



ERASMUS+ KA229 – School Exchange partnership
"EDUCATION WITHOUT BORDERS"



EDUCATION THROUGH

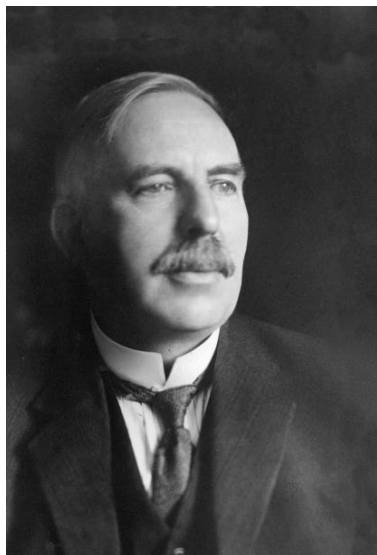


Introduction

Sciences have always existed, since the appearance of humans because it's a basis. Humans always needed sciences to develop our world such as we know it now:

Education or medicine for example. In our booklet, we will talk about several famous scientists who really improved the world of science from all around Europe. Let's start!

Famous English scientists



Ernest Rutherford

Ernest Rutherford was the son of James Rutherford, a farmer, and his wife Martha Thompson originally from Hornchurch Essex, England.

James had emigrated to New Zealand from Perth Scotland to raise a little flax and a lot of children.

Ernest was born 30 august 1871 at Brightwater near Nelson New Zealand.

His first name was mistakenly spelled 'Earnest' when his birth was registered.

Rutherford's mother Martha Thompson was a schoolteacher.

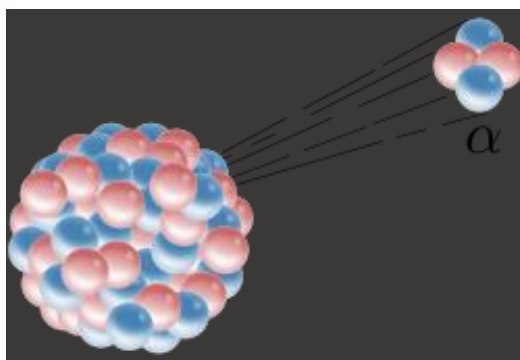
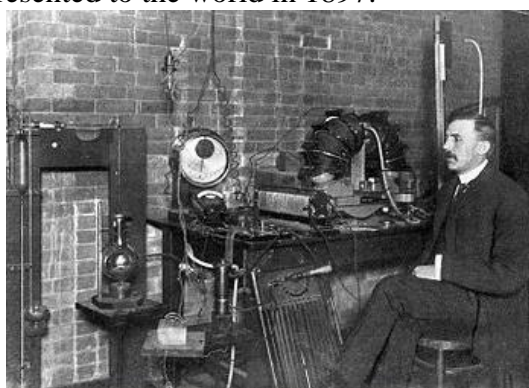
Ernest died at 19 October 1937, age 66 Cambridge England.

At Cambridge, Rutherford started to work with J. J. Thomson on the conductive effects of X-rays on gases, work which led to the discovery of the electron which Thomson presented to the world in 1897.

Hearing of Becquerel's experience with uranium Rutherford started to explore its radioactivity discovering two types that differed from X-rays in their penetrating power.

Continuing his research in Canada, he coined the terms alpha ray and beta ray in 1899 to describe the two distinct types of radiation.

He then discovered that thorium gave off a gas which produced an emanation which was itself radioactive and would coat other substances.



Alpha particles, also called alpha ray or alpha radiation, consist of two protons and two neutrons bound together into a particle identical to a helium-4 nucleus.

They are generally produced in the process of alpha decay but may also be produced in other ways. Alpha particles are named after the first letter in the Greek alphabet α .

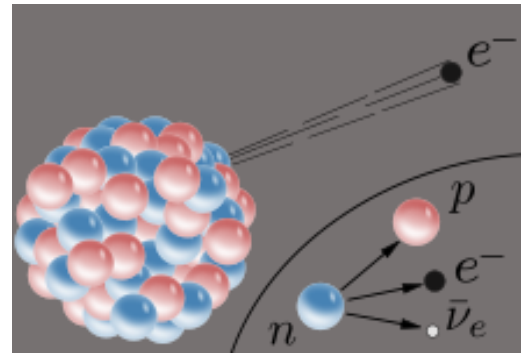
The symbol for the alpha particle is α or α^{2+} .

Because they are identical to helium nuclei, they are also sometimes written as He^{2+} or ${}^4_2\text{He}^{2+}$ indicating a helium ion

with a +2 charge (missing its two electrons).

A beta particle, also called beta ray or beta radiation (symbol β), is a high-energy, high-speed electron or positron emitted by the radioactive decay of an atomic nucleus during the process of beta decay.

There are two forms of beta decay, β^- decay and β^+ decay, which produce electrons and positrons respectively.



William Harvey

William Harvey was born in April 1st 1578 in Folkstone and died June 3 1657 in London at the age of 79.

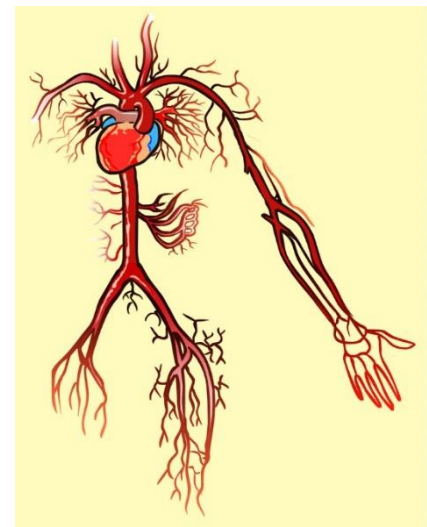
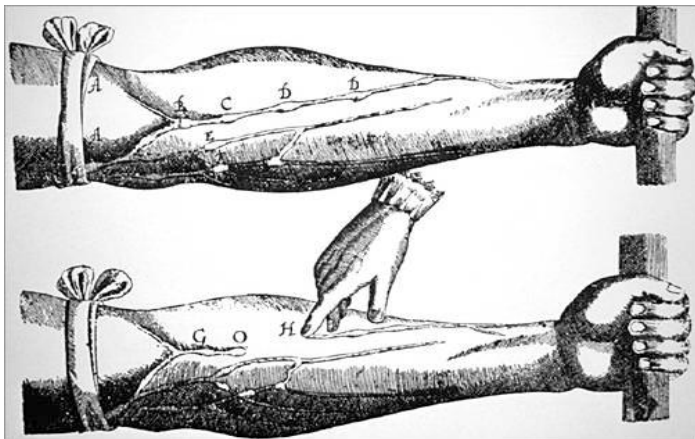
He studied art and medicine at Cambridge university he also studied in Italy. He earned his degree in 1603 then, in 1609 Harvey was appointed to the staff of St. Bartholomew's Hospital.

He was elected a fellow of the Royal College of Physicians in 1607. Harvey's ideas about circulation of the blood were first publicly expressed in lectures he gave in 1616.

Harvey became court physician to King James I in 1618 and then to Charles I, then sadly in 1657 he suffered a stroke and died.

William Harvey discovered the circulation our blood and how it travels around are body. This was discovered in 1628, by observing the development of the chick in the egg. He then dissected mammal embryos

in various stages.



Harvey was also the first to suggest that humans and other mammals reproduced via the fertilisation of an egg by sperm.

1628 he published his theories in a book entitled 'An Anatomical Study of the Motion of the Heart and of the Blood in Animals'.

Elizabeth Browne, daughter of Elizabeth I's physician, in 1604.

Harvey's theory about reproduction was confirmed by Von Baer in the 19th century.

Harvey made one major medical discovery but possibly his lasting legacy in terms of medical practice was his belief in experiments to prove or disprove what you believed in.

He was one of the examiners of four women from Lancashire accused of witchcraft in 1634, and as a consequence of his report, all of them were acquitted.



William was the eldest of nine children, seven sons and two daughters, of Thomas and his wife Joan Halke.

Harvey was buried in Hempstead, Essex.

He had no kids and his wife died seven years before he did.

Ada Lovelace

Ada Lovelace was a British scientist who worked as an English mathematician and writer, chiefly known for her work on Charles Babbage's proposed mechanical general-purpose computer, the Analytical Engine.

She was born on 10 Dec 1815 in London, England and died on 27 Nov 1852.

She was the first to recognize that the machine had applications beyond pure calculation, and published the first algorithm intended to be carried out by such a machine.

Ada Lovelace was a longtime friend of Cambridge mathematics professor CHARLES BABBAGE. Babbage invented the Difference Engine in 1822 (based on an idea by J. H. Muller written down in 1786).

The Difference Engine was a theoretical mechanical computer designed to automatically produce error free tables of numbers (something that was historically difficult to do). Although it would be built in 1985, the Difference Engine was never built by Babbage in his time.

By 1834 Babbage switched his focus to a new project, the Analytical Engine. The Analytical Engine is today considered "the first general purpose computer".

The Analytical Engine was designed to use punch cards for input and output (just like computers would 100 years later). The above said, Babbage was never able to build his Analytical Engine either. He was, however, able to give speeches on how it would work in theory. In 1842 Ada annotated a speech, by her now longtime friend Charles Babbage, about the Analytical Engine.

Ada Lovelace is sometimes regarded as the first to recognize the full potential of a "computing machine" and one of the first computer programmers. SHE invented a code for Charles Babbage's machine which Ada was ambitious and wanted to show how the machine could calculate more conceptual things like Bernoulli numbers (Babbage had thought of the machine as more of a super-powered calculator).

Diagram for the computation by the Engine of the Numbers of Bernoulli. See Note G. (page 722 et seq.)

Number of Operations	Name of Operation	Variables acted upon.	Variables receiving results.	Indication of change in the value on any Variable.	Statement of Results.	Data.										Working Variables.										Result Variables.			
						V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	V_{11}	V_{12}	V_{13}	V_{14}	V_{15}	V_{16}	V_{17}	V_{18}	V_{19}	V_{20}	V_{21}	V_{22}	V_{23}	V_{24}
1	X	$V_1 \times V_1$	V_2	V_2	$2n$	1	2	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	+	$V_2 + V_1$	V_3	V_3	$2n-1$	1	...	n	2n	2n	2n	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	+	$V_3 + V_1$	V_4	V_4	$2n+1$	1	...	2n+1	2n+1	2n+1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	+	$V_4 + V_1$	V_5	V_5	$2n-1$	1	...	2n-1	2n-1	2n-1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	+	$V_5 + V_1$	V_6	V_6	$2n+1$	1	...	2n+1	2n+1	2n+1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	+	$V_6 + V_1$	V_7	V_7	$2n-1$	1	...	2n-1	2n-1	2n-1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	+	$V_7 + V_1$	V_8	V_8	$2n+1$	1	...	n	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	+	$V_8 + V_1$	V_9	V_9	$2n-1$	...	2	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	+	$V_9 + V_1$	V_{10}	V_{10}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	X	$V_{10} \times V_1$	V_{11}	V_{11}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	+	$V_{11} + V_1$	V_{12}	V_{12}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	+	$V_{12} + V_1$	V_{13}	V_{13}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	+	$V_{13} + V_1$	V_{14}	V_{14}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	+	$V_{14} + V_1$	V_{15}	V_{15}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	X	$V_{15} \times V_1$	V_{16}	V_{16}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	+	$V_{16} + V_1$	V_{17}	V_{17}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	+	$V_{17} + V_1$	V_{18}	V_{18}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	+	$V_{18} + V_1$	V_{19}	V_{19}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	+	$V_{19} + V_1$	V_{20}	V_{20}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	X	$V_{20} \times V_1$	V_{21}	V_{21}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	+	$V_{21} + V_1$	V_{22}	V_{22}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	+	$V_{22} + V_1$	V_{23}	V_{23}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	+	$V_{23} + V_1$	V_{24}	V_{24}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	+	$V_{24} + V_1$	V_{25}	V_{25}	$2n-1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	+	$V_{25} + V_1$	V_{26}	V_{26}	$2n+1$	...	2n	...	...	...	2n	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Here follows a repetition of Operations thirteen to twenty-three.

Her discovery was described as "something no one would ever think would be possible."



Alexander Graham Bell

Alexander Graham Bell was born in March 3rd 1847 in Edinburgh and died August 2nd 1922 in Beinn Bhreagh.

His spouse was Mabel Gardiner Hubbard - 1877–1922.

Alexander Graham Bell was the man who invented the telephone. He was educated at Edinburgh High School, Edinburgh University and the University of London. Afterwards he taught elocution and music. Then in 1870 Bell moved to Canada with his family. (His health was poor and they hoped the move would help him recover).

Alexander Graham Bell was a Scottish-born scientist, inventor, engineer, and innovator who is credited with inventing and patenting the first practical telephone. He also founded the American

Telephone and Telegraph Company in 1885.

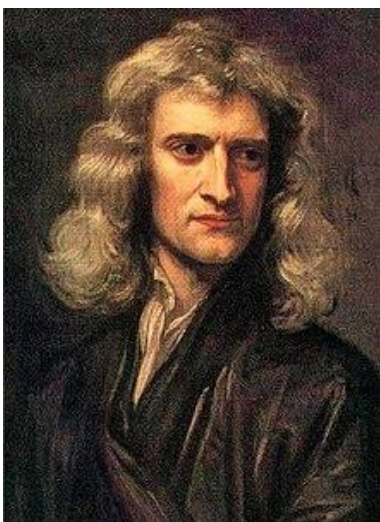
Later Alexander Graham Bell moved to the USA and in 1872 he opened a school for training teachers of the deaf in Boston. In 1873 he became Professor of Vocal Physiology in Boston University.

Bell experimented with ways of using electricity to transmit sound, helped by his assistant Thomas Watson and in 1876 he patented the telephone. He also invented a way to transmit sound using vibrations in a beam of light.

Alexander Graham Bell also carried out experiments in many other subjects and in 1898 he became President of the National Geographical Society. He was also interested in the problem of mechanical flight and experimented with kites.

Bell married a deaf woman in 1877 and they had four children. Bell became a US citizen in 1882 but in 1855 he purchased a summer home in Nova Scotia. Alexander Graham Bell died in Nova Scotia on 2 August 1922. He was 75.

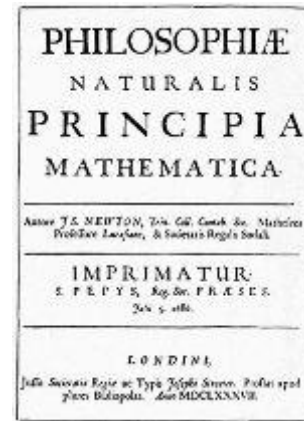
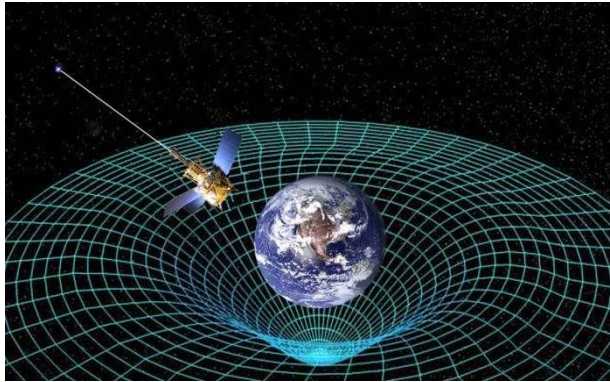
In 1876, Alexander Graham Bell was the first to be granted a United States patent for a device that produced clearly intelligible replication of the human voice. This instrument was further developed by many others. The telephone was the first device in history that enabled people to talk directly with each other across large distances. Telephones rapidly became indispensable to businesses, government and households and are today some of the most widely used small appliances.



Isaac Newton

Sir Isaac Newton FRS PRS was an English mathematician, physicist, astronomer, theologian, and author who is widely recognised as one of the most influential scientists of all time, and a key figure in the scientific revolution.

Isaac Newton made many scientific discoveries Gravity - Newton is probably most famous for discovering gravity. Outlined in the Principia, his theory about gravity helped to explain the movements of the planets and the Sun. This theory is known today as Newton's law of universal gravitation.



Isaac Newton is considered one of the most important scientists in history.

Even Albert Einstein said that Isaac Newton was the smartest person that ever lived. During his lifetime Newton developed the theory of gravity, the laws of motion (which became the basis for physics), a new type of mathematics called calculus, and made breakthroughs in the area of optics such as the reflecting telescope.

Famous French scientists



André-Marie Ampère is a French mathematician, physicist, chemist and philosopher. He was born in 1775 and died in 1836, he was a member of the science academy and a teacher in an upper school called École Polytechnique.

Self-taught, Ampère contributed to the development of mathematics by introducing it to physics.

He made important discoveries in the field of electromagnetism. He built the theoretical foundations and discovered the foundations of the electronics of matter. He is also the inventor of many devices such as solenoids, telegraphs and electromagnets.

Ampère was interested in many fields of science such as electricity, magnetism, chemical affinities, natural history, botany; he was also interested in poetry and metaphysics. His main discoveries concern electromagnetism and chemistry.

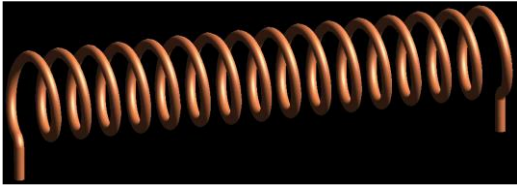
Ampère discussed mathematics, including probability theory and the study of the integration of partial differential equations. Ampère's most famous law is that of electrodynamics. It describes the forces that two parallel conductors travelled by electric currents exert on one another. If the direction of the current is the same in the two conductors, these attract each other; if the current moves in opposite directions, the drivers repel each other. It also describes the relationship between the force of the current and that of the corresponding magnetic field. These works found electrodynamics and considerably influenced the physics of the nineteenth century.

He is the creator of the vocabulary of electricity, he invented the terms “current” and “voltage”.



His name was given to the international unit of electric current intensity, the ampere. He is one of the 72 scientists who have his name on the Eiffel Tower.

When he died, André-Marie Ampère attracted many national and international tributes. His image appears on a brown postal stamp of 1936 worth 75 centimes (the ancient money in France).



Ampère's solenoid is a helical coil which produces a magnetic field when crossed by electric current



The Ammeter, from "Ampère + meter (old and new)"



Jean Casimir Félix Guyon was born on July 21th 1831 at Saint-Denis, on Reunion Island and died on July 20th, 1920.

He studied medicine at Nantes and in 1858, supported his theory on the fibrous tumours in the state of vacuity.

Then, he dealt with the theory on the tumours of the womb and became hospital surgeon at 31 years old.

In 1867, at the Necker Hospital in Paris, he studied the urinary pathology and brought chirurgical solutions for vesical and renal infections. He became the creator of modern urology. After 1870, he studied more on the urinary pathologies and proposed chirurgical solutions for renal and vesical strict infections. He worked on prostate, calculous and tumorous vesical pathologies.

He presided over the Academy of Sciences in 1892 and the Medicine Academy in 1901.

In Reunion Island, the name Felix-Guyon was given to the first hospital in 1908. Nowadays, the regional hospital centre of Reunion Island is named: Hospital Centre Felix-Guyon.



Joseph Hubert is a scientist, botanist and naturalist, and is a native of Saint-Benoît (a town in the northeast of the island).

He was born on April 23th 1747 at Saint - Benoît, on Reunion Island and died on April 19th, 1825.

First in 1769, he went to the Pamplémousse (Grapefruit) Garden in Mauritius, where he met new species, which he would bring to Reunion Island.

He met Pierre Poivre and Cère who were both sensitive to his passion for botany. They gave him the small plants of some new species.

In June 1784, he accompanied the Governor of Bourbon, as he was looking for new land to develop spice trees.

They left Saint-Benoît to reach the South coast, crossing Sainte-Rose, and reaching Langevin and Rivière des Remparts, they discovered the richness of this part of the island.

This is where the idea came to Joseph Hubert to cultivate cloves, before proposing to baptize this neighbourhood. This led to a slight dispute between the two men, namely the Governor and the botanist. Finally, the two decided to baptize this district of St. Joseph.

In 1785 he was appointed commander of the district of Saint-Joseph, a municipality he founded.

In 1788, he exhibited an all-new design on cyclones, speaking of a simultaneous rotational and translational movement that would be confirmed 15 years later by the German meteorologist Dove.

In 1789, Joseph Hubert introduced the avocado tree to La Réunion.

The name Joseph Hubert is inscribed in the splendour of science, the botanists distinguished him with the scientific name of Hubertia, given to a plant known as ambavilles.

To conclude, this fan of botanism is at the origin of many discoveries, like that of the functioning of a tropical cyclone, to which is added research in volcanology, Petrography, meteorology and importation of plants that is a part of our fauna and flora. He is particularly recognized in the Indian Ocean. A statue of his bust and head was erected in the State Garden in St Denis, and a street in St Louis as well as a high school in St Joseph are named Joseph Hubert in Réunion Island.



The clove tree and nutmeg tree were introduced to Reunion island by Joseph Hubert.



He also developed the culture of curcuma and coffee on the island.



Blaise Pascal

Born in Clermont-Ferrand in 1623, he died in Paris in 1662.

He was French mathematician, physicist, inventor, philosopher, moralist and theologian.

At the age of 11 he solved Euclid's 23 resolutions. At the age of 12 he started to work alone on geometry.

At the age of 16 he wrote a brilliant geometry essay that even Descartes (a famous philosopher) refused to believe he had written it alone.

In 1654, he developed a resolution which would allow later (in the 17th century) to give birth to the probability calculation and which will strongly influence economics theories and social sciences.

At the age of 19, he invented a calculator.

The Pascaline is a calculator named after its inventor, Blaise Pascal.





Louis Pasteur was a French chemist and microbiologist of the 19th century. He was one of the most important founders of medical microbiology.

Louis Pasteur came up with the food preparing process known as pasteurization and he also developed a vaccination for anthrax and rabies. Pasteur also illustrated how germs grew from contamination and disproved the theory of spontaneous contamination.

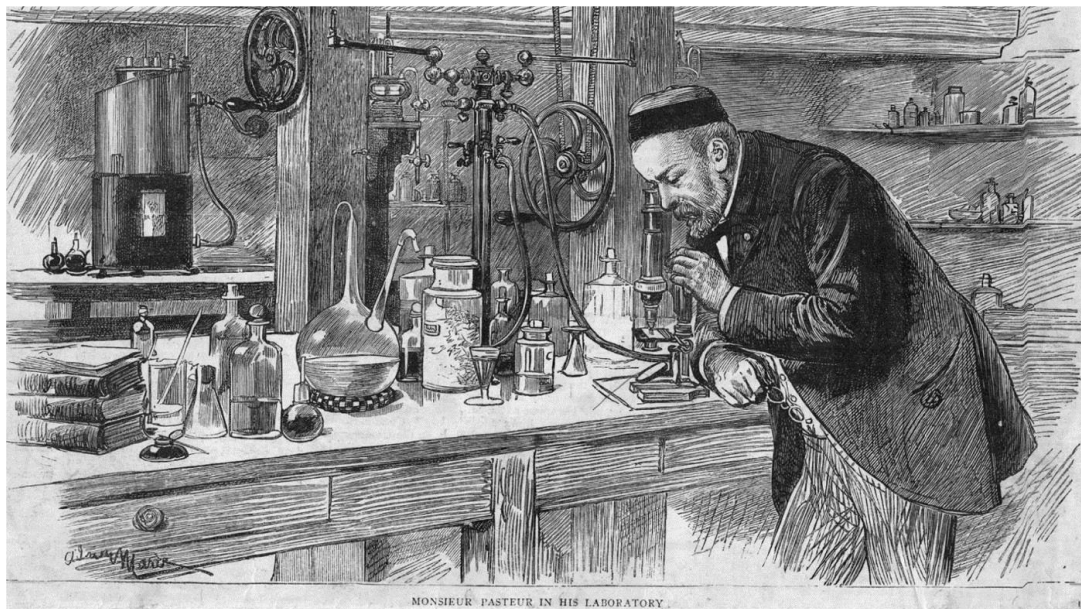
Louis Pasteur was born in Dole, Eastern France in 1822 and died in 1895.

The first great contribution of Pasteur happened in the decade of 1840, and it involves a discovery made from the structure of tartaric acid. After that achievement, at the age of 26, he was awarded the Legion of Honour.

The next of his contributions is related to microbiology. The Frenchman is the creator of the pasteurization, which was named after him. It consists in subjecting the liquids to certain levels of heat and cooling them immediately, with the purpose of sterilizing them and decreasing the number of pathogenic microorganisms in them.

In the 1880s, Louis Pasteur studied the bacteria that caused avian cholera, and he also developed tests on anthrax disease. The success of a cure for these illnesses encouraged Pasteur to develop a cure for rabies, which was a very common disease at the time. Using similar principles, he developed a weakened strain of the disease.

More than any other person, Louis Pasteur helped to increase average life expectancy in the late 19th and early 20th Century. Today, there are some 30 institutes and an impressive number of hospitals, schools, buildings, and streets that bear his name.



Louis Pasteur in his laboratory, doing researches that lead to the rabies vaccination

Famous Hungarian Scientists



János Irinyi

The native form of his personal name is Irinyi János.

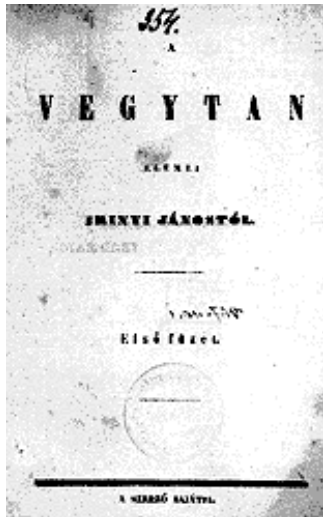
He was born on the 18th of May in 1817. His wife's name was Hermina Baranyi. He got married at the age of 51, and had two kids Janka and Lajos, both whom unfortunately died in their childhood.

He was a chemist and learnt at the Vienna University of Science. One of his university teachers, Paul Meisner had an unsuccessful experiment with the early type of match. He got the idea to make a safer match. He made the match safer by mixing the phosphorus with lead-dioxide in the head of the match instead of potassium chlorate. He later sold his invention to István Rómer,

the owner of a match factory, and used the money to go abroad and study at the University of Berlin.

He's invention is "the safety match", which are safe because it doesn't explode, and it doesn't light on every surface. It was invented in 1836 by János Irinyi. He replaced the potassium chlorate with lead dioxide. He later sold the rights to the "noiseless match" to István Rómer

János Irinyi's book, which he wrote at the age of 21, in 1838, in Berlin, in particular dealing with acids, contains also information about repairing saline soils.



He also founded the first Hungarian match factory. At the age of 65 he retired and moved to the city Vértes, where he lived until his death. After the Hungarian War of Independence fell, he had nothing published. He was the best chemist of the Reform Era.



*Hungary made a Memorial
Coin on the 200th anniversary of his birth.*





Ányos Jedlik

Birth Date: 11 January 1800

Invention: Dynamo, seltzer water, electro-motor

Job: physicist, engineer

Death: 13 December 1895

Ányos Jedlik invented the dynamo and kept it as a secret until 1856. Unfortunately, because of this the dynamo is dedicated to Siemens. He made the first electro-motor in 1828, which still works, and is kept in the

Museum of Applied Art in Budapest. He also invented the seltzer water, which is named after the container that it is stored in. The seltzer water is a Hungarikum.



Joseph Galamb

Birth Date: 3rd February 1881

Birth Place: Makó

Invention: Ford Model-T

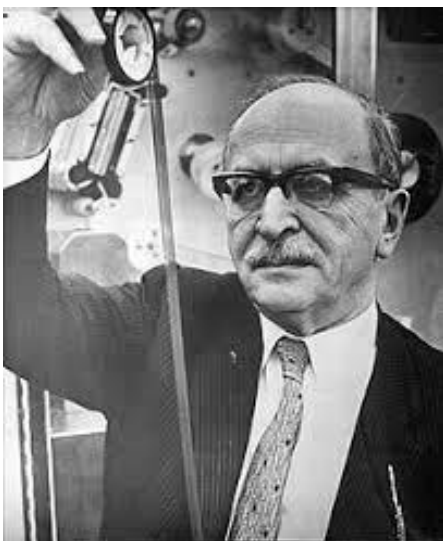
Job: Mechanical Engineer

Death: 4th December 1955

Joseph Galamb designed the Ford Model-T. From 1908 to 1927 15 million Ford Model-T cars were manufactured. The cars were assembled on a conveyor belt and this

meant, that they could make about 10000 cars every day.

The car was nicknamed „Tin Lizzy”. The car was successful, because its minimalistic design helped keeping the cost low.



Dénes Gábor

Birth Date: 5th June 1900

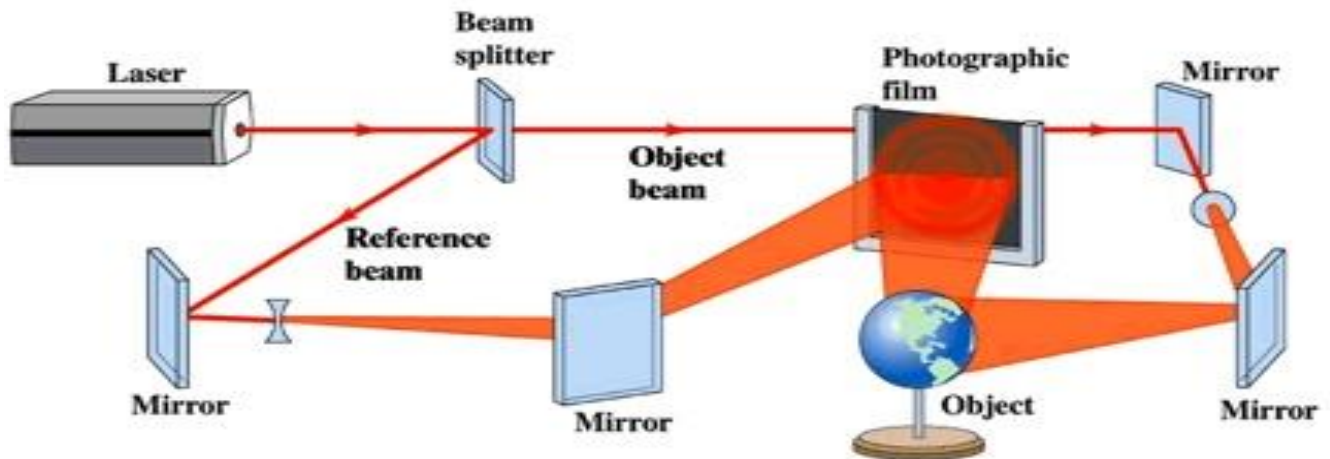
Original name: Dénes Günszberg

Awards:

- ***Physics Nobel-Prize***
- ***Rumford Medal of the Royal Society***
- ***IEEE Medal of Honor***
- ***Young Medal and Prize***

Invention: Holography

Dénes Gábor was a Hungarian Scientist, who became a British citizen in 1946. He was working at Thomas-Houston. A hologram is an image that appears in the 3rd dimension and can be seen without special glasses. Projecting a hologram requires a laser. It can be best seen in dim light conditions. Holography stands out from other 3D imaging techniques, because it doesn't require the use of glasses.



Describing holography



Albert Szent-Györgyi

Born: 16th September 1893

Invention/Discovery: Vitamin-C

Awards:

-Nobel Prize in Physiology or Medicine (1937)

-Albert Lasker Award for Basic Medical Research

Death: 22nd Oct. 1986

Albert Szent-Györgyi discovered Vitamin C. Vitamin C, also known as ascorbic acid, is a vitamin that can be found in all kinds of foods or sold as a dietary supplement. It is used to prevent and treat scurvy. In ancient history sailors died often because they didn't know that they should eat more Vitamin C during their time on the water. involved in the repair of skin tissue a Vitamin C, is an essential nutrient and the enzymatic production of certain neurotransmitters. We can find a lot of Vitamin C in the following fruits: lemons, oranges, apples, paprikas.



Famous Romanian Scientists



Traian Vuia (August 17, 1872 – September 3, 1950)

Traian Vuia was born to Romanian parents Simion Popescu and Ana Vuia living in Surducul-Mic, a village in the Banat region, Austro-Hungarian Empire, today in Romania; the place is now called Traian Vuia.

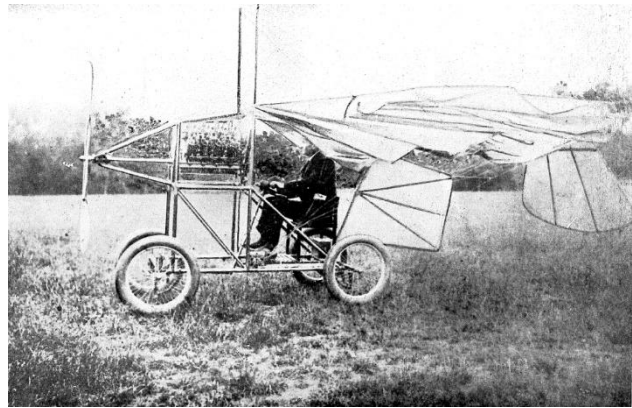
After graduating from high school in Lugoj, in 1892, he enrolled in the School of Mechanics at the Polytechnic University of Budapest where he received his engineering diploma.

He then joined the Faculty of Law in Budapest, Hungary, where he earned a PhD in law in May 1901.

He returned to Lugoj, where he studied the problem of human flight and designed his first flying machine, which he called the "airplane-car".



Traian Vuia in his Vuia I flying machine in 1906

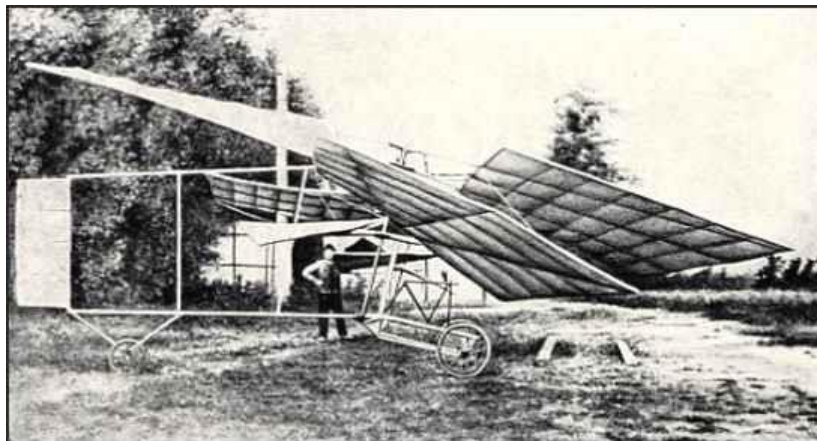


Vuia II flying machine in 1907

Between 1918 and 1921 Vuia built two experimental helicopters.

Another invention by Vuia was a steam generator with internal combustion that generates very high pressure – more than 100 atm (10 MPa) – that is still used today in thermal power stations.

Traian Vuia and one of his partners, Emmanuel Yvonneau, patented several types of gas generators.





Ana Aslan (1 January 1897 – 20 May 1988)

Ana Aslan was born in Brăila; she was the youngest of four children, two brothers and two sisters, born to Mărgărit and Sofia Aslan.

After the death of her father, the family moved to Bucharest, where she graduated the Central School in 1915.

Although the medical field was not a desirable field for women to enter, Ana Aslan decided that was the path she wanted to pursue and attended the Faculty of Medicine from 1915 to 1922.

During her time in undergraduate studies, she attended to soldiers as a nurse during the First World War.

After graduating from the Faculty of Medicine in 1922, she began working with Daniel Danielopolu who supervised her doctoral thesis. She obtained her M.D. degree in cardiovascular physiology in 1924.

Her focus was on physiology and the process of aging.

While investigating the pain-relieving effects of procaine in patients with arthritis, Ana Aslan discovered that the drug also produced other beneficial effects, such as an improvement of skin and hair aspect, better memory, and a general feeling of well-being. Based on this discovery, she developed the anti-aging drug **Gerovital H3** (1952). Later, together with Elena Polovrăgeanu, she created an improved formula marketed as **Aslavit** (1961).



The beneficial effects of **Gerovital** have been scientifically recognized. However, some studies have failed to replicate the anti-aging effects.

Ana Aslan is considered to be a pioneer of gerontology and geriatrics in Romania.

In 1952, she founded the Geriatric Institute of Bucharest. This institute was the first of its kind in the world and was recognized by the **World Health Organization**.

The Romanian Society of Gerontology was the first in the world to channel its research into clinic, experimental, and social researches, devise a therapeutic strategy to prevent the process of aging, and organize and national health network for the prevention of aging.

Her drug was used by many famous politicians and celebrities around the world, including John F. Kennedy.

“To be forever young does not mean to have 20. It means to be optimistic, to feel good, to have an ideal to fight for it and to get it!”



Petrache Poenaru (1799-1875)

Petrache Poenaru was born on January 10, 1799, in the locality Bănești, Vâlcea County, in an aristocratic family. The Romanian inventor attended the secondary school of Obedeanu Church in Craiova. After graduating he worked at the chancellor's office of the Râmnicu Vâlcea Diocese and then taught Greek at the Metropolitan School in Bucharest.

Petrache Poenaru was mathematician, inventor, pedagogue and engineer. The Romanian obtained the invention patent for a little

machinery receiving the name “portable pen which does not end, which feeds itself alone with ink” – this is how Petrache Poenaru described the first fountain pen in the world - in France, in the year 1827.

“The portable pen which does not end” played an important role in the development of the society, because the invention of the Romanian – the pen with ink tank – replaced the feathers and pens with metal nib. In this way there was not possible anymore to scratch the paper and the ink leakages have been eliminated. 50 years later, in 1884, Lewis Edson Waterman improved the fountain pen.



Petrache Poenaru was attracted by the life of outlaw ever since he was a child. This is why he joined them at the age of only 22. The inventor did not know how to use the gun or the knife, but he impressed the revolutionary Tudor Vladimirescu by his intelligence, so he took him as his secretary.

During the time he spent near Tudor Vladimirescu, Petrache Poenaru printed the first Romanian newspaper, “Foaie de Propagandă” (Propaganda newspaper), and, according to some witnesses of those days, the Romanian inventor also created the Romanian tricolour: red, yellow and blue.

Petrache Poenaru was obliged to leave the country after the revolution in 1821 was suppressed. Short time later, the inventor born in Vâlcea obtains scholarships in Vienna and Paris. During the time he studied typography and geodesy in Paris, at the Polytechnic School, Poenaru also invented the worldwide first modern fountain pen, the one with ink tank.

Petrache Poenaru is also the first Romanian to make a trip by train, in 1830, when he participated at the inauguration of the first railway, in England. In 1831, the pen’s inventor returned to Romania and started to dedicate himself to the Romanian education.

The name of Petrache Poenaru is also connected to the introduction of the metrical system in Romania. The Romanian inventor became a member of the Romanian Academy in 1870, and five years later he passed away.



Victor Babeș (4-July-1854 - 19-October-1926)

Victor Babeș was a Romanian physician, biologist, and one of the earliest bacteriologists. He made early and significant contributions to the study of rabies, leprosy, diphtheria, tuberculosis, and other infectious diseases.

The Romanian universities Babes-Bolyai in Cluj-Napoca and the University of Medicine and Pharmacy in Timisoara bear his name.

Born in Vienna (at the time, the capital of the Austrian Empire) as the son of Vincentiu Babeș, a Romanian from the Banat region, he studied in Budapest, then in Vienna, where he received his doctorate in science.

Attracted by the discoveries of Louis Pasteur, he left for Paris, and worked first in Pasteur's laboratory, and then with Victor André Cornil.

In 1885, he discovered a parasitic spore of the ticks, named Babesia, and which causes a rare and severe disease called babesiosis. In the same year, he published the first treatise of bacteriology in the world, Bacteria and their role in the histopathology of infectious diseases, which he co-authored with Cornil.

Babes's scientific endeavours were wide-ranging. He was the first to demonstrate the presence of tuberculous bacilli in the urine of infected patients. He also discovered cellular inclusions in rabies-infected nerve cells. Of diagnostic value, they were to be named after him (Babes-Negri bodies).

Babes was one of the founders of serum therapy, and was the first to introduce rabies vaccination to Romania. His work also had a strong influence upon veterinary medicine, especially concerning prophylaxis and serum medication. He became a professor of pathology and bacteriology at the Carol Davila University of Medicine and Pharmacy in Bucharest.

He was also a member of the Romanian Academy (in 1893), of the Paris Académie Nationale de Médecine, and an officer of the French Legion d'honneur. His nephew, Aurel Babes, was also a physician, and discovered a screening test for cervical cancer.



Henri Coanda

Henri Coanda was a Romanian inventor, a pioneer in aerodynamics and the builder of world's first jet plane. He discovered and gave his name to the Coanda effect.

Henri Coanda was born in 1886, in Bucharest, Romania. He studied at the Saint Sava National College and in 1899, his father transferred him to the Military High School in Iasi.

In 1903, he continued his studies at the School of Artillery, Military, and Naval Engineering in Bucharest. Coanda graduated with the rank of artillery officer, but he was more interested in the technical problems of flight.

In 1905, he built a missile airplane for the Romanian Army.

In 1907, he continued his studies at the Montefiore Institute in Liège, Belgium. In 1909, he travelled to Paris, where he enrolled at the Institut Supérieur de l'Aéronautique et de l'Espace, also known as SUPAERO.



In 1910, he designed, built and piloted **the first jet plane**, known as the **Coanda-1910**, which he exhibited at the second International Aeronautic Salon in Paris. At the airport of Issy-les-Moulineaux near Paris, Coanda lost control of the jet plane, which went off the runway and caught fire. He escaped with some minor injuries to his face and hands.

Between 1911 and 1914, he worked as technical director of Bristol Aeroplane Company in the United Kingdom, where he designed several airplanes known as **Bristol-Coanda Monoplanes**. In 1912, one of these planes won the first prize at the International Military Aviation Contest in the UK.

In 1915, he worked for Delaunay-Belleville in France, where he designed and built three different models of propeller airplane, including the Coanda-1916, with two propellers mounted close to the tail.

Other significant inventions were a construction material known as **beton-bois**, a device for detecting the liquids in the soil, a mobile platform for aerodynamic experiments, photographic aerodynamic specters.



In 1930, he discovered **the Coanda effect** that is the tendency of a stream of fluid to stay attached to a convex surface, rather than follow a straight line in its original direction.

On October 8, 1934, he got the patent for the invention called “Procedure and device for the deviation of a fluid inside another fluid”.

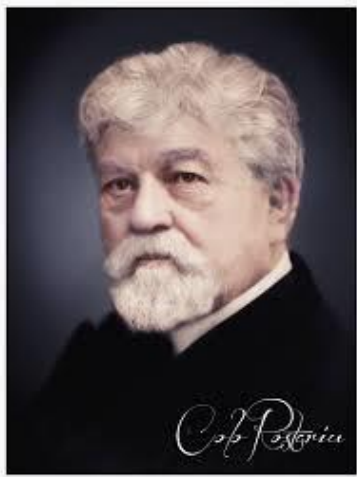
In 1935, he designed the **Aerodina Lenticulara**, which was very similar in shape with what is known today as “flying saucer”.

For his successful inventions, Henri Coanda was awarded many distinctions such as Harry Diamond Laboratories Award, Award and Grand Gold Medal “Vielle Tiges”, UNESCO Award for Scientific Research, The Medal of French Aeronautics, Order of Merit, and Commander Ring.

Coanda died in Bucharest, November 25, 1973 at the age of 86 leaving behind **2608 inventions**.

In 1995, the „Henri Coandă” Air Force Academy was established in Brasov.

In 2004, Bucharest Otopeni International Airport was renamed Henri Coanda International Airport.



Ioan I. Cantacuzino (25 November 1863 – 14 January 1934)

Ioan I. Cantacuzino was a renowned Romanian physician and bacteriologist, a professor at the Romanian School of Medicine and Pharmacy and a member of the Romanian Academy.

He established the fields of microbiology and experimental medicine in Romania, and founded the Ioan Cantacuzino Institute.

Born in Bucharest as a member of the Cantacuzino family, he graduated from the University of Paris' Faculty of Sciences and Faculty of Medicine, and worked at several hospitals in Paris, obtaining his doctorate in 1894. Later in the same year, he began his academic career as a deputy professor at the University of Iași, and returned to Paris after two years to serve on the staff of the Pasteur Institute, where he worked under the direction of Ilya Ilyich Mechnikov.

In 1901, Cantacuzino was assigned a teaching position in Bucharest, where he became a major influence on a generation of scientists. His discoveries were relevant in the treatment of cholera, epidemic typhus, tuberculosis, and scarlet fever.

As a disciple of Mechnikov, he devoted part of his research to expanding on the latter's field of interest (phagocytes, the body's means of defence against pathogens, as well as the issue of immunity and invertebrates). He invented the notion of contact immunity.

Ion Cantacuzino has carried out a rich research activity on cholera vibration and alcohol vaccination, active immunization against dysentery and typhoid fever, etymology and pathology of scarlet fever.

Starting with 1896, he published works on phagocytic systems and functions in the animal kingdom and on the role of electrophysiological phenomena in immune mechanisms.

Based on his researches on the cholera vibration, Cantacuzino has developed a method of vaccination against alcohol, called the "Cantacuzino method", a method used today in countries where there are still cases of cholera. Thanks to Ion Cantacuzino, Romania was the second country in the world, after France, which introduced the BCG vaccine ("Calmette-Guérin Bacillus") in 1926, with attenuated virulence germs, for the prophylactic vaccination of new-borns against tuberculosis.

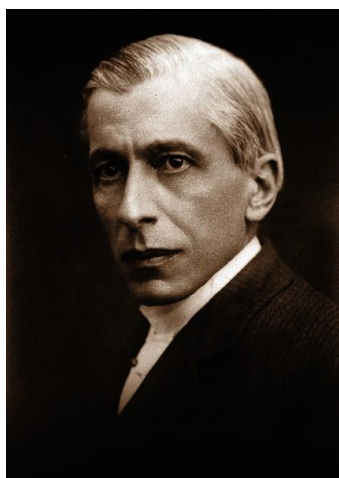
Ion Cantacuzino was a remarkable organizer of the anti-epidemic campaigns, a quality he demonstrated in combating the epidemic of exanthematic typhus and cholera during the First World War and in the anti-malarial campaign.



Ion Cantacuzino has been a full member of the Romanian Academy since 1925, a member of the Hygiene Committee of the League of Nations, of the societies of Biology, of Exotic Pathology and of the Paris Academy of Sciences. Numerous universities have awarded him the title of Doctor honoris causa, Lyon (1922), Brussels (1924), Montpellier (1930), Athens (1932) and Bordeaux (1934).

During the Second Balkan War, Cantacuzino was appointed head of the staff combatting the cholera epidemic in the ranks of the Romanian Army stationed in Dobruja; he was assigned to the same position during the Romanian campaign in World War I, in the fight against typhus. He founded and led the scientific magazines Journal of Medical Sciences and Archives Roumaines de Pathologie Expérimentale, and regularly contributed to the literary magazine The Romanian Life (replacing Paul Bujor on the editorial board).

A collaborator of Constantin Stere, he was noted as a Poporanist disciple of Constantin Dobrogeanu-Gherea.



Nicolae Păulescu

Nicolae Păulescu was born on the 8th of November 1869 in Bucharest, Romania. He was the first of the four children born to the Păulescu family. The young Păulescu showed remarkable abilities from a very early age by rapidly becoming fluent in French, Latin and Ancient Greek. He also had a talent for drawing, music and an inclination towards natural sciences. He finished high school in 1888 and then went to Paris to enrol in Medical School. He obtained his Doctor of Medicine degree in 1897 and then he worked at the Notre-Dame du Perpétuel-Secours Hospital until 1900, when he returned to Romania.

The two Canadians are believed to have made the discovery, because Păulescu had only managed to create a substance administrable to dogs when the First World War started in Romania and the scientist was forced to postpone the final stages of his research.

Banting and Best used Păulescu's work and developed the substance that was called insulin and could be administered to humans.

In 1916, he managed to obtain a substance which he extracted from a bovine pancreas and which he called pancreine. He wrote a paper in which he described his findings, called "Research on the Role of the Pancreas in Food Assimilation", which he submitted to the Archives Internationales de Physiologie in Liège, Belgium. It was published in August 1921.

Prof. Paulescu used this article and his patent to try to prove that was the true discoverer of insulin and the one who truly deserved the Nobel Prize, but it was to no avail.

He died in 1931 very unhappy about not receiving the recognition he deserved.

In 1968, the Scottish physiologist Ian Murray initiated an international campaign to restore the truth and as a result, the Nobel Committee recognized Păulescu's merits and his priority in the discovery of insulin, but refused to award any official compensation.





Emil Racoviță

Emil Racoviță is one of the most notable Romanian scientists, recognized all around the world for his contributions to science. He founded bio-speleology as a science and the first speleology institute in the world

Emil Racoviță was born in the village of Șorănești, in Vaslui County, to a wealthy old Moldavian family whose roots have been traced back to the 16th century.

He received his education in Iasi, where he was taught by one of the most famous Romanian writers, Ion Creangă.

In 1886, heeding his father's advice, Racoviță went to Paris to study law. But right after getting his degree, he enrolled at the Faculty of Science in Sorbonne, to follow his true calling. After graduating in 1891, he remained in France for another 5 years to write a doctoral thesis at the oceanology laboratory Arago in Banyuls-sur-Mer. He received his doctor's title with a research on a species of marine worms.

After defending his thesis, he received a letter from Liège asking him to go on a Belgian expedition that was to explore the shores of the Antarctic. He could not refuse this opportunity and as a result, he became the naturalist among the 19 scientists aboard the Belgica. This was the first expedition that was not motivated by the discovery of new land but by research and scientific observation. And it was very successful in its goals. The crew returned with 1.200 zoological exemplars and 400 biological exemplars, the collection of which was due mostly to Emil Racovita. He also made detailed observations about whales, seals and Antarctic birds.



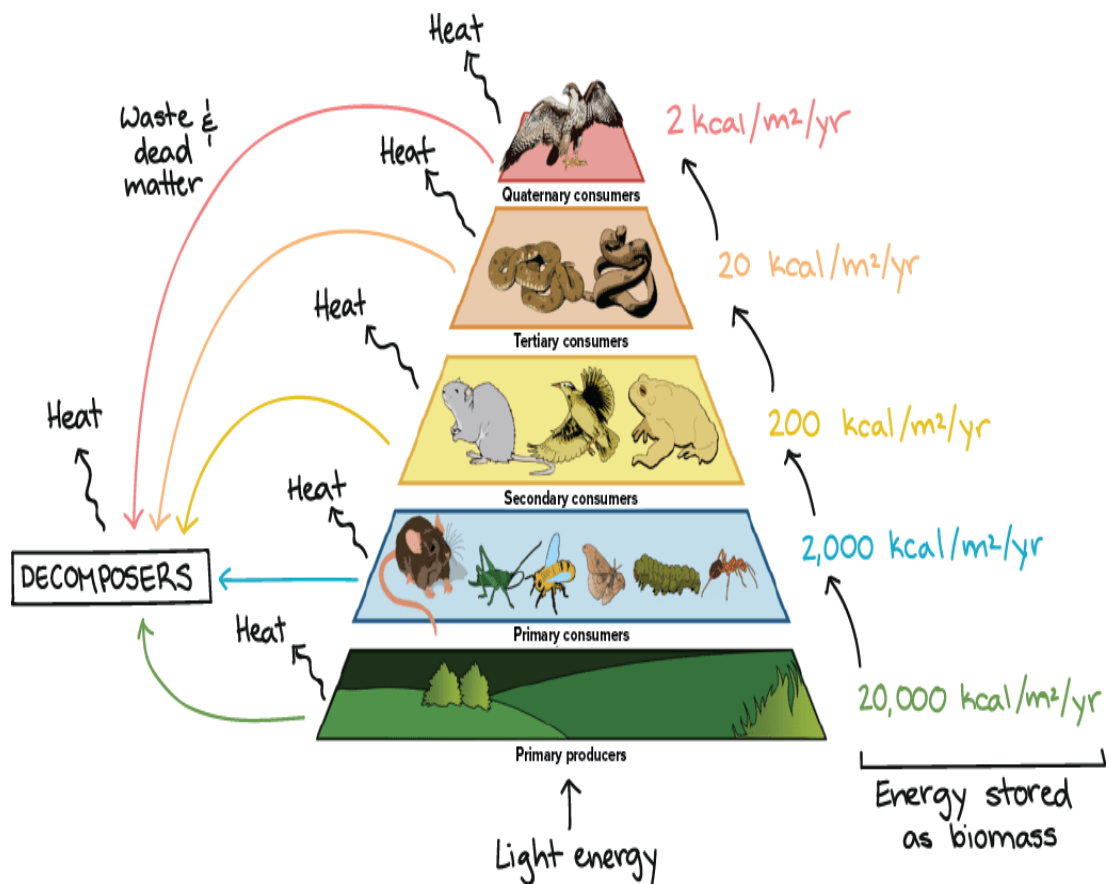
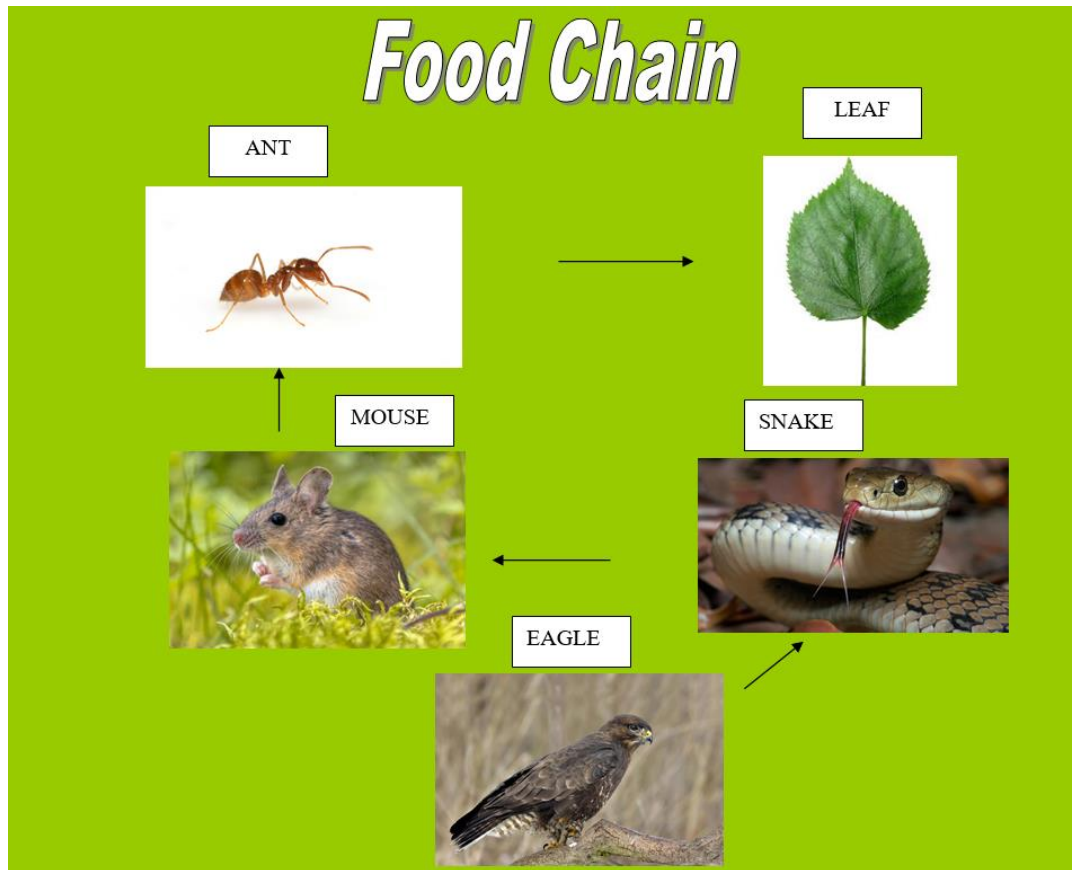
Next, in 1904, he went on an expedition to the Mediterranean and made a visit to the cave Cueva del Drach in Mallorca. This is where he found a crustacean unknown to science at the time, which he named *Typhlocirolana moraguesi*. He realized that studying these underground creatures and the way they adapted to their medium could give him an insight into biological evolution. The essay he wrote following his discovery would set the foundation for bio-speleology.

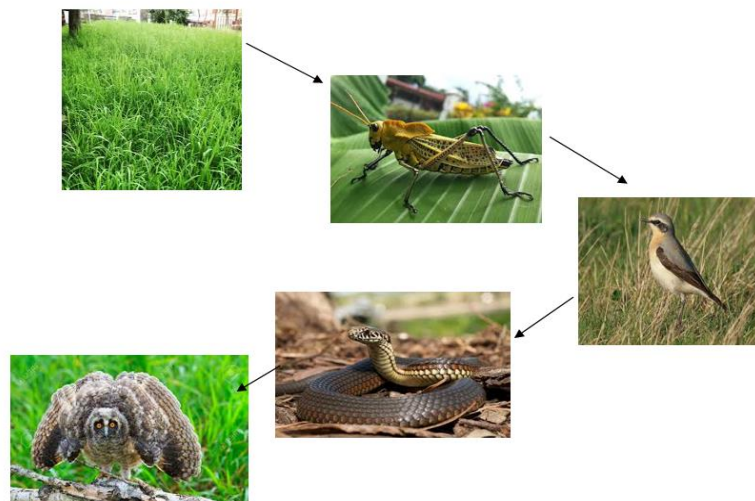
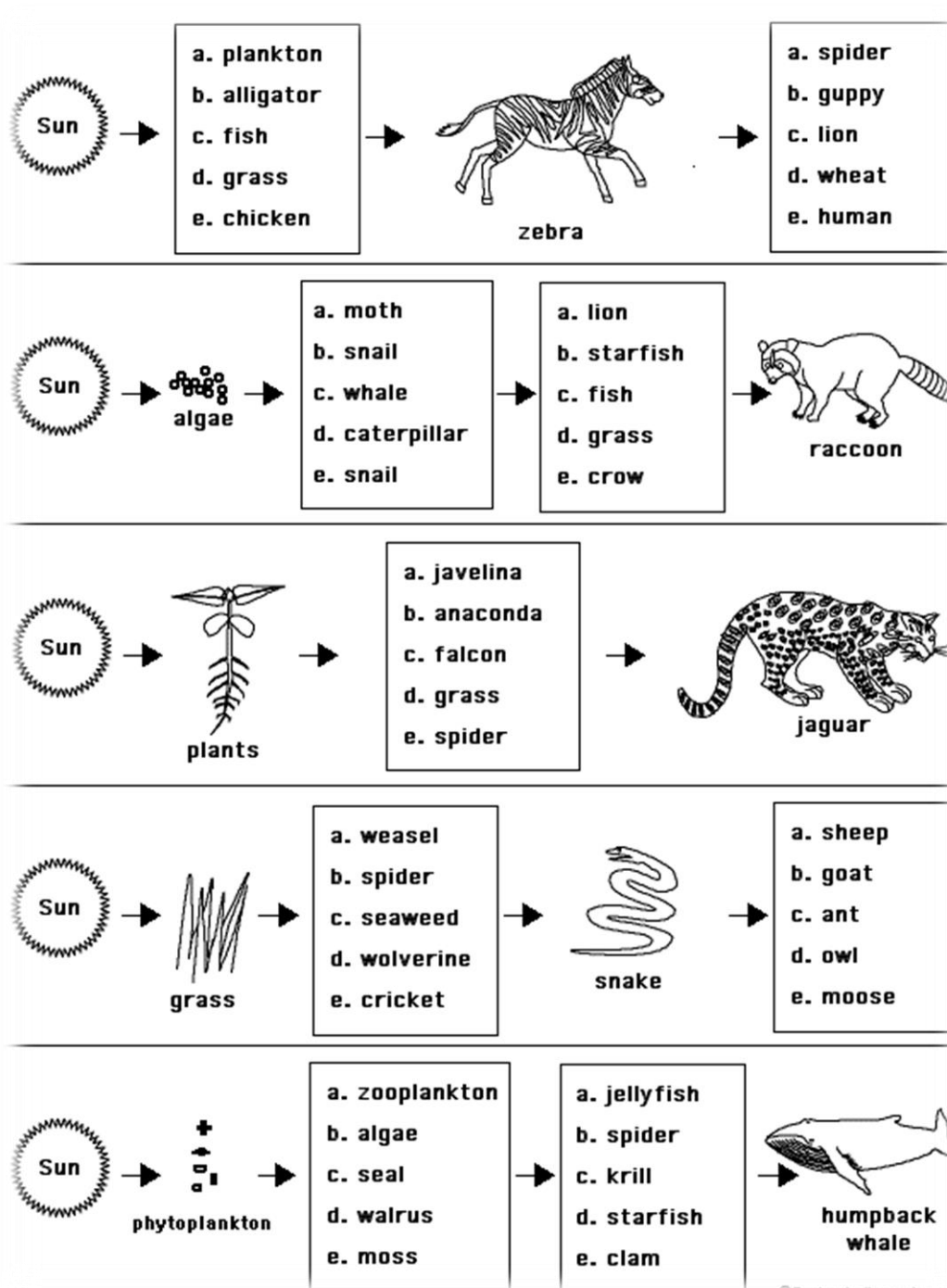
In the summer of 1919, Emil Racoviță was asked to be part of the first Romanian university in Transylvania. He agreed to do it on one condition, namely, that he be allowed to create a research institute dedicated to the study of speleology. And on the 26th of April, 1920, the Institute of Speleology in Cluj-Napoca was created, the first speleology institute in the world.

Emil Racovita died on November 17, 1947 at the age of 79.

His main works are "Essai sur les problèmes biospeologiques" ((Essay on biospeological problems) (1907), "Speleology" (1927) and "Evolution and its problems" (1929).

Food chains





Science discoveries Quiz

Quiz I

- 1) Who has discovered the Vitamin C?
 - a. Ampere
 - b. Albert Szent-G
 - c. Ada Lovelace
- 2) Which year was Ada Lovelace born in?
 - a. 1815
 - b. 2009
 - c. 1635
- 3) What is Ampere's discovery?
 - a. Vitamin C
 - b. The first Helicopter
 - c. Amperage Unity
- 4) Who is Ana Aslan?
 - a. Romanian Musician / Singer
 - b. Romanian Biologist
 - c. Romanian Poem-writer
- 5) What is the common point between all these scientists?
 - a. They're all European
 - b. They're relatives
 - c. They're all biologists

Answers:
1. b
2. a
3. c
4. b
5. a

Quiz II

- 1) When was the Hologram discovered?
 - a. 1947
 - b. 1950
 - c. 1945
- 2) When did Clément Ader construct the first flying machine?
 - a. 1890
 - b. 1886
 - c. 1874
- 3) When was William Harvey born?
 - a. 5 March 1578
 - b. 16 November 1578
 - c. 1 April 1578
- 4) Who discovered biospeological?
 - a. Grigore Antipa
 - b. Emil Racoviță
 - c. Clément Ader
- 5) At what age did Nicolae Paulescu die?
 - a. 61
 - b. 59
 - c. 73

Answers:
1. a
2. a
3. c
4. b
5. a

Quiz III

1) How do you write?

- a. Sence
- b. Siceince
- c. Science

2) What it is an Ampere unit?

- a. The intensity of the electric current
- b. The tension of the electric current
- c. The quantity of the electric current

3) What was the invention of Dennis Gabor ?

- a. Matchstick
- b. Holography
- c. Plane

4) When did Traian Vuia create the first plane?

- a. in 1900
- b. in 1906
- c. in 1950

5) What did Stephen Hawking help discover?

- a. Special relativity
- b. The Big Bang theory
- c. Quantum theory of light

Answers:
1. c
2. a
3. b
4. b
5. b

Quiz III

- 1) Who discovered pasteurization?
- 2) Who invented the first jet plane?
- 3) How did Newton's discovery change the world?
- 4) What did Albert Szent Gyorgyi discover?
- 5) How many Nobel Prizes did Albert Szent Gyorgyi won?

Answers:
1. Louis Pasteur.
2. Henri Coanda.
3. He made us believe in the law of motion and gravity.
4. Vitamin C.
5. Albert has won 3 Nobel Prizes.

This brochure is work's result of the five mixed teams during the Learning, teaching, training activity from the Scoala Gimnaziala Nr. 1 Moreni, Romania - May 2019.

GROUP 1

KIERAN
APRIL
MARKO
ANA
THOMAS
CECILE
BOGDAN

GROUP 2

OAKLEY
JOSH
MARIA
IULIAN
GITTA
MATHIAS

GROUP 5

ASHLEY
TEODORA
GABOR
RĂZVAN
QUENTIN

GROUP 3

LEWIS
TILLY
ROXIN
CĂTĂLIN
VIVI
ANTHONY
AMELIE

GROUP 4

JOSHUA B
ALEXIA
BERNI
RACHELLE
CLEMENTINE
VLAD



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