marnes-la-Coquette (Seine-et-Oise). He is best known for having invented the first rabies vaccine.

Louis Pasteur followed a classical school path, and after he passed his baccalaureate degree in sciences, he become a scientist.

Before 55 years old, he is interested in disease research. He discovers vaccines against the cholera of the hens, against the charcoal and the mullet of the pork.

In 1885, Louis Pasteur created the first human vaccine. It works with weaken virus (The bacteria are not strong enough to kill or make the person who is vaccinated sick but they are sufficient to develop antibody).

When you get vaccinated, you are protected against an illness. It can enough be for your whole life or, sometimes, you have to do the vaccine again to continue to be protected.

The first human vaccine was against rabies. It's a disease concerning every mammal including humans. It's an inflammation of the brain and there are some easy symptoms to recognize : violent movements, unusual fear of water, uncontrolled excitement, paralysis, loss of consciousness.

Joseph Meister, first vaccinated man

On July 6, 1885, Joseph Meister, a 14-year-old Alsatian bitten by a rabid dog, arrived at Louis Pasteur's laboratory. The vaccines tested on animals seemed to be working well, but he is a human being and not an animal. It is decided to try the vaccination of Joseph Meister. Rabies is a disease that takes just over a month after the bite to develop.

The experiment is successful and the teenager does not catch rabies. Soon, other people came to Pasteur to get vaccinated, the news spread. After the large number of patients, France creates the Pasteur Institute, for vaccine research.

Clara PANNETIER and Lina MARMIGNON-QUESNE

Coronavirus vaccine? What type of vaccine and for when?

Vaccines typically require years of research and testing before reaching the clinic but scientists are currently trying to race through research to find a vaccine effective by next year. Work began in January but results are yet to be approved.

There're multiple phases when creating a vaccine, they begin by testing their vaccine on cells and then on animals like mouses or monkeys to study their immune response, this is called preclinical testing

Coronavirus is a highly contagious virus present in France since the end of 2019. To fight against this pandemic, many laboratories are trying to find a vaccine in record time. Normally, it takes about ten years to make a vaccine available for sale. However, some U.S. laboratories and others hope to find a vaccine against coronavirus by the year 2021.

Vaccines are pharmaceutical products designed to stimulate the immune system to specifically target and eliminate a pathogen. When you look at the contents of the syringe, you can see that there are many ways to achieve this goal.

Vaccines without any infectious agents have emerged with the development of genetic engineering and molecular biology. They are based on the injection of a protein, toxin or a pseudo-viral particle created from scratch.

Pfizer's Covid-19 vaccine uses a very recent version of the infectious agent-free messenger RNA vaccines. The immunogenic characteristics of RNAs were only discovered in the 1990s. The first applications of this technique were in cancer with the first clinical trial conducted in 2002.

This technology is still the subject of much research. At present, no messenger RNA vaccine is commercialized for human health use. Several are in clinical trials, including the Pfizer trial.

It would appear that mRNA vaccines hold great promise for treating infectious diseases for which no vaccine yet exists, such as Covid-19, but also cancer. Pfizer's vaccine, if fully licensed, will be the first to be licensed for human use.

BENEFITS :

- Large scale, low-cost production that is not a problem with current technology.
- The mRNAs have a very low half-life and are easily degraded. They do not interact with the genome, their uptake by the cellular machinery takes place exclusively in the cytoplasm unlike another type of vaccine in development, DNA vaccines.

DISADVANTAGES :

- Linked to a lack of scientific hindsight on its use.
- Clinical studies have reported grade 3 adverse events, i.e. totally incapacitating or life-threatening, for two mRNA vaccines.
- The fragility of messenger RNA is also a handicap. Pfizer has announced that its vaccine will need to be stored at -80° C. This poses obvious logistical problems. It will then be impossible to purchase its vaccine in advance and store it in the refrigerator before vaccination

Léa GARNIER, Amandine LANCLUME, Johanna HEURTAUX and Perrine SURIRAY

Crop Tops Flop

Since the start of the school year 2020, in France, some high school students, especially girls complained about the clothing restrictions in their high school. They can't wear what they want, and they think that's sexist. Many girls got kicked out of their school because of their clothes.To defend this right, they started a feminist movement. So, the 14th of September, high school girls wore clothes qualified as « vulgar » and « provocative » : crop tops, mini skirts, shorts, makeup... Some boys did it too to support them. This movement, launched on Tik Tok, has caused a lot of talk on social networks, TV news, and newspapers. It was relayed by Angele and other celebrities.

In response to these outfits, the french minister of education, Jean-Michel Blanquer, says that students have to wear normal outfits, called republican. But high school students asked: “What is a normal outfit?”. In the other hand, Marlène Schiappa, former minister of gender equality, claimed that she supported and admired them.

Administration and teachers also have different opinions. When some people agree with students, others say that this type of outfit is deconcentrating for boys. Others think that we need a happy medium.

Following this agitation, a lot of parents decided to speak with their children about the outfit they can wear at school. Unfortunately, it created some conflicts in the homes.

This movement echoes the day of the skirt (“Journée de la jupe” in French) in May 2006. During this day, boys and girls from a Breton high school wore skirts to encourage young girls who did not dare to dress in a skirt, because of the remarks that they received.

HERAULT Léane, CROISSANT Clara, RAULTCharline

“COIFFEURS JUSTES”

Indeed, one million people have their hair cut everyday by hairdresser, in France. The project “coiffeurs justes” was created by the hairdresser Thierry Gras who comes from Var.

The goal of this operation is to recycle hair that has been cut and finally will be thrown in the bin. For this, they develop the system of hair recuperation.

In partnership with hairdressers in whole France, they decided to create bags to stock them. Thierry agreed with the “Province verte” territory, to put containers in the city, to lay their hair's bags. Then, the bags are taken by lorries to be sent to factories.

The hair got many benefits. To begin, it's a ground fertilizer. It can insulate the walls in the houses or reinforce concrete. It's also used to filter the waters. For this principle with one kilogram of hair we can save two hundred litters of water. The hair can also filter hydrocarbons. This filtration involves long lines of hair's bags to stop the petrol. It enables prevent hydrocarbons to come on beach. This new way of recycling privilege the job's creation.

This principle is very enriching for population because handicapped persons work on this project with E.S.A.T (Établissement et Service d’Aide par le Travail).

This process contributes to the science development thanks to the keratin (abundant proteins which are in the hair and nails).

To conclude, two hundreds hairdressers environmentally responsible can recycling two thousands kilograms of hair and saving four thousands litters of water during one year.

ABBAS-CORBIN Naomi et FLAMBARD Lilly

The great elections of 2020

This year, takes place the 59th presidential elections of the United States, which opposes the Democrat candidate Joseph Biden and her vice-president Kamala Harris to the representative of Republicans Donald Trump with Mike Pence as vice-president.

The American presidential election is an election by indirect universal suffrage, it's why it unfolds in a very different way compared to France. First of all, from January to June 2020, there is an election in each state of the Great Electors. This event is called « Primaries ». After these six months, the national Convention of the Republican and Democratic parties takes place. In fact, during August, a candidate is chosen, in order to represent the best of his party and it is also the opportunity for candidates to present their program.
In order to win the elections, the two candidates lead an electoral campaign during two months. To encourage them to vote for them, they can make TV commercials in which each candidate criticizes the opponent, but they don't tell the people what their program is for the country. These spots are very expensive and can create inequalities between them. But they are not done in France, it makes a difference between the two electoral systems.
Moreover, the candidates debate on TV in order to defend their ideas and encourage people to vote for them. Each candidate's speaking time is sometimes regulated but the speakers have generally the right to take part in the discussion.
In November, the general election happens. During this period, American citizens vote for a great elector in each state. The election is therefore very stressful because people don't have the results the day of the election. The Electoral College Vote takes place in December, when each Great Elector votes for the candidate they support.

Finally, Joe Biden won the presidential election with at least 290 Greats Electors even if we don't have the final result of three states : North Carolina, Georgia and Alaska. He especially won California which has 55 Greats Electors and the state of New-York which has 29. His job came into effect in January 2021 and it is at this moment the candidate will move into the White House.

Clémence BLANCHET, Chloé BUIL et Sarah DRION

Big contestations against the Belarus's president Lukashenko

Who is Lukashenko ?

Alexander Lukashenko is the first and unique president of Belarus since his assumption of power in 1994. After the fall of the USSR in 1991, Loukachenko did everything he could to shame the Belarusian head of state Stanislaw Chouchkievitch. This one was accused of corruption and so Lukashenko became the first president after an election. He actually is the leader of Belarus since the country became a post-Soviet state. Lukashenko was born on 30 August 1954 in Kopys, a little settlement of the Byelorussian Soviet Socialist Republic which was a federal unit of the Soviet Union (USSR). He grew up without a father and it is maybe why he became the one we currently call "Europe's last dictator". He firstly worked as director of a state farm (sovkhoz) after which he served in the Soviet Border (1975-1977) Troops and then in the Soviet Army (1980-1982). He also led a Leninist Young Communist League (Komsomol) from 1977 to 1978, which was the communist youth organization founded in 1918 by Lenin.

Alexander Lukashenko

Lukashenko's past could explain why he is so conservative and authoritarian at the head of Belarus. It remembers the USSR, opponents are repressed, media are not free, and censorship is widespread… Insulting the president is punishable by up to 5 years in prison, and by criticizing Belarus, it is up to 2 years. If we currently hear that much about Belarus, it is because of the controverted sixth Lukashenko's election. The European Union, the US, the UK and more, do not recognize his 2020 election. It is nevertheless not new for Lukashenko to be in the spotlight… It began with his first election, as in 2020, he has been elected with 80% of votes, he also changed the constitution to have the ability to split the Supreme Soviet, he made a first mandate of 7 years instead of 5 years. In the end, he did everything to have the most important control of Belarus.

Since 2006 the US and EU imposed sanctions on Lukashenko for human rights violations. In 1995 Lukashenko said "not everything connected with that well-known figure Hitler was bad" in reference to how Lukashenko would have raised Belarus as Hitler "raised Germany from ruins". Accused of making anti-Semitic comments in 2007, he also said "better to be a dictator than gay" after being identified as "Europe's last dictator" by the openly gay German Foreign Minister during Brussels summit from 2012.

The actual belarussian flag

Why these contestations ?

The last presidential election took place on August 9th, and Lukashenko won this one (as the five others) with 80.23% of the Belarusian votes. Alexander Lukashenko did his best to win the election. He decided to incarcerate the leader of the opposition, Sergueï Tikhanovski. However, the dictator let Tikhanovski's wife, Svetlana Tsikhanovskaïa run for presidency against him. The 37 years old woman took her husband's place in order to lead the opposition. She lost the election but she is claiming the victory. After her defeat, the leader decided to go to Vilnius in Lithuania to escape from jail and repression and to be "more helpful for the Belarusian people". Like Tikhanovskaïa, Lukashenko's opponents think the results are fixed and some demonstrations started after the announcement of the dictator's reelection. During these protests, the opponents are marching with the former Belarusian flag which Lukashenko decided to prohibit and substitute by the Soviet flag. This movement is still in

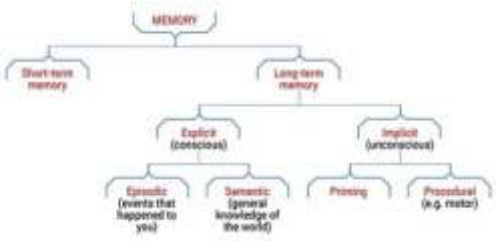
Opponents who are wearing the former flag

place in the country and on October 25th, Tikhanovskaïa said to the Belarusian people that he must organize a new national strike in order to put out President Lukashenko. Workers, employees, students but also shopkeepers answer to the call by going in the streets to protest against Lukashenko. In order to support this opposition and denounced Lukashenko's actions, the European Union decided on October, the 22nd, to deliver the Sakharov prize (a prize for people who fight for human rights) to "women and men of the democratic opposition in Belarus". The EU had also firmly disapproved the election of Alexander Lukashenko who hasn't the legitimacy to be president. The opposition is also a candidate to win the 2021 Nobel Prize of peace.

Svetlana Tikhanovskaïa, although exiled, is full of hope for her country and its political future. She said that she was satisfied by the mobilisation of the people and that shows that "it [the people] is ready to fight against dictatorship". According to her, the fear has switched and is now on Lukashenko's side. But, we have to say that these demonstrations do not happen without representations from police. For example, on October 26th, 581 people were arrested because they decided to stand with the opposition during a demonstration. And we have to remember that these people on the streets are risking their lives to access a decent political system.

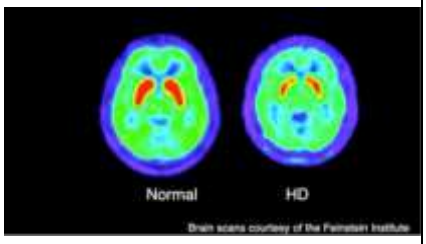
Quentin GUILLOUX and Erwan BONNEMAINS

Memory



The short-term memory only lasts 20 to 30 seconds, it dismisses or transfers informations to the long-term memory. The long-term is more complex than the short one. Everything that happened a minute ago would be stocked in. It's divided in to other types of memories. The explicit and the implicit ones. The explicit memory is the one which will help you to remember consciously. This memory is divided into episodic memory which is our ability to retain something in our lives (Our ability to retain episodic memories depends on how emotionally powerful the experiences were), and semantic memory which accounts for our general knowledge of the world (it declines slowly with age). After that, we have the implicit memory. It comprises memories that you don't have to consciously recall. For example, riding a bike or speaking a language. Even though it may require a lot of conscious thought while learning, at some point it became implicit and you did it automatically. Procedural memory is a type of implicit memory allows us to do certain tasks without thinking about them. Besides riding a bike, it also includes tying a shoe, brushing our teeth, or driving a car.

Memory diseases



There are 2 types of memory diseases. The first one is progressive (like Alzheimer's disease) or not (like a head injury). There are 10 ABI (Acquired Brain Injury) recognized today. The most known is the Alzheimer's disease but we also know the Parkison's disease which causes memories trouble. But there's other types of memory injury like dementia, amnesia or the Huntington's disease. This one is an inherited progressive disorder of the brain that leads to uncontrolled movements, emotional instability, and loss of intellectual faculties.

Memory and Actuality

In November 2020, an old ex-ballerina with Alzheimer called Marta Gonzalez danced on the known ballet of Tchaïkovski, the Swan Lake. She remembered all the choregraphy while she forgot everything.

Some searchers found a molecule that can slow down the Alzheimer and the Parkinson's disease. In the USA, a laboratory found a medicine that can help to be healed of the Alzheimer's disease. In few years, searchers should find how to stop definitively this disease.

LEJEUNE Manon and HARIVEL Paul.

Tell me why is the brand new video game by the studio Dontnod Entertainment, creators of the amazing franchise Life is strange. It was released between September and August 2020 in 3 chapters (1 every week) on Xbox one and pc.
This game, like Dontnod's previous ones, is a narrative adventure game with a complex scenario, combining reality and supernatural/fantasy, with attaching and realistic characters. It deals with current themes such as trans identities, mental health, or mourning. His graphic style is really good, gives the game a very contemplative aspect, along with an excellent soundtrack.

Tell me why is about two twins, Alyson and Tyler (previously Ollie), meeting for the first time, 10 years after Ollie confessed the killing of their mother in self-defense. During those 10 years, Alyson was adopted by the Delos Crossing Chief of Police. While Ollie was placed in the Fireweed Detention Center where he made his transition (his name is now Tyler). They met in Delos Crossing, a small town in Alaska, to clean their childhood home before selling it. But returning to the place of the tragedy brings back memories and traumas. The twins begin to search for information about their mother's past as well as the past of the town's inhabitants to finally understand what happened the night their mother died and why did it happen.

Tell me why sets up different gameplay: the twins can revisit their memories and the player can choose which version of a memory he wants to believe (between the twins), the player also choose the dialogues of certain characters as well as many other actions that may seem small but at the end, all these choices will impact the course of the game (dialogue, relationship between characters, action, ending...). The player will also have to solve more or less complex puzzles to advance in the story.

Personally, I found this game pretty good but not up to the level of Life is strange 1 and 2, the story was less engaging, the supernatural side was not exploited enough, some parts seemed really long and the dialogue where a little off sometimes. Apart from that, I advise it especially if you like to create your own theory or simply if you like narrative games.

Candice NOUVET

Beautiful discovery at Saqqara

At the end of September, 59 sarcophagus, a vat reserved to receive a body or a coffin, were discovered next to the Djéser's pyramid in the necropolis of Saqqara. The sarcophagus date back to the VIth or VIIth century before Christ, in the XXVIth dynasty of ancient Egypt, so they have nearly 2500 years. The necropolis is actually the one of Memphis, the capital of ancient Egypt and it's a site of the UNESCO.

They found the sarcophagus in a well and they are perfectly preserved. The archeologists think the discovery is not ending and many other things can be unearthed. The burials are decorated with many hieroglyphs and colorful drawings. They are made of stone and the most expensive are silver or gold plated. In the sarcophagus, 2,700 year-old mummies were found in very good condition and were accompanied by mummified animals (beetles, snakes, birds,...). According to the texts on the sarcophagus, the mummification gives an eternal life beyond to the deceased. They're pulling the entrails and the brain, and then they filled with plants, tar and bitumen. This operation was only made on the rich and the Pharaohs. The inhabitants of ancient Egypt gave offerings to their Pharaohs and a lot of sarcophagus were robbed for this treasure.

These are not the only discoveries of sarcophagus in this region but it's the first historic discovery since the beginning of the world pandemic and Egypt hopes that finding will restart the tourism of the land. The sarcophagus will be exposed in a new museum which opens in 2021.

Cassandre YON-TAILLEUX,Camille DE LA LOSA

Mohammed VI offers a mansion of 1,000 square meters at the foot of the Eiffel Tower

The king of Morocco now has a huge mansion just a stone's throw from the Iron Lady. Its price 80 million euros.

However, this information has upset some Moroccans as the king asks them to make efforts in the midst of a health crisis. Indeed, the monarch is the owner since 1972 of Betz castle, located 75 kilometers from Paris. So he decided to treat himself to a Parisian hotel near the famous Eiffel Tower.

The rich hotel that now belongs to King Mohammed VI is located at 20, avenue Emile-Deschanel, in the 7th district of Paris. It should also be noted that the king bought it from Prince Khaled ben Sultan ben Abdelaziz al-Saoud, a member of the Saudi royal family

The latter is a former Deputy Minister of Defense in Paris, who knows Paris well. Yet this incredible purchase does not make the Moroccan people happy. Indeed, the king asked the Moroccan people to be more careful in the face of the health crisis currently affecting the country. He made a speech on the day of the Throne Day in Morocco showing circumstances of the Covid-19 on the country and that it was necessary to be more responsible, but behind all these words the king bought himself a luxury hotel in the middle of Paris.

Hotel bought for 80 million euros by King

Mohammed VI

Chirine BOUROUD

SCHIZOPHRENIA

Schizophrenia is a psychiatric disorder characterized by continuous or relapsing episodes which is abnormal condition of the mind that result in difficulties determining what is real and what is not real. Major symptoms include hallucinations, delusions and disorganized thinking But there are others symptoms like social withdrawal, decreased emotional expression and apathy.

This disease appears in many cases in young adulthood and there is no diagnostic test to overcome it. Moreover any people with schizophrenia have other mental disorders like anxiety, panic, obsessive-compulsive disorder or substance use disorder.

About 0,3% to 0,7% are affected by schizophrenia during their lifetime. In 2017, there were 1,1 million of new cases and in 2019, 20 million. Specialists say that men are more often affected than women. Be affected by schizophrenia can be because of genetic or environment factors like: cannabis use during adolescence, poor nutrition during pregnancy… Schizophrenic people have higher suicide rate than "normal people" and their average decreased life expectancy is about 20 years.17,000 is the number of deaths estimated caused by schizophrenia in 2015.
The main treatments against schizophrenia are antipsychotic medication, social rehabilitation and job training.

A lot of famous people were affected by this disease like John Nash, a mathematician who get the economic Nobel Price or Syd Barrett, a musician from the group named Pink Floyd.

Painters like Van Gogh for example were schizophrenic to. "The Starry night" would be a proof of his hallucinations. We also can take the example of Louis Wain, an other painter very famous thanks to his canvas which represent cats. He was just 50 years old when he was diagnosed schizophrenic, in 1910.

Floriane MASCRE and Lilou MORTELIER

What is the secularism?

Since the Samuel Paty's assassination on October 16th 2020 the notions of freedom of expression and secularism are in every discussion. But do we really know what secularism is? According to its definition, secularism is an organisation of the society in which the Church is separated from the State. So, these two actors do not interfere with each other. But we forget that this concept can take several forms. In fact, a secular government is a state that does not intervene in religion; thus, everyone can decide to be a believer, an atheist or even to change religion during his life without suffering consequences inflected by the state. Moreover, the principle of secularism offers equality between all citizens regardless of their beliefs. Finally, everyone is free to expose their beliefs in the public space (while respecting several principles of respect and legality).

However, secularism at school is more complex. Indeed, teachers being public service people have not the permission of showing any religious affiliation, but they can speak about religion in the context of teaching. As for pupils in public schools, colleges and high schools, since 2004, they too are forbidden to wear signs or dress ostensibly showing their religious affiliation, but they can wear discreet religious signs like earrings for the young girls.

So, we can say that even though the principle of secularism is a difficult principal, there remains a principle that allows everyone to express their opinions and retain a form of freedom.

Tiphaine ANDRIEUX

Bergen

Bergen is the second largest city of Norway, after Oslo, the capital. It is located on the west coast of the country. The city and the municipality stretch over 465 square kilometres (or 180 square miles). There are 278 121 inhabitants.

At the beginning, the town was called “Bjørgvin”. “Bjorg” can be translated by “mountain” and “vin” by “pasture”. The world “Bergen”, in German, means “mountain”. The king Olav Kyrre created this city in 1070. It became the capital of Norway in the 13th century. In 1299, the king Haakon V spent a lot of time in Oslo and stayed there. He thought that Bergen was too far from other Norwegian cities in which he had meetings so he declared that Oslo would be the Norway’s capital.

Bergen is surrounded by seven mountains, called “De syv fjell” in Norwegian. These mountains are next to the several fjords. Today, in Bergen’s seal, a castle in engraved above seven hills which represent seven mountains. These mountains are symbolized by seven points in many buildings in the town. The most famous with its funicular is Fløyen, on the north side of Bergen, and the highest with an altitude of 643 meters is Ulriken.

In Bergen, we find an oceanic climate because winter is not really cold and summer generally mild. The town is called “the rain’s city”,or the European Seattle” because of the rain. Indeed, between 2006 and 2007, Bergen’s citizen knew 85 days consecutive of rain. It could be compared with our Normandy. There is a funny Norwegian quote which says “every Norwegians are born with skis on their feet except Bergen’s citizen who are born with an umbrella”. Although, it is one of the Norwegian cities where it snows the least.

In Norway, there are two dialects: the Bokmål, which is used the most in the country and which comes from Danish; the Nynorsk, which is spoken by only 15% of the population. Bergen didn’t choose one of the Norwegian dialects for its first official language. However, the city created its own dialect: the Bergensk. Its lexicon, semantic and syntax are inspired by German. It is the only Norwegian dialect in which there are two grammatical genders, feminine gender doesn’t exist! In the pronunciation, “r” is rolled in all cities of Norway while “r” is similar to French with Bergensk. Every Norwegians are able to understand the Bergen’s dialect.

Clémence LEVAILLANT, Léo GUERARD et Quentin BEZIAU

Norway

Norway is a Nordic country in Northern Europe. Norway is

bordered by Atlantic Ocean and Arctic Ocean.

The country is ruled by Harald V as a constitutional monarchy. Norway is populated by more than 5,433 million inhabitants of whom more than 680 000 live the capital, Oslo. The national day is the 17 May 17. Norway is one of the richest countries in the world and is considered asthe most democratic country in the world. The official languages are two dialects of Norwegian, Bokmal and Nynorsk. The official currency is the Norwegian krone (NOK).

Norway map

The border countries of Norway are Sweden, Finland and Russia.

The flag :

In Norway ,blue,white and red represent democracy :
these colors are reminiscent of the flags of the United States, United Kingdom and France

César URSIN, Robin REINERT and Matéo BONNESOEUR

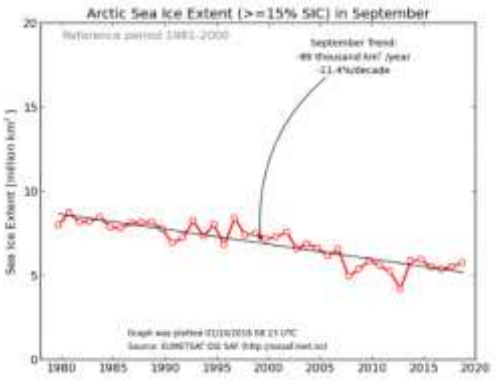
MELTING ARTIC ICE

The quick decrease :

During this time of the year the ice floe is at its lowest surface area. Some researchers have done research to see the evolution of the ice floe every year and mainly about it expansion. They compare the facts of 1981 to 2010 to those of 2020 and they found many interesting things. Between the period of 1981-2010 and now the expansion was divided by 2 and the melting rhythm is clearly faster than the initial forecasts.

Causes :

The global warming increase this phenomenon cause it reduce the thickness that speed up the melting.



Statistics :

Surface area :
- 1981-2010(average) : 6,3 million km^2
- 2020 : 3,74 million km^2

Clara BESNARD

The relation of Physics to Chemistry

Physics is the most fundamental science, it has had a profound effect on the development of the other sciences, and plays a basic role in all phenomena.

First of all, chemistry is deeply affected by physics, which deals with inorganic chemistry at first (the chemistry of not living things). Early chemistry and physics were connected because of the theory of the atoms which was substantiated by chemical experiment. As a matter of fact, the knowledge of chemical reactions was summarized to a large extent in the periodic chart of Mendeléev, which brings to light the relationship among the elements. Also, this chart reveals many rules, as to which substances are combined with which. All these rules are finally explained by quantum mechanics, thus the theoretical chemistry is in fact physics too. However, as if we could know all the rules it must still very complicated to predict what will really happen in a given reaction.

As a response against this lack, there is a branch of physics and chemistry that was developed thanks to both sciences: The statistical mechanics.

We know that each chemical situation involved a large number of atoms, which are jiggling in a very random and complicated way. Thus in theory, if we can analyze each collision of each atom and their movements, we might hope to predict what would happen. Nevertheless, this is impossible, because we do not have any system which can completely describe these phenomena yet. But statistical mechanics or thermodynamics (sciences of phenomena of heat) can analyze parts of these chemical situations.

Therefore inorganic chemistry is reduced to the physical chemistry which studies the rates at which reaction occurs and what is happening in detail likes the collisions of molecules and the other changes occurrences. And to the quantum chemistry which helps us to understand what happens in terms of physical laws.

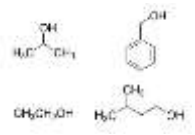
Finally, in the organic chemistry (the chemistry of living things) we find the same kind of substances, but more complicated arrangements of atoms are involved. Organics chemistry is obviously deeply connected with biology which supplies its substances. Actually, we can apply physical chemistry and quantum mechanics to organic compounds as to inorganic compounds. However, the main problem with the study of organic substances is rather the analysis and synthesis of these in biological systems.

Willem BABE and Simon TRAVERS

Effects of Alcohol

The alcohol is one of the worst or best vice of human being, It depends of the point of view. The alcohol may be a really good drink when you're with your friends or in a party. But alcohol has some bad effect on your body. In this article we will explain you what are the dangers of alcohol on your body.

So first it's important to explain why we get drunk when we drink alcohol.



1.The alcohol in alcoholic beverages is constitute of small molecules of ethanol (CH_2CH_3OH). These are able to pass through the walls of the digestive system (stomach and intestines) to enter directly into the circulatory system. It takes about half an hour for alcohol to fully invest the body and reach the brain. At this point, the alcohol molecules attach themselves to some of the receptors that control neuronal activity. Finally your neuronal activity is boost or scaled down. The cells responsible for movement and language, in particular, get confused and we are drunk.

2.Next it's important to talk about different damage that alcohol can create. Drinking too much alcohol can cause abnormal activation of digestive enzymes produced by the pancreas. Buildup of these enzymes can lead to inflammation known as pancreatitis. In a long-term pancreatitis can cause serious problems like respiratory problems.

Alcohol also increases your risk for chronic liver inflammation and liver disease. The scarring caused by this inflammation is known as cirrhosis. The formation of scar tissue destroys the liver. As the liver becomes damaged, it becomes difficult to it to removing toxic substances from your body.

One of the easiest ways to understand alcohol's impact on your body is by understanding how it affects your central nervous system. Slurred speech is one of the first signs you've had too much to drink. Alcohol can reduce communication between your brain and your body. This makes coordination more difficult. You may have a hard time balancing. You should never drive after drinking.

Finally, you probably think drinking alcohol can reduce your inhibitions and help you to get more fun in bed but that's not the reality. It can create some problems like erectile dysfunction. It can also reduce the production of sex hormone and libido. It will be stupid not to have some fun just because of alcohol, isn't it?

In conclusion the alcohol is something good but with low quantities and be careful of the dependency!

Martin LEBOULANGER, Mathieu NICOLLE, Clément AUVRAY

Is there life on Venus ?

Recently, the presence of phosphine has been discovered on Venus and it could be a life signature.

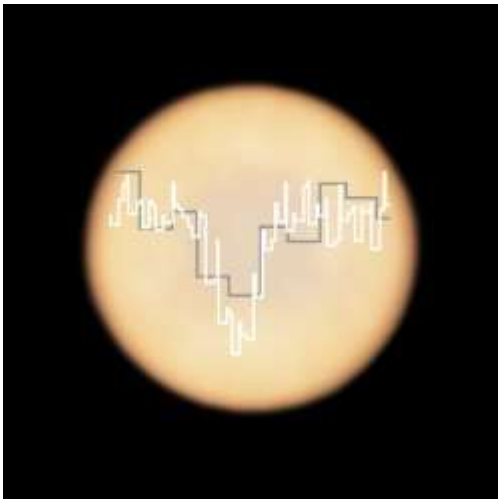
First of all, the PH_3 (phosphine molecule) is extremely rare on rocky planets because their atmosphere is composed by a lot of oxygen. The atoms of oxygen in the atmosphere will try to associate themselves to the phosphor atom of phosphine and this way destroy the molecule and free the three hydrogen atoms. So even if there is a phosphine production inside of the planet, when it arrives in the atmosphere, it should be destroyed.

Despite it all, we can find phosphine in the Earth, but only one nanogram per meter cubed. On Earth, this concentration of phosphine would be due to bacteria biologic process. Because of that, we can think that phosphine on Venus is a proof of life ! But this is not that simple. A lot of mistakes could have been done during the observations.

The way the phosphine has been seen is using spectroscopy. It is a method of analysis of the light emission of an object. Each molecule absorbs a specific wavelength of light and we can see that signature on the spectrum of Venus. A mistake in the spectrum, or during the analysis of this one, during its reconstitution because of the perturbations due to the Doppler effect, can be different explanations of the presence of phosphine. So the scientists searched for molecules with similar absorption spectrum, but no one exists. They did other measures with other telescopes in the world and there was no error. So they concluded that phosphine is really a part of Venus atmosphere, and in a big quantity (20 000 times more than on Earth).

But is it due to life, as it is probably on our planet ? The question here is to observe where they found PH_3. Because the conditions on Venus are really hostiles to life. More than 450°C, a pressure almost a hundred times the one we have, sulfur in the atmosphere… But at forty or fifty kilometers, in the clouds, where a lot of phosphine has been detected, the temperature falls to approximately 30°C and the pressure at only 0.5 bar, half of the Earth pressure. Conditions acceptable for life regardless of course of the hyper-acid character of the atmosphere.

To conclude, maybe there is a form of life high in the clouds of Venus, or it could be the fact of unexplained chemistry made by unknown reactions, volcanoes, or a fallen meteorite that brought phosphine when crashing on Venus. But the most interesting is that if there is life as close as Venus is, maybe the entire Universe is full of forms of life, resistant to sulfur and acid conditions and it is an extraordinary perspective.



Superposition of Venus and the phosphine molecule absorption spectrum lines (in White ALMA telescope and in grey JCMT telescope)

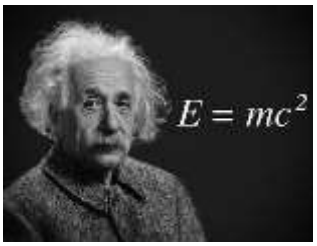
Amélie DE LA LOSA, Maëlla FRITSCHE and Valentine ABAVENT

The energy of the stars

Without the sun's rays, earthly life would simply be impossible. Aware of this role, many civilizations have deified the sun.

Stars constantly emit an energy that seems almost infinite. They do not consume energy like a fire or a battery, but they produce it Where do they get such energy? Their mass! They simply convert mass into energy. Quite simply, but in a rather stunning way if we have admitted that the world is divided into two separate and opposite parts: matter and energy...

1. Mass-energy equivalence:



Before Albert Einstein developed relativistic physics, matter and energy were considered to be two well-separated domains. Today, we know that matter is transformed, under certain conditions into energy!

That's what the E=mc2 equation reveals. y this famous formula, Einstein showed that mass is the result of interactions between the constituents of matter. When one changes the E energy of a body, one changes its mass m and vice versa. Mass and energy are linked: we speak of mass-energy equivalence.

In this formula, the constant c corresponds to the speed of light in the vacuum (299,792,458 m/s or about 3 .10 ^{8} m/s or 300,000 km/s). So we see that a very small amount of material can potentially release a huge amount of energy

2. Release of energy during a nuclear reaction:

The mass transformation into energy occurs particularly during nuclear reactions. During a nuclear reaction, the number of nucleons is preserved but the mass of the resulting products is less than the mass of the reagents. The missing mass Δm is called "mass defect". It corresponds to the following released energy $E_{released}$:

$\Delta m = E_{released} / c^2$

where the released energy is expressed in joule (J); mass loss in kg: and the speed of light in the vacuum c in $m.s^{-1}$

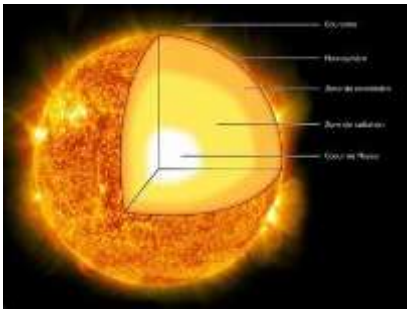
3. The sun, a nuclear reactor

Scientists questioned for centuries the source of energy that allowed stars to shine for so long. scientists questioned for centuries the source of energy that allowed stars to shine for so long. The solution was found in the early 1930s: our star is the site of nuclear fusion reactions that consume hydrogen to form helium. The solution was found in the early 1930s: our star is the site of nuclear fusion reactions that consume hydrogen to form helium.

It was the American astronomer Charles Critchfield who proposed the details of the process, which involves a succession of several nuclear reactions. They can be summed up according to the balance sheet:

$$^{2}_{1}H+^{3}_{1}H\rightarrow^{4}_{2}He+^{1}_{0}n$$

These fusion reactions, which take place in the heart of the star, are accompanied by the emission of photons. because of the extreme density of the sun, they take several million years to reach the surface of the sun, called photosphere. It is the photosphere that is the "visible" part of the star. The temperature of the heart, occupying about a quarter of the radius of the star, is in the order of 15 million degrees.

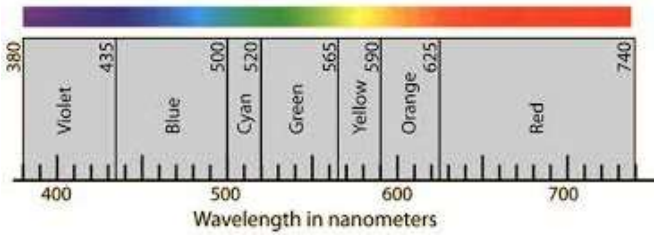


Charlotte PAYSAN, Noémie LOUAIL, Maylie BEAUMONT

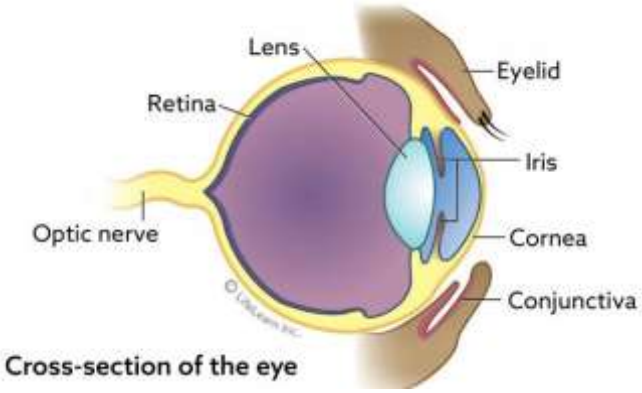
Why do we see colors ?

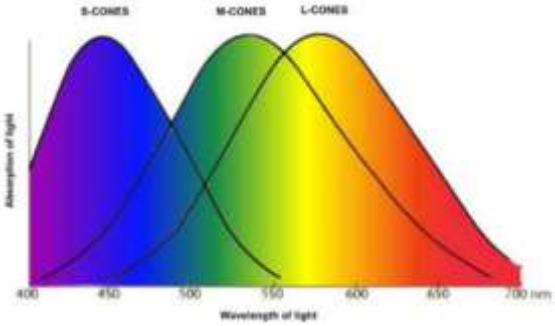
First and foremost, to perceive any color we need light, but what is light ?

Light is made up of photons but it is also a wave whose visible range extends for us from 380 to 740 nano-meters. This wavelength of the light determines the color of a perceived object. Below 380 nm, it is ultraviolet and above 740 nm, infrared.



In our eye, more precisely in the retina, we have 120 million rods, cells that are sensitive to the absence or presence of photons. They are therefore sensitive to weak light but not to wavelengths. However, we also have 5 million cones. These cones photoreceptors contrary to rods, are sensitive to wavelengths of light. It is thanks to them that we perceive the colors.





The “S cones” are mainly stimulated in short wavelengths (like the blue wavelength), the “M cones” in the averages/medium (like the green wavelength) and the “L cones” in the large ones (like the red wavelength). Depending on which cones will be stimulated, the brain will interpret different colors, for example: 435 nm for blue and 740 nm for red. When the wavelengths perceived by the cones overlap, the brain generates additive synthesis which creates the other colors of the spectrum, which is why we only need 3 different types of cones. To sum up, this whole mechanism made up of rods and cones, constantly transmits information via the optic nerve which allows the brain to create color sight.

Diego BOURBON and Elfège LEGROS-GHALALA

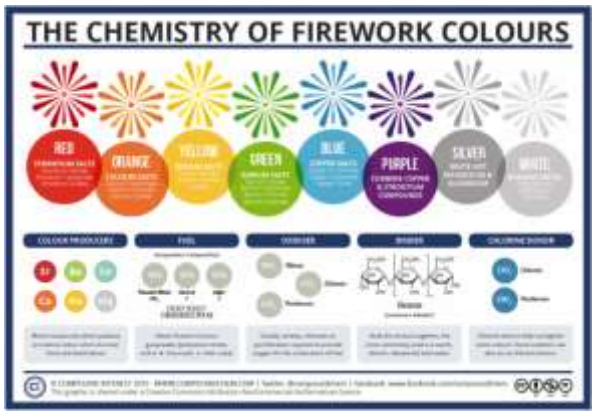
1 day, 1 movie :
Spirited Away

Spirited Away (also called Chihiro's travel) is a movie written and directed by Hayao Miyazaki in 2001. It is an anime movie which is really famous in Japan. It's an adventure, fantasy and a drama movie. One year after his release, Hayao Miyazaki won the Oscar for the best animation movie : it is an important succes for the japanese.

Plot : This movie is about a little girl named Chihiro who is going to her new house with her parents. Following a long trip, they make a wrong turn and arrive somewhere unknown. The family finally saw a tunnel and decided to go in. Sometime later, they visited a mystery place and unfortunately, Chihiro's parents were tranformed into pigs ! She has no choice, Chihiro has to save them. For this difficult task, she takes a job in a bathhouse with Yubaba, a witch who can save her parents. Chihiro will have to be brave before returning to her previous life.

Lola CHESNEAU

What is a firework ?



Fireworks, these events that are liked by adults or children. These devices that we use to celebrate the holidays. Their explosions of lights amazed the whole family. Today you will know the history of their creation and how they work. The fireworks work thanks to the powder, imported from China by Marco Polo around the 8th and 9th century, it is composed of several elements allowing these explosions. The oxidizer, providing the oxygen necessary for the combustion of the fuel, which will ignite and explode. The powder used for fireworks is composed of potassium nitrate (NKO3), the oxidizer, carbon (C), and sulfur (S), the fuels.

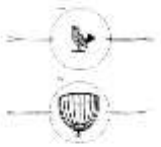
The powder ignites when we light the wick, the following chemical reaction then occurs: "chemical reaction that I put in the other". The escape of gas and energy created by breaking the bonds between atoms and creating new bodies. This powder is also used at the top of the rocket to detonate the hull and ignite metals. First used to make weapons and bombards it was then used as entertainment. The appearance of the term fireworks was first used to describe the flames used in shows to show that they were not natural, for example to imitate the fiery breath of dragons. In France, the first fireworks as we know it today were used for the wedding of Anne of Austria in the company of Louis XIII.

Maël CAUCHARDand Alexis DAVID

The fabulous history of cinema

Cinema officially appeared at the end of the 19th century, more precisely in 1895. Many researchers have long tried to give movement to images in order to represent life, while relying on advances in photography, all techniques, methods and materials for recording what has been imagined visually and/or as a result of a visual stimulus that appeared in the 1820s, and human biology. Joseph Plateau (1801-1883), a Belgian inventor, discovered in 1829 that the retina memorizes an image longer than it sees it. The principle of "retinal persistence" gives the illusion of movement when the eye is subjected to 12 frames per second. Today, for better image quality, films in the cinema use 25 images per second, unlike silent cinema, where there were only 16. Plateau designed in 1832 the Phenakistiscope. It is an object that represents the first step towards the invention of the animated image, and therefore of cinema, a few decades later…

Then followed the Thaumatropic, an optical toy that exploits the phenomenon of retinal persistence; the Phénaskistiscope, an optical toy that gives the illusion of movement attributed to retinal persistence; Zootrope, an optical toy invented simultaneously in 1834 by William George Horner and Simon Stampfer. Based on the retinal persistence and the phi effect, it gives the illusion of movement of an animated character. The Praxinoscope, invented in 1876 by Emile Reynaud, patented in 1877, is an optical toy giving the illusion of movement and operating on the principle of optical compensation. Finally, the Kinetocsop. It is the oldest device in the history of cinema, intended to visualize photographic works giving the illusion of movement, the films recorded by this camera, which exceed in duration the cyclic rotation of the optical toy (limited to two seconds) and can thus reach a few minutes.



The Thaumatropic

The Phenaskistiscope

The Zootrope

The Praxinoscope

The Kinetocsop

It was two French brothers, Auguste and Louis Lumière, who were the first to find a device to capture the images and the projects at all. Louis had the idea to draw inspiration from the mechanism of the sewing machine. In March 1895 they patented their invention, which they later called the «cinematograph», from the Greek Kinema (movement and Graphein: writing). The first public screening of the cinematography took place on December 28, 1895 in Paris and thus marked the official birth of the 7th art. That evening, in the basement of the Grand Café, about thirty spectators paid a franc (about 3.50 euros nowadays) to watch 10 films of about one minute each. The first film, called *Out of the factories* shows the workers and employees of the two brothers, owners of a photo equipment factory. These workers were leaving their factory. The success was immediate.

From about 30 people on the first day, we move to hundreds of people on the days following the screening— The room was full and the tails were endless. There were more than 18 screenings a day. These screenings started at 10 o'clock in the morning.

Georges Méliès, magician and director of the Houdin theatre in Paris, was captivated by this discovery. He was one of the first 33 spectators and wanted to buy a copy of the Cinématograph immediately. But the Lumière Brothers refused to reveal the secret of their discovery. They did not want to disclose the secrets of their invention. Counterfeits and the history of cinema began…

The Lumière Brothers

The Cinématograph

Clara RICHARD

The cinema point.

The November 12th of 2021, the Wizarding Word will come back to the cinema for the third opus of "The fantastic beats"!
Because of all the recent events in the muggles' world, the film's release date was pushed from November 2020 to one year later, November 2021. the movie should release the month and for this occasion I choose to write an article about the incredible writer of all the Wizarding World: J.K Rowling.

J.K Rowling, with her true name Joanna Rowling was born in 1965, so she's 55 now. She studied at the university of Exeter in England and in La Sorbonne in France. She became famous with her magic book: *Harry Potter*, which was translated in 80 languages and sold in 500 million copies.

The story of Harry and his friends was also converted into movies for the biggest joy of the Potterheads. After 7 books and 8 movies, J.K Rowling decided to stop the saga. The deception of all the fans was huge but fast because in 2015 she came back with a new screenplay for a new movie named *"The fantastic beasts"*, which was well-accepted by the fans and the medias.

For all her story she was inspired by her life and her imagination. Personally, I'm a big fan of the Wizarding World she built in all pieces and I find this woman incredible for her imagination.

And you, which woman inspires you?

Marianne MOGIS

Cinema x Space

2021 is the year where Tom Cruise will even more enter the legend. In fact, the American actor will do a space travel, with the help of the boss of SpaceX and Tesla, Elon Musk, and thanks to the NASA. The project was in there minds a year ago, they formalized the trip, and it's scheduled for October 2021.
The idea of the mission is to go to space, and to shoot a film directed by Doug Liman, the man who directed the sci-fi movie: ***Edge of Tomorrow***. Him and Tom Cruise, are going to be driven by the recordman of spacewalks, Michael Lòpez-Alegrìa. He's famous for holding the highest number of spacewalks (10), and today, he spent two hundred days, twenty two hours and forty six minutes in space, which is insane. Those three will left the Earth on board of a SpaceX space shuttle link to the company Axiom.

Tom Cruise in ***Edge of Tomorrow***

The goal of this mission is also, like the NASA said, to make the new generation of engineers and scientists wants to engage in spatial research. Moreover, the mission will take place from a base of spatial tourism, a big progress for humanity.
The main topic, the film, is still mysterious. It was introduced to Universal, during an unbelievable Zoom conference. In fact, the budget is for now estimate to 200 million of dollars.

Maël BOUTOUIL

“Inglorious Basterds”

The story takes place during the second world war and tells the revenge of a young Jewish girl: Shoshana Dreyfus whose family was killed by the Nazis. At the same time, there is a commando of American Jewish soldiers, led by Haldo Raine (Brad Pitt), wish arrives in France to kill as many Nazis as possible, before successfully attacking their leaders.
This movie is full of cults shots where we see a group of childish soldiers having fun killing nazis without any serious.
In this movie, there are very famous actors like Brad Pitt, Christophe Waltz, Michael Fassbender and Diane Kruger.
The movie is original because it is the Nazis who fears the Jews, while in other war movie, it is the opposite. The movie is inspired by history with realism. For example we are given the names of German leaders who really existed. But it is actually not a historical movie.

I chose to talk about “Inglorious Basterds” because i like the war movies and this one is original with a lot of fun and comedy. Moreover this film is a Quentin Tarantino’s movie. The film had several awards: 7 Oscars, 3 Golden Globes and 5 Bafta Awards.
I think the goal of the movie is to show the revenge of Jewish soldiers (people most affected by the war) against the horrors the Nazis inflicted on them.
Horrors that one can imagine absurd by the director.
The End.

INGLOURIOUS BASTERDS

Sarah BENTAYEB

The fires in Australia

After 5 months of intense fires in Australia, caused by global warming, the ecological and economic balance sheet is very critical.

The fires initially affected mainly the eastern part of the country and then north-eastern Victoria.

The fires took place in the forests. The smoke was so intense that it created pollution that reached more than 80% of the inhabitants of Australia.10.7 million hectares are destroyed.

The fires attacked the fauna and flora. Biodiversity too, because animal species could disappear. 3 of them gave their lives. More than a billion animals perished in the flames.

We can never thank enough the firefighters who were very competent to control such violent and dangerous fires. Unfortunately, around thirty people died. 4,4 billion of Australian dollars (2,7 milliard euros) are spent for this disaster.

A little bit of vocabulary...

Firefighters : Pompiers
Global warming : Réchauffement climatique
Balance sheet : Le bilan
Billion : Milliard
Unfortunately : Malheuresement

Chloé MAUNOURY and Perrine GUILLORY

NOBEL PRIZE 2020

This year a lot of women have won the prize in comparison to last year but the award still misses diversity because any black people have won the prize in 2020. For the nominations, the Nobel Prize of medicine was awarded on Monday to Drs. Harvey J. Alter, Michael Houghton and Charles M. Rice for their discovery of the hepatitis C virus, which led to the development of tests and treatments. Then Louise Glück received the Nobel Prize in Literature on Thursday for “her unmistakable poetic voice that with austere beauty makes individual existence universal”. She has written twelve collections of poetry and two books of essays and she is a very well-liked American poet. After the World Program of Food has won the Peace Nobel prize for its "efforts to combat hunger" and limit the starvation during the corona-virus pandemic.

Genome editing is a group of techniques used to modify the DNA, in a genome (all of chromosome and Genoa of an anatomy). And this year, the feminine duo who won the Nobel Prize in Chemistry, made a new easier and speeder system: CRISPR/Cas9, to cut the DNA in any cell. He targets a precise series DNAs associated with the enzyme Cas9 (is a protein originating from a bacteria with antiviral Properties, who have an ability to cut with precision the DNA). Then, when the series of DNAs are cut, both ends of the DNA will be repaired. Genome editing is used to correct a genetic mutation or treat a rare illness; CRISPR/Cas9 is promising for the genetic therapy and is created by women.

This 6th October, the Nobel Prize in Physic was won by Roger Penrose, Reinhard Genz and Andrea Ghez for groundbreaking rese into black holes. The British Roger Penrose discovered that “black hole formation is a robust prediction of the general theory of relativity”. With the Nobel laureate Albert Einstein’s general theory of relativity, he m mathematical methods to show that the b holes are a consequence of the scientific theory. Reinhard Genzel and Andrea Ghez discovered “a super massive compact obje at the center of our galaxy”, everything suggests that it could be a giant black hole

Some history about Nobel Prize. The Nobel Prize has been created by the will of Alfred Nobel, inventor of dynamite. The Nobel Prize of Economy was created by Sweden's central bank, in 1968. The five “original” Prizes were awarded for the first time in 1901. The Nobel Prizes of Chemistry, of Economic Sciences, of Physics, of Physiology and Medicine, of Literature are delivered by Sweden committees, but the Nobel Peace Prize is delivered by the Norwegian Nobel Committee. These nominations can be criticized given that the majority of nominees are white American men.

Manon FARCY, Sören NEUWIRTH and Thoma POULIQUEN

CHRISTMAS : Asia and Africa

What about Christmas day in Africa ?

Globally, in Africa, Christians (who are very numerous) celebrate Christmas dancing and singing during religious processions until churches. Just like western cultures, Christmas and its eve are very joyful days and presents are given too. But, beside European people, those gifts are only for children, representing the Three Kings visit to little baby Jesus.

Let's talk about one country in particular : Benin ?

At this time of the year, Benin still coexist with an approximative 90°F temperature. Streets are decorated with ornaments and swags with the effigy of Santa Claus. Just like European countries, toy stores compete to sell the more, using sales.
Benin completely dedicates this celebration to children, and as in the whole Africa, they are the only one presents are given to.
All around November, and December, groups of children of teenagers walk in the streets, browsing for houses and their owners to sing them traditional songs. They also all wear a kaleta, a colourful mask on their face. Children really enjoy playing instruments on those days, and even beat the pace using whatever they find.
Adults must thanks these children giving them a tip, or anything they could enjoy ! By the way, if at the end of the show adults do not thank them this way, then children start to sing a song about stinginess…
As time goes by, many people start to think Africa's Christmas tradition weakens : more and more families appreciate to decorate their houses with a Christmas tree, which is a typical behaviour of western people. Also, the social-economic issues of the country can be a real problem : when parents don't have enough money to buy toys to kids, sellers can't make any benefit. Hopefully, orphanages contribute a lot in helping most penalized ones.

Alice GOMONT

Christmas in China: a new tradition or a new commercial lever ?

Christmas is lowly celebrated in China where only 1% of the population is Christian. In recent years, Christmas has been developped under the influence of the globalization.

Decorations appeared in the big cities. Christmas became famous for several years and is associated with the Occident. Christmas is called 圣诞节 "Sheng Dan Jie" and Santa Claus is known as 圣诞老人 "Shen Dan Lao Ren".

Christmas, a commercial lever for the Chinese ?

It is the commercial aspect of Christmas that is most noticeable in China. Christmas allows sales. So the Chinese, as good storekeeper, take advantage of it. The red colour which symbolizes Christmas, is everywhere and it becomes the perfect commercial pretext because in China red is also the colour of wedding, luck, happiness! The Chinese Christmas is therefore a clever capitalist alibi that makes Chinese do shopping.

What about Chinese New Year in all this?

The real end-of-year celebration for the Chinese is the New Year, which in comparison, is a family celebration. The Chinese New Year takes place according to the lunar calendar between January and February. However, it is by no means the equivalent of Christmas. This period is then the occasion for Chinese families to be together and wish each other a beautiful new year full of prosperity.

Clara WANKIEWICZ