

**„XX - XXI CENTURY JOBS –  
BRIDGE THE GAP”**

# **OUTSTANDING POLISH DISCOVERERS AND INVENTORS**

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# CONTENTS

Jan Szczepanik.....	2
Jan Szczepanik's influence on industrial improvement.....	11
Jan Józef Ignacy Łukasiewicz .....	14
Maria Curie- Skłodowska .....	17
Paweł Edmund Strzelecki .....	20
Benedykt Dybowski.....	25
Stanisław Działowski.....	29
Stanisław Wigura.....	32
Franciszek Żwirko .....	34
Ignacy Domeyko .....	36
Kazimierz Funk .....	38
Rudolf Weigl .....	40
Zbigniew Religa.....	42

# Jan Szczepanik

Jan Szczepanik was born on 13<sup>th</sup> June 1872 in Rudniki near Przemyśl. As a one year-old child he was orphaned and his grandparents and his aunt Salomea took care of his upbringing. The folk school in Krosno was his first school. In the following years he also learned in the middle high school in Jasło, where his great talent for mathematics and physics was shown. However, he did not graduate from this school due to his problems with the Greek language. Despite some minor failures, he managed to graduate from the college for teachers in Cracow in 1891. Initially, he taught in Rudniki – the place where he was born.



As he said, he was considered to be an eccentric, as during a lesson he would sketch his new projects on the blackboard. His students took to him so much that they assisted him quite frequently.

In 1896 he decided to give up his career as a teacher to devote all his time to his passion – making new inventions. He moved to Cracow, where he met Ludvik Kleinberg – a photographic industrialist, who decided to finance his activities. According to the inventor, it was the first step in his career.

His childhood had a great influence on shaping his future life as an inventor. As a child, he used to steal bullets from his uncle and tried to take the gunpowder out of them. He took apart all of his toys just to see how they worked. He called his fascination with technology a God's blessing and the influence of the surrounding world. He was brought up in a poor family so he knew what hard and exhausting work was like. He was sensitized to poverty and his inventions were

mainly meant to ease the lives of ordinary people. Szczepanik was a very hard-working person devoted to his profession. According to the recollections of his only daughter – Maria, the inventor was entirely devoted to science. He spent all his life outside Poland and visited his home only for holidays.

He paid no attention to being famous. In one of her last interviews Maria said that her father, despite having a full wardrobe of clothes, used to walk around in just one outfit. He would walk around the room with a cigarette in his mouth and think about new projects. Szczepanik was not discouraged by his failures, especially the financial ones. He claimed that “You win some, you lose some”. He was not capable of doing business. Many of his enterprises were unsuccessful. He openly said that before you start research, you need to have financial backup and it is a necessity. In 1898 Szczepanik was in Vienna where he was conducting intensive research in Ungargasse and Pragestrasse laboratories and his accomplishment had already been noticed. The Emperor Frank Joseph I exempted Szczepanik from military service owing to the request from a Galician joint-stock company but in 1900 he was called up to do military service, and thus he ended up in Przemyśl where he met his future wife.



**Testing the ballistic vest**

In 1902 Jan Szczepanik married seven-years-younger Wanda, with whom he had five children (Andrzej, Zbigniew, Bogdan, Bogusław and Maria).



They shortly lived in Tarnow and then moved to Vienna for four years. In 1921-22 he created a partnership with his friend Zygmunt Górski – an oil industrialist.

They got the rights to explore the deposit in the Podkarpacie district. They bought the grounds but they did not manage to mine there. Szczepanik soon sold the mountainous regions he had formerly bought. After the First World War the inventor was outside home, generally in Berlin. During his stay in Berlin, his health condition deteriorated, therefore he was transported to his house in Tarów through his wife's intercession. He died on 18<sup>th</sup> April 1926. The cause of death was liver cancer. He is buried in the Old Cemetery in Tarnów in the Dzikowscy family tomb.

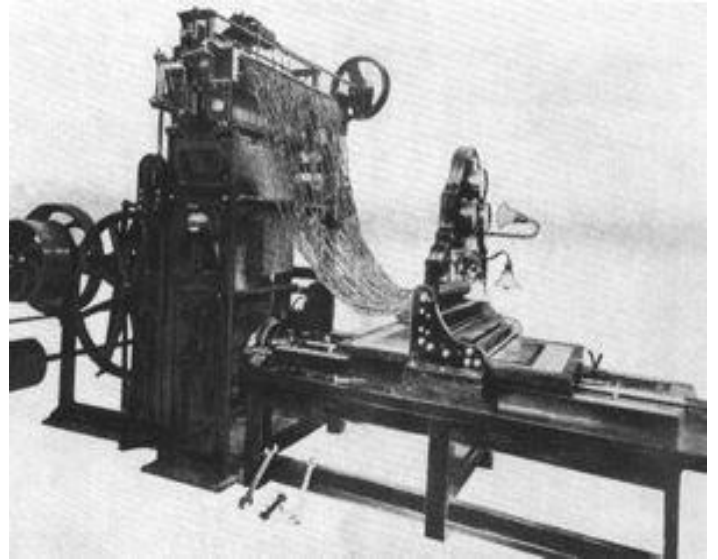


**Szczepanik with his family**

# Jan Szczepanik's inventions

## The weaving machine – work of a few days done in half an hour

Before Szczepanik made some changes to his weaving machine, it was hard to operate the machine and the process of weaving was time-consuming and was exceptionally costly. Making patterns caused the most difficulties. This process was long and tedious. There was a special person who had to make patterns with holes, marking the places where the thread was supposed to go. Szczepanik invented a device which enabled moving the fabric



on the pattern in a way similar to the one used in photography. Owing to it, the pattern was easily and quickly obtained. In addition, he simplified the process of moving images of patterns onto the Jacquard cards (elements of the weaving machine). He used electromagnets in his machines.

# Colorful photography

Szczepanik had been interested in photography since the beginning of his career, however, it became secondary to other activities. Experimenting in this field, he always thought about the common man using it and thus his invention was easy to use and accessible. In 1899 he patented in Great Britain a method of processing miniature colour film, though he did not research further into the subject and considered it of little use. Meanwhile, in 1922 the Kodak company adapted Szczepanik's patent and started the production of photographic film. In 1902/1903 Szczepanik elaborated the method of photography which was based on using filters. He invented color-sensitive photographic paper. By introducing three filters: green, red, blue and black and white film tape into photographic devices, he managed to obtain natural colors in photos. In 1906 he modernized a colorimeter – a device used to measure the intensity of colors.



**The first colorful picture**

# Sound film – Goodbye to tapers in movie theaters

In the times of Jan Szczepanik, the cinema was an exceptionally popular form of mass entertainment. Films were mute and the sounding was based on the play of the pianist (taper) or an orchestra. Alternatively both the film and a vinyl record were played simultaneously. Both methods were troublesome: hiring musicians was very expensive and the music from a vinyl record was difficult to synchronize with the picture. Scientists working on a sound film decided to attempt to record sound on a film tape as the so called soundtrack. Szczepanik joined the stream of experimentations. His attempts in that field were pretty successful. In addition, he also eliminated the problem of “heaviness” of camera elements and the projector which caused delays in the sound emission in relation to the images.



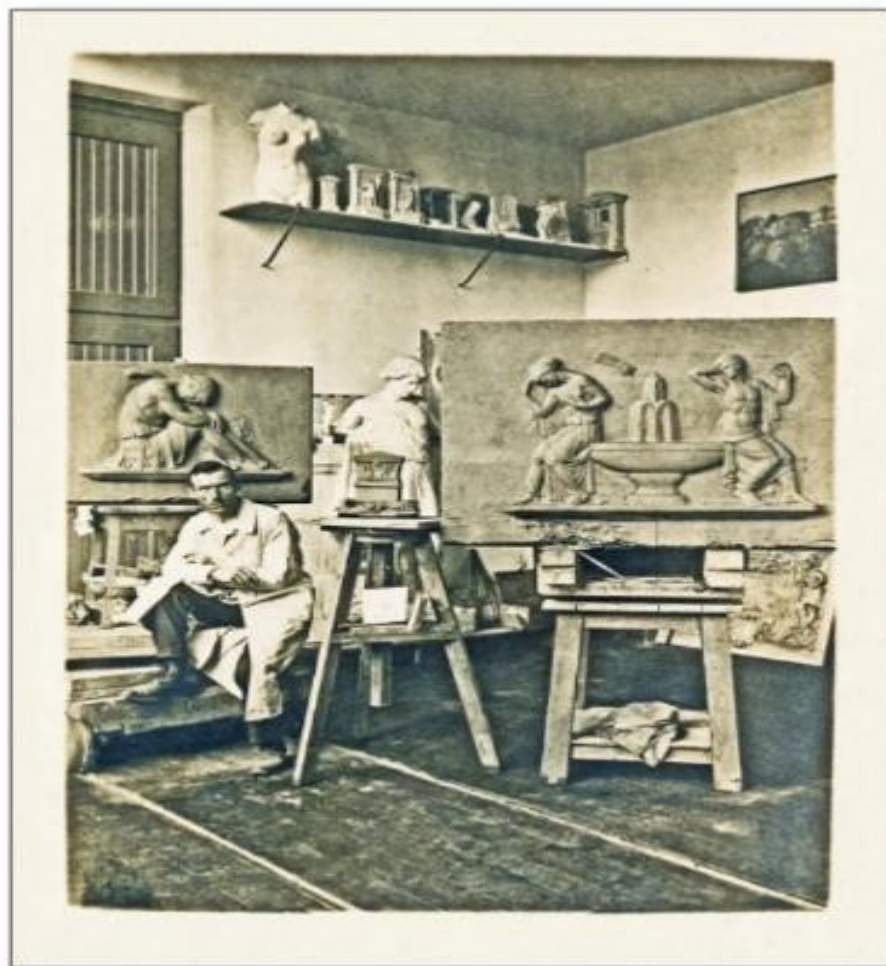
Narodowe Archiwum Cyfrowe, sygn. 1-K-12181



# Fotosculptor

Fotosculptor is an interesting device intended for sculptors. It was to help in the perfect modelling of three dimensional shapes. By means of mirrors, the mechanism projected the image of the sculpture and its pattern. The pictures had different colors so that the sculptor could compare if his work of art was in accordance with the original one.

To imagine how this device works, let's assume that we have a figure which we want to copy. By using mirrors, Szczepanik's device would mark a reflection of the sculpture in such a way that it could be easy to see both the sculpture and its copy, one on top of the other. It made it easier to evaluate them to make sure they are the same shape, which would enable the artist to avoid tedious measuring.



# Ballistic vest

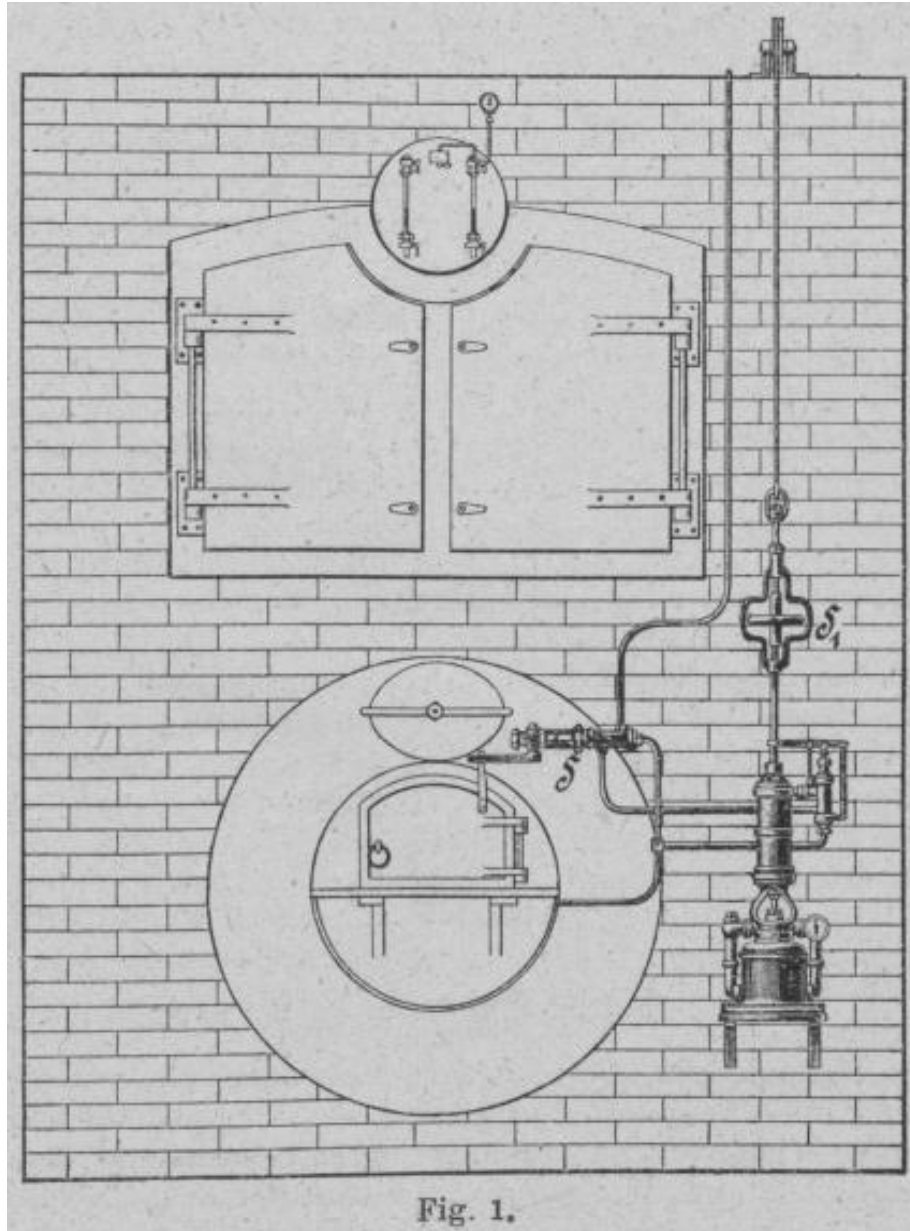
Actually its originator was Kazimierz Żegleń, but Szczepanik created the vest all by himself. It was made of several layers of silk fabric (which was then the strongest known material) and a thin metal strip. It could even stop a bullet from Mannlicher rifle. In 1902 the vest saved the life of the Spanish king, Alfonso XIII of Bourbon. The grateful king awarded Szczepanik an order for his invention.



**The presentation of the ballistic vest**

# Caloridul

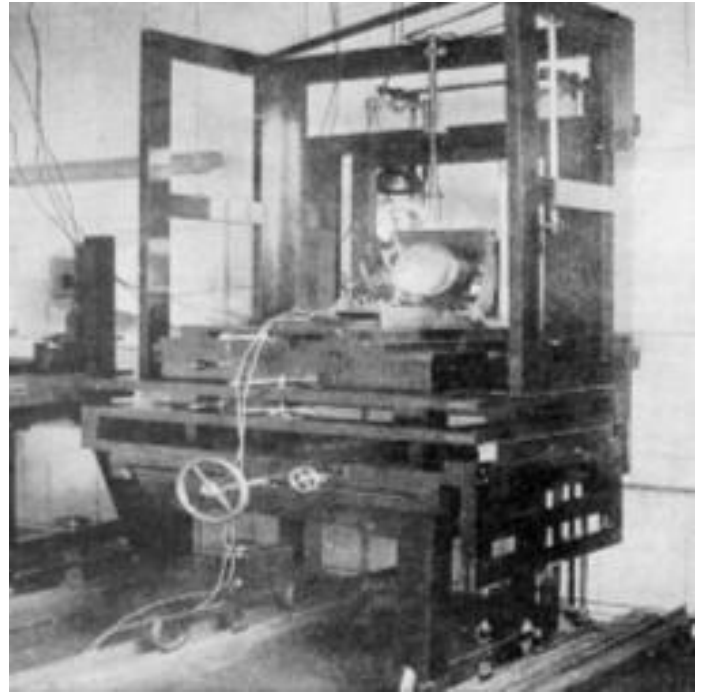
One of Szczepanik's marginal ideas was "Caloridul". It was an automatic regulator of a chimney draft in boiler furnaces. It gave about 20% savings on coal usage in steam boilers.



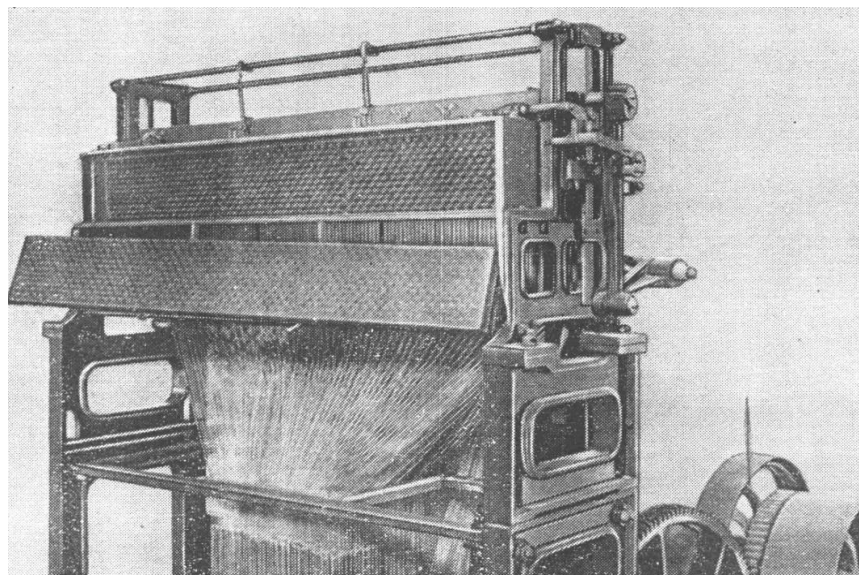
Caloridul

# Jan Szczepanik's influence on industrial improvement

Jan Szczepanik gave up his job as a teacher for the idea of inventing something new, and to hand down his knowledge to society. Thus, he moved to Cracow. There, having devoted to the work on automation of patterned fabric, he used the electro-photo-optical method in making arras fabric for the first time. His solutions evoked admiration because of originality and such incredible creativity. The invention received a great deal of attention and it did not take much time before the first financiers appeared.



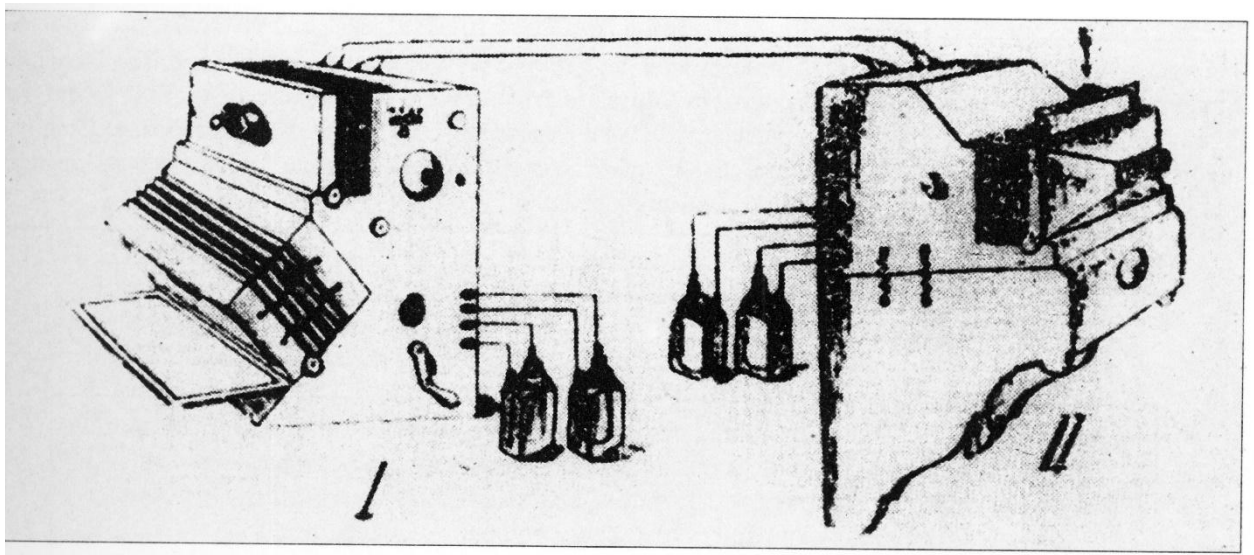
In 1898 a joint-stock company "Societe des Inven-fons Jan Szczepanik Cie" was established in Vienna to explore Szczepanik's inventions. Then, companies were built in Belgium and France, although the majority of the income was not for the inventor, but for financiers. Having not been disaffected, Szczepanik was still working on further inventions and upgrades. Unfortunately, due to speculations led by financiers, the company went bankrupt and Szczepanik was forced to leave Vienna.





He moved in with his father-in-law in Tarnow. The weaving invention of Jan Szczepanik evoked a lot of interest around the world. The possibility of decreasing time of production and producing complex pictures onto arras, engaged the European producers. The industrial domains of almost the whole world got interested in this weaving invention. His surname became etched into the past.

Not only were the arrases Szczepanik's invention. That ingenious researcher and inventor was a forerunner of today's television. It was in 1897 when he reported an application to the British Patent Office in order to get a patent for a "telectroscope" (a device to reproduce pictures a distance away by electricity).

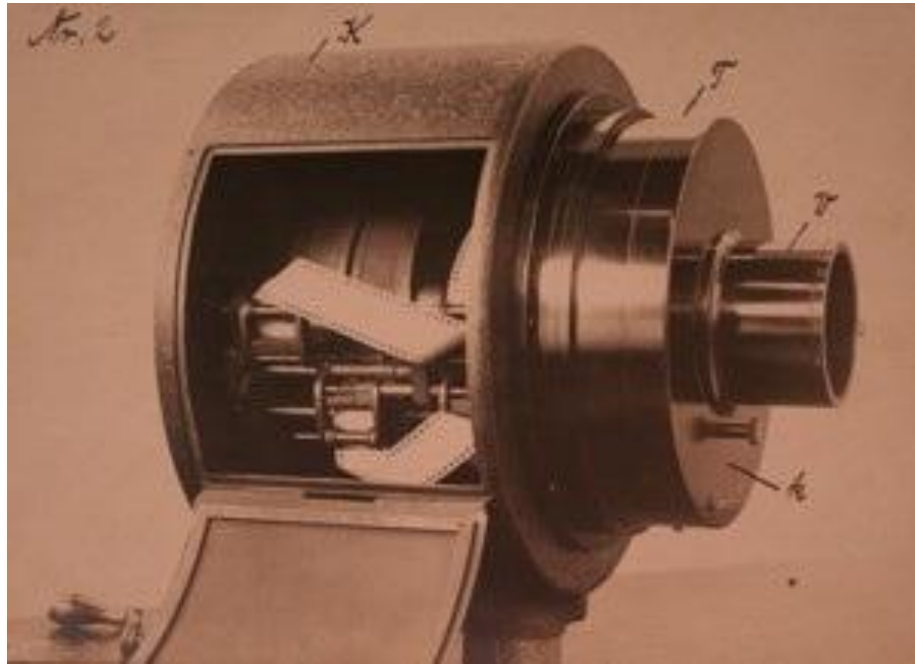


The news on the invention spread around the world and was a tremendous sensation. The First World War and the period after it with all the chaos it involved, made it hard for the inventor to put his idea into practice.

He managed to take colorful pictures in the Swiss Alps, which fascinated people in Basel and Zurich, where they were displayed. Unfortunately, Szczepanik did not have much luck and colourful photography had been developed more quickly by the Americans with their Technicolor system, on which they had spent millions of dollars.



Sad experiences, financial problems and continual work undermined Szczepanik's health. In 1926 he died, not having lived to see the successes of his method of colour filming. His contribution to technology improvement at the turn of XIX and XX century shows that he was a high-class inventor and he is to be placed among the greatest inventors in the history of mankind.



# Jan Józef Ignacy Łukasiewicz

Jan Józef Ignacy Łukasiewicz was a Polish pharmacist, chemist, entrepreneur, the inventor of the kerosene lamp, the creator of the petroleum industry and an independence activist. Ignacy Łukasiewicz was born on 8 March 1822 in Zaduszniki, near Mielec. His parents came from small, poor nobility. He had two sisters and two brothers. In 1830 the family moved to Rzeszów. 2 years later Ignacy entered the local secondary school which was run by the Pijar Fathers. He completed only 4 classes because his family had financial problems. In 1841 he began to work as a pharmacist's assistant in Łańcut and later in Rzeszów. He also became involved in political organizations that supported the idea of restoring the independence of Poland. In 1845 he was appointed the agent of 'Centralization of the Polish Democratic Society'.



A year later Łukasiewicz was arrested for conspiracy activities. On 27 December 1847 he was released from prison due to lack of evidence. He was also ordered to remain in Lwów, where he began working at the 'Pod Żółtą Gwiazdą' (Gold Star) Pharmacy owned by Piotr Mikolasch.



**Mikolasch's Gold Star Pharmacy**

Piotr gave Ignacy permission to leave the city and he began studies at the Jagiellonian University in Kraków. He passed all his university examinations except pharmacognosy which prevented him from graduating. Finally on 30 July 1852 Łukasiewicz received a master's degree in pharmacy at the University of Vienna. After this success, he continued the work in the Mikolasch's pharmacy. He was involved in experiments with crude kerosene distillation and lighting issues. A crucial date in his life is the year 1852. In this year Łukasiewicz, together with his friend Jan Zah, made kerosene by fractional distillation. It is made by a gradual separation of the individual substances by increasing the temperature. Zeh's and Łukasiewicz's success lies in the fact that at the temperature of 200-250 degrees Centigrade seep oil splits into kerosene, and another mixture which contains bitumen and other oils. Then Ignacy tried to find a practical use for kerosene. Oil lamps used up until this time had to be redesigned by Ignacy, because kerosene couldn't be used in them.

Kerosene lamps were first used on 31 July 1853 in a local hospital to illuminate an emergency surgical operation. In early 1854 Ignacy moved to Gorlice to be closer to the oil-bearing areas. In this year he set up the first kerosene street lamp and he created the first kerosene company. The company's objective was to extract the oil and use it in the vicinity of Krosno.



**Galician oil wells**

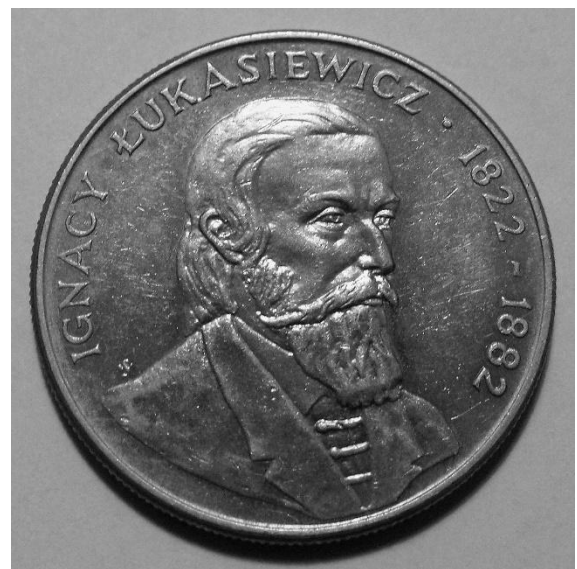


In 1854 Łukasiewicz opened the world's first oil mine in Bóbrka, near Krosno, which has been open until the present day. In 1856 in Ulaszowice, near Jasło, he opened an oil distillery. From the oil he distilled kerosene, asphalt and lubricating oils.

Łukasiewicz provided financial support for various development projects. He established and was the head of the Petroleum Society. His other inventions included: certain manual drills and steam engines, which were constructed in 1862. In 1873 the Pope Pius IX honoured him with the Order of St. Gregory and called him Papal Szambelan. At the end of his life Łukasiewicz was elected to the Galician Parliament. Ignacy Łukasiewicz died of pneumonia in Chorkówka on 7 January 1882. He was buried at the small cemetery in Zręcin.



**Ignacy's tomb at the cemetery in Zręcin**



**The coin with the image of Łukasiewicz**

# Maria Curie- Skłodowska

Maria Curie- Skłodowska was an outstanding scientist truly devoted to her research. She worked on the phenomenon of radioactivity for many years. She discovered two new elements - Radium and Polonium. She was awarded the Nobel Prize twice.

Maria Curie- Skłodowska was born on 7 October 1867. She was brought up in her family house at 16 Freta street. She had three older siblings : Zofia, Bronisława and Józef. Her family's scientific tradition was very strong. Her father was a teacher and a lecturer on Mathematics and Physics and her mother was a supervisor in a school for girls. Their children were being brought up with a respect for science.

Maria was attending a private school, but when her mother died and when their financial situation got worse, she had to move to a Russian middle-school. After graduating from a high-school, she was learning single-handedly. Unfortunately, in her country she wasn't able to continue studying at a higher level so in 1891 she moved to Paris. She had to pay for her studies and sometimes did not even have enough money to buy food. Despite



difficulties, she obtained two bachelor's degrees in Mathematics and Physics. She came back to Warsaw, but not for a long time – she wanted to do research at the Warsaw University but could not as women were not allowed to study there, so she moved to Paris again.

Soon she met Piotr Curie – a professor at the University of Industrial Physics and Chemistry in Paris. Thanks to similar interests – they both were keen on the natural world, they got on well together. Soon they got married. They had two children – Irena, who became a scientist and who was, like her mother, awarded the Noble Prize and Ewa, who has been renowned as her mother's biography writer. In 1897 Maria started doing experimental research as part of her doctoral thesis. The subject of her interests were invisible rays emitted by uranium. At that time her husband Piotr worked on crystals, but his wife's experiments and hypotheses suggesting that there may exist an undiscovered element in the crystals, attracted his



attention so he abandoned his own research and started working with Maria. That task was not easy. They did not have their own laboratory, but worked in an ordinary shed and were using simple equipment. However, their efforts brought results. After three years of gruelling work they discovered Radium- at that time the unknown element whose radioactive features were much stronger than Uranium dioxide.



That success encouraged them to make further scientific efforts, which led them to another discovery – Polonium (named in honour of Maria's fatherland).

In 1903 Maria received an honorary PhD and received the Noble Prize, which was for both her and Piotr owing to the discovery of the phenomenon of radioactivity. In 1906 Piotr died. In spite of the mourning and the loneliness, Maria carried on with her experiments which led her to extract Radium in its

metallic state. Thanks to this discovery she was awarded another Noble Prize. Unfortunately, in 1914 World War I broke out. She had to give up doing experiments for a while to help the injured by providing health assistance and X-ray stations.

After the war she made efforts to extend the Radium insitute. One of her aims was to establish a similar place in Poland and in 1932 the Warsaw Radium Institute was established. It provided medical technology and furthered scientific understanding.

Maria Curie- Skłodowska was the first woman employed as a lecturer at the Paris University. She worked there for 40 years.

Maria died on 4 July 1934. The main reason for her death was a blood illness. After many years spent working with radioactive elements her body had seriously suffered. She was buried with her husband in his family city Sceaux.

Maria Curie- Skłodowska, whose domains were both Physics and Chemistry, was a woman of science who also believed in the power of human values. She said: *“One cannot have the hope to show the world much better direction unless individuals are directed appropriately.”*



# Paweł Edmund Strzelecki



**Paweł Edmund Strzelecki born on 20 July 1797, died on 6 October 1873**

Paweł Edmund Strzelecki was a Polish traveller, geologist, geographer, researcher and explorer. He was born on 20 July 1797 in Głuszyna, near Poznań. He studied geography and geology in Heidelberg and Edinburgh. Since his childhood he dreamed of travelling. He fell in love with Adyna Alekstandryna Katarzyna Turno, but Mr. Turno refused to give him his permission to marry his daughter. In the east of the country Strzelecki administered the great estates of Prince Franciszek Sapieha. He was collecting capital for his expensive travels. In the years 1812-1816 he disappeared from the family home. He was found by chance in Kraków by his older brother Piotr, who was returning from the Napoleonic Wars. Some years later in 1829 the prince Franciszek Sapieha died. Strzelecki received a great fortune which enabled him to travel around the world. The love affair with Adyna ended unhappily, especially their unsuccessful escape. This prompted Strzelecki to leave the country. In 1830 he visited Scotland and England. Then Paweł travelled around Europe. He dealt with the studies of mineralogy, petrography, hydrology and anthropology, ethnography, botany, zoology and agronomy. In 1834 he set out from Liverpool

on a 9-year trip around the Earth. In the years 1834-1835 he led Wildlife Exploration in North America (the Appalachian Mountains, Florida, Mexico). The most important discovery from this period was copper ore deposits in Canada, near Ontario Lake. In South America (Argentina, Peru and Ecuador) he explored various volcanoes and mineral deposits. In 1936 he conducted geological research and meteorological observations in South America (Brazil, Uruguay, Chile). In the western provinces of Mexico, in Hawaii and in the Polynesian islands he explored the volcanoes. The years 1839-1843 were a period of exploration in Australia, New Zealand and Tasmania. During his stay in Australia, he examined the highest mountain range of the continent- the Great Dividing Range. He called the highest peak “Mount Kościuszko” in honour of the leader of the insurrection.



**Mount Kościuszko**

At the top of Mount Kościuszko there are 2 commemorative plaques. The first of them indicates that on 15 March 1840 the Polish traveller Paweł Edmund Strzelecki, as the first white man, reached the highest peak in Australia and called it “Mount Kościuszko”, guided by the similarity of the mountain to the Kościuszko Mound in Kraków. The second of the commemorative plaques was set up by the representatives of the Polish diplomatic post.





**A plaque on the top of Mount Kosciuszko commemorating reaching it by Strzelecki**

On the south-eastern side of the Great Dividing Range Mountains he discovered the land which he called Gippsland. He also discovered the Latrobe Valley, where there are one of the world's largest deposits of coal, oil and gold. Strzelecki also prepared a detailed and accurate geological map of New South Wales and Tasmania. In October 1843, due to poor health, Paweł returned to Europe. In 1844 the Royal Geographical Society in London awarded the distinction "Gold Founders Medal" for Paweł Strzelecki for his discoveries and scientific work. In 1845 in London, Strzelecki published his first scientific work about Australia – "Physical Description of New South Wales and Van Diemen's Land". This work achieved worldwide fame and Strzelecki received a gold medal from the Royal Geographical Society for it. Since 1853 Strzelecki was a member of The Royal Geographical Society of London. In 1860 he was awarded an honorary degree from the University of Oxford and in 1869 he was awarded the Order of St. Michael and St. George. Queen Victoria awarded him twice: as the Commander of the Order of the British Empire and the Commander of the Order of St. Michael and St. George. Strzelecki received the title of lord in the British court because he had discovered the gold deposits in Australia. Strzelecki died of liver cancer on 6 October 1873 in London. He was buried in Kensal Green Cemetery.



In 1997 his remains were transferred to Poland and were placed in the Crypt of the Merit of St. Wojciech Church in Poznań. In 1983 Strzelecki was honoured on a postage stamp depicting his portrait issued by the Australian Post. In Australia – a mountain range, 2 peaks, a lake, a river and a town are named after him.



**Statue of Paul (Paweł) Edmund Strzelecki in Jindabyne in Australia**

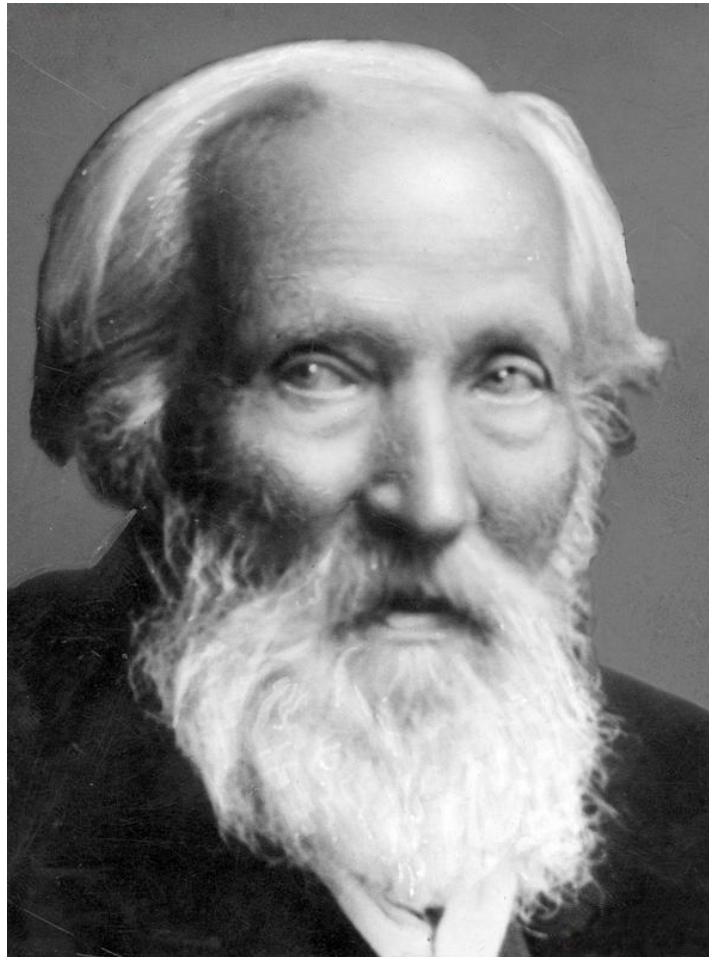


Postage stamp with the image of Strzelecki



Strzelecki's resting place

# Benedykt Dybowski



**Benedykt Dybowski born on 30 April 1833, died on 30 January 1930**

Benedykt Dybowski was a Polish naturalist, traveller, explorer and doctor. He was also a researcher of Baikal Lake, the Far East and Kamchatka, and was a professor at the University of Lviv and the Warsaw School of Economics. He is considered one of the fathers of the Polish limnology. He was born on 30 April 1833 in Adamczyn, near Mińsk (now Belarus) in a noble family. Initially he studied at home. He received lessons from older siblings and a tutor. Later he studied at the Mińsk high school. In 1853 he passed the maturity exam and entered the Faculty of Medicine at the Tartu (Dorpat) University in Estonia. Since 1853 he studied at Wrocław University. In the years 1858-1860 he studied paleontology, botany and medicine in Berlin. There, in 1860, he received the title of doctor of medicine and surgery. He published his first scientific work, which was about the crustacean species that he discovered. In 1861 he returned to Dorpat, where his scientific work about carp fish brought him recognition as an excellent researcher. In 1862 he became a Professor of Zoology at the Warsaw School of Economics. He took an active part in the organization of the January



Uprising as a Commissioner of the National Government to Lithuania and Belarus. On 26 March 1864 he was arrested. He was imprisoned in the X Pavilion of the Warsaw Citadel.



**X Pavilion of the Warsaw Citadel**

He was sentenced to death by hanging. The intercession of the German zoologists saved him. His sentence was later changed to 12 years of exile. He started studying the natural history of Siberia and in 1866 governor Muraviov dismissed Dybowski from hard labour, renewed his civil rights and proposed him to work as a doctor in a hospital. He settled in the small village Kultuk near Baikal.



**Kultuk, near Baikal**

Dybowski, together with his colleague Wiktor Godlewski, began a detailed study of Baikal Lake. Dybowski discovered dozens of new animal species. He discovered 116 species of crustaceans and 6 new species of fish. His brother Władysław discovered 88 species of mollusks and 9 species of sponges. A part of the Dybowski's collection was developed by professors from Berlin, Lviv and Kraków. Dybowski also researched the fauna of the land, especially birds and mammals. His research in eastern Siberia gave him the gold medal of the Geographical Society in Petersburg. In 1868 he participated in the expedition of General Skałkow. In 1876 Dybowski received permission to return to the country, where he appeared a year later. Dybowski also researched the Commander Islands, especially the Bering Islands.

In November 1878 he was awarded the position of the government doctor in Petropavlovsk in Kamchatka. He was fighting against disease epidemics, he founded hospitals for lepers in Kamchatka and introduced vaccinations against smallpox. Using horses and reindeer, he brought the vaccines which he had bought with his own money to Bering Islands to help the people there. The highest peak on Kamchatka was named after him by the local population. In 1884, when he returned from Kamchatka, he was appointed to the chair of zoology at the University of Lviv. In 1906 he retired, but he continued to publish his works. The preparations for the next trip on Baikal Lake were interrupted by the outbreak of the First World War. He was rescued from a second exile. He was a member of the Polish Ethological Society in Lviv.

Dybowski died on 30 January 1930 in Lviv. He was buried in Lviv on the Łyczakowki Cemetery. Most of his collection of zoological and botanical specimens is now in the Lviv Zoological Museum. In February 2014 traveller Jacek Pałkiewicz unveiled a memorial plaque to Dybowski in Petropavlovsk.





The grave of Benedykt Dybowski on the Łyczakowski cemetery in Lviv



A memorial of Dybowski in Petropavlovsk

# Stanisław Działowski



**Stanisław Działowski born on 11 April 1900, died on 19 March 1942**

Stanisław Działowski was a Polish military airman and aerospace designer. He was born on 11 April 1900 in Mielec. He began learning in his hometown. When he was 16, as a volunteer, he joined the Austro-Hungarian army. During his service, he started learning in a school of aircraft building. When on 11th November 1918 Poland regained its independence, Stanisław joined the Polish Army and worked as a mechanic in the Lower School of Aviation in Kraków. In September 1921, together with his brother, he moved to Bydgoszcz. There he completed a pilot course. In 1925 he built one of the first Polish gliders- 'Bydgoszczanka'.



Narodowe Archiwum Cyfrowe, sygn. 1-5-3062-2

**Glider "Bydgoszczanka" on the square**

In the years 1926-1935, also with the help of his brother, sport planes DKD were constructed. Since 1930 Działowski dealt with the idea of joining an airplane with a car-‘aeromobil’ DKD-X, which was never completed due to a lack of finances and ill health.



**Stanisław Działowski next to the airplane DKD-4**



Within a few weeks non-commissioned of II and V Corps District raised almost 20 000 zlotys for the construction of the first 'aeromobil'. The prototype was to be built in the summer of 1933 in Dębica. In 1935, due to poor health, Działowski retired. For 2 years he ran his own company, which produced parts for gliders. He was the technical director of the School of Pilots LOPP in Stanisławowo and he was an employee of the Airframe Plant in Warsaw and Mielec. After the outbreak of World War II, he escaped to France. There he trained the Polish pilots. When France became occupied by German forces, Działowski moved to the UK, where on 27 June 1940 he was admitted to the RAF. On 15 October 1941 he was wounded in combat and he was sent to a military hospital in Scotland and had further treatment at a state hospital. Stanisław Działowski died in Perth on 19 March 1942. He was buried at the local Wellhill cemetery.



Narodowe Archiwum Cyfrowe, sygn. 1-G-959-1

**Stanisław Działowski in the middle. At the back- the silhouette of Działowski's microlight aircraft DKD IV**



# Stanisław Wigura

Stanisław Wigura (9 April 1903 - 11 September 1932) was a Polish aircraft designer and aviator, co-founder of the RWD aircraft construction team and lecturer at the Warsaw University of Technology. Along with pilot Franciszek Żwirko, he won the international air contest Challenge of 1932.

Stanisław Wigura was interested in mechanics and aviation in his youth, and he was also an active scout. In 1920, during the Polish – Soviet War, he volunteered for the 8th Field Artillery Regiment. Wigura was one of the founders of the Aviation Section of Students' Mechanical Club, where he met a.o. Stanisław Rogalski and Jerzy Drzewiecki. In December 1925 Rogalski, Drzewiecki and Wigura founded their own workshop, where they built an aircraft. In 1926, Wigura and Rogalski designed their first light aircraft WR-1, built in 1927. In 1927, three designers: Wigura, Rogalski and Drzewiecki started working together, creating the RWD team (it was an acronym of their names) . At first they built sportsplanes, (RWD-1, RWD-2) which were used in the Polish sports aviation, with some success.



Wigura himself became active in sports aviation. It was thanks to his friendship with pilot Franciszek Żwirko. They often flew together (Wigura as a mechanic and the second pilot). Between August 9 and September 6 1929, Żwirko and Wigura flew on the RWD-2 prototype across Europe on a Warsaw-Paris-Barcelona-Milano-Warsaw route of 5,000 kilometres. On October 6th they won an award from the airforce of South Western Poland. During September and October 1930, they won two flying contests, flying an RWD-2 and an RWD-4 and in September 1931 they won another one, flying on a prototype RWD-5.

In the meantime, Wigura with others, designed another modern sportsplane (RWD-6), that was intended for the International Tourist Plane Competition, which took place in August, 1932. They won the competition, over the heavily favored Germans and the other teams, and they both became heroes in Poland.



On 11 September 1932, while flying to an air meeting in Prague, Żwirko and Wigura fatally crashed in their RWD-6 in a forest in Cierlicko near Cieszyn, when the wing broke in a heavy storm.

Stanisław Wigura was awarded the Knight's Cross of the Order of Polonia Resituta and the Polish Gold Cross of Merit.

# Franciszek Żwirko

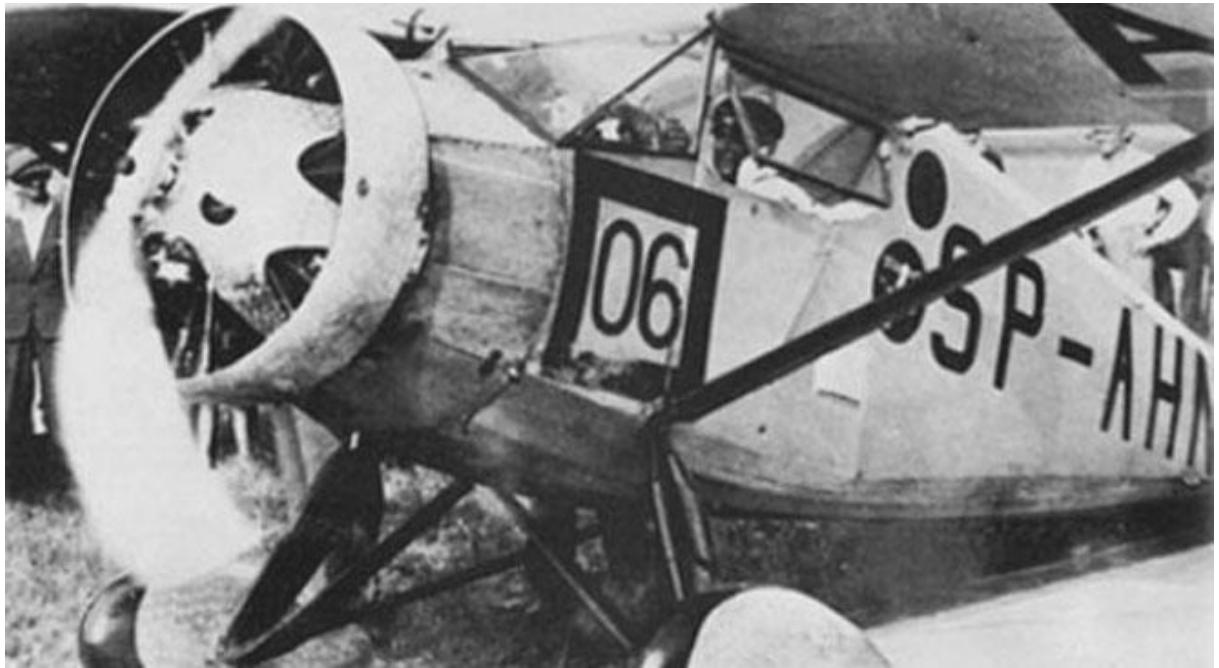


Franciszek Żwirko - (16 September 1895 – 11 September 1932) was a prominent Polish sport and military aviator. From 1929 he was assigned as a liaison officer in the University Aeroclub (*Aeroklub Akademicki*) in Warsaw. He was assigned as a training squadron commander in an aviation school in Dęblin.

From 1929 Żwirko and Wigura often flew together, Żwirko as the first pilot and Wigura as a mechanic and the second pilot. On October 6 they won a Polish air race. In July 1930, Żwirko and Wigura took part in the International Tourist Plane Competition (Challenge 1930), flying the RWD-4. During September and October 1930, they won in two Polish contests, flying an RWD-2 and RWD-4, and in September 1931, they won another one, flying on a prototype RWD-5. In 1932 they won the international air contest Challenge.

On 11 September 1932, while flying to an air meeting in Prague, Żwirko and Wigura fatally crashed in their RWD-6 in a forest in Cierlicko near Cieszyn, when the wing broke in a heavy storm.

The two pilots were buried in the Avenue of the Meritorious in Powązki Cemetery in Warsaw.



**Franciszek Żwirko in RWD-6**



**Franciszek Żwirko and Stanisław Wigura**



# Ignacy Domeyko

Ignacy Domeyko was born in 1802 in Niedźwiadka Wielka, Poland. He died in 1889 in Santiago, Chile. He was a geologist, mineralogist, mining engineer and educator. He was descended from the gentry of Dangieli crest. His father Hipolit died early and his paternal uncle took care of Ignacy and his mother Caroline. His uncle was the one who brought about his interest in mineralogy. It deepened while studying at the Vilnius University.

In the years 1816 – 1822 he was studying multiple subjects at the Faculty of Mathematics and Physics including chemistry, physics, maths, astronomy, natural history and mineralogy.

It is important to mention that in Domeyko's time, Poland was undergoing annexations. Its effect was such that he and many other leading Poles decided to join one of the secret organizations aiming at freeing Poland. He joined the Philomath Association where, despite his youth, he was chosen to be the leader of the environmental department. After finishing college Ignacy Domeyko took over Zapole manor. The people found him to be a good landlord. Because of his subversive activity in the Philomath Association, an investigation was initiated against him and he was arrested. Thanks to his uncle the sentence was not very strict. He was relegated from the tsarist service and had to stay under police supervision. Domeyko never got rid of this burdensome limitation.

In 1831 the November Insurgency began. Domeyko joined the insurgents and was assigned to deliver information to a commander, but he failed. He came close to death when he was recognized as a spy, but was saved by a priest. Pretending to confess Ignacy before the execution, he helped him to escape. After that Domeyko fought in other battles with famous Poles such as Emilia Plater and Karol Marcinkowski. When they lost, he emigrated to East Prussia and started as an exile. He managed to get to France where he stayed until he received a letter from professor Armand Dufrénoy in which he was offered the post of Chemistry and Mineralogy lecturer in Coquimbo, northern Chile. He was promised to have a high salary and to be reimbursed for any travel costs. Domeyko accepted.

He came to Coquimbo on June 3<sup>rd</sup> 1838 after four months of travel. He created a basis for the exploitation of mineral wealth.



Domeyko was teaching students of the mining school, lecturing on the basics of chemistry and physics and on mineralogy and metallurgy. In the meantime he was doing the analysis of ore samples collected by himself and also sent by mine owners. He gained the appreciation of the authorities and was appointed to be a mining policy maker in government. His sentences were final and there were no appellations.

During his holidays he travelled around the country, especially in the Andes. His descriptions from these travels are, even nowadays, a source of precious information. He always sent the results of his research to the university of École des Mines, which was his primary university in Chile. He sent the collections of minerals and reports. He gave talks on his reports in the Science Academy and published the reports in the “Annales des Mines”.

He wanted to come back to France and keep the people abreast with news from Chile. Unfortunately the fire of his laboratory in Coquimbo made him stay there for a year longer to help rebuild the lab. He left the town in 1846 but the government asked him to stay in the country to help the reforming of the university. Another reason for delaying departure was the fact he wished to study Antuco volcano which was a live volcano at the time. In Santiago, Domeyko became the professor of chemistry, physics and mineralogy.

In 1848 the parliament gave him Chilean nationality. He later married Henriette de Sotomayor. Despite the fact she was very much younger than Ignacy, they were very happy together. They had had two children – Anna and Herman.

Domeyko wrote the textbooks “*Tratado de ensayes*” and “*Elementos de mineralogia o del conocimiento de las especies minerales en jeneral i en particular de las de Chile*”. In these books many minerals were documented for the first time, inter alia domeykite which was named after him by Wilhelm Ritter von Haidinger. Domeyko discovered over 4,000 minerals altogether. He was not fascinated only in mineralogy and geology. He was also analyzing meteorites collected in the Atacama desert. He surveyed earthquakes in Chile and created the metrological network in the country.

As time went by, Domeyko was becoming absorbed more and more by organizing the education system in Chile. Thanks to him Universidad de Chile became a modern establishment like the Vilnius University. Since 1867 he was its rector for 16 years.

In 1884 he finally managed to come back to Poland despite the fact it was still undergoing annexations. In 1887 the Jagiellonian University granted him title of doctor *honoris causa*. He returned to Chile after a journey lasting two months and Domeyko fell ill. After a few weeks he seemed to start to recover, but a couple of days later he died. All of Chile was in mourning. The government paid for his funeral.

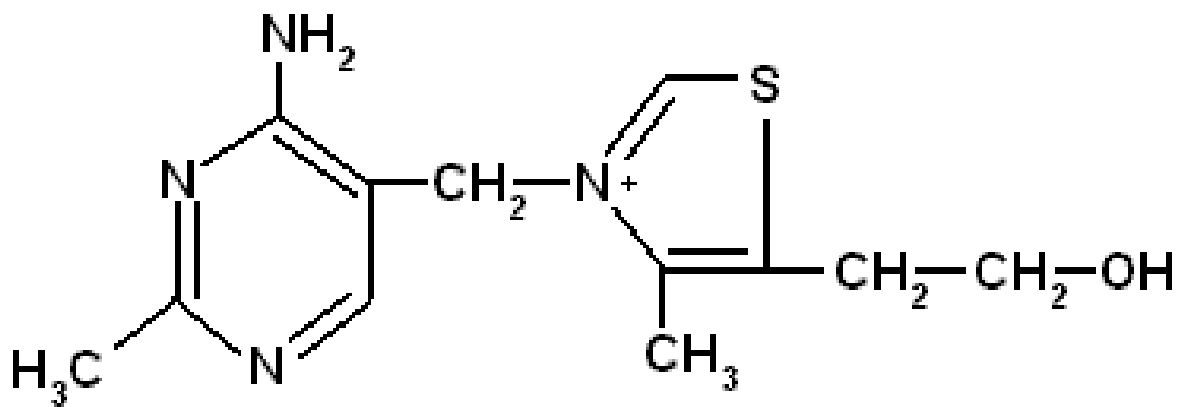
The heritage Domeyko left is very important for Chile. Thanks to him, mining in Chile expanded hugely, which led to the independence and economic development of Chile. He also improved the system of education.

# Kazimierz Funk



Kazimierz Funk was born on 23 February 1884 in Warsaw. He died on 19 January 1967 in New York City. He was the creator of the science of vitamins.

At age 16 he graduated from a high school in Warsaw. Then he went to Switzerland, where he studied biology. Later he studied also in Berlin. In subsequent years Funk worked at the Pasteur Institute in Paris and later at the University of Berlin and the Lister Institute in London. In the UK he dealt with the discovery of the cause of a disease called beri-beri. He discovered and isolated from rice bran the first vitamin, vitamin B1. His further studies have detected this vitamin in yeast, milk and bovine brain. In 1912, Funk coined the term "vitamin". He believed that vitamin deficiency contributes to certain diseases, for example rickets, scurvy and pellagra.



**Witamina B<sub>1</sub>**  
**(Tiamina)**

The discovery of vitamin B1 inspired researchers to look for other compounds to prevent diseases caused by deficiencies in the diet. It turned out that vitamins are very different from each other in chemical structure. After the outbreak of World War I Kazimierz moved to the United States to conduct research into the use of vitamins for medicinal purposes. He returned in 1923. In the years 1923-1928 he led the biochemistry division of the National Institute of Hygiene in Warsaw. While he was in Poland, he was dealing with research which was related to the effects of vitamin B1 on carbohydrate metabolism and he was also studying nicotinic acid.

In 1928 he again went to Paris, where he conducted research on hormones. In 1939 he emigrated to the United States again, where he spent the rest of his life. He didn't have time to complete his research on the causes of cancer, but he left more than 200 scientific papers behind.



# Rudolf Weigl

Rudolf Stefan Weigl was born on September 2, 1883 in Prerov and died on August 11 1957 in Zakopane. He was a Polish biologist and the inventor of the first effective vaccine against typhus fever. He also adapted insects, mainly human cloth lice, to serve as laboratory animals to culture typhus germs.

After finishing his education in secondary schools in Jaslo and Stryj, he enrolled at the Lwów University to study Biological Sciences. During the First World War he was enlisted to the army as a parasitologist. Then Weigl started his scientific research into typhus fever, a wide-spread disease at that time, and the role of human cloth lice in spreading it.

His in-depth research resulted in developing the first effective vaccine against this disease. Weigl decided to use human cloth lice as an experimental animal but its small size hindered the progress of his research.

Weigl developed a method of infecting the lice artificially so that he could propagate the *Rickettsia prowazekii* bacteria in the bodies of the insects.

Rudolf Weigl was awarded for his achievements many times, and he was also nominated twice for the Nobel Prize.

Typhus fever is an infectious disease triggered by bacteria and carried by lice. The *Rickettsia prowazekii* bacteria along with infected lice excrements get into the human body through damaged skin.

The highest typhus fever incidence was reported during wars and natural disasters, particularly in the periods of famine.

The infected suffer from the disease from 4 to 8 weeks. The symptoms of typhus fever include:

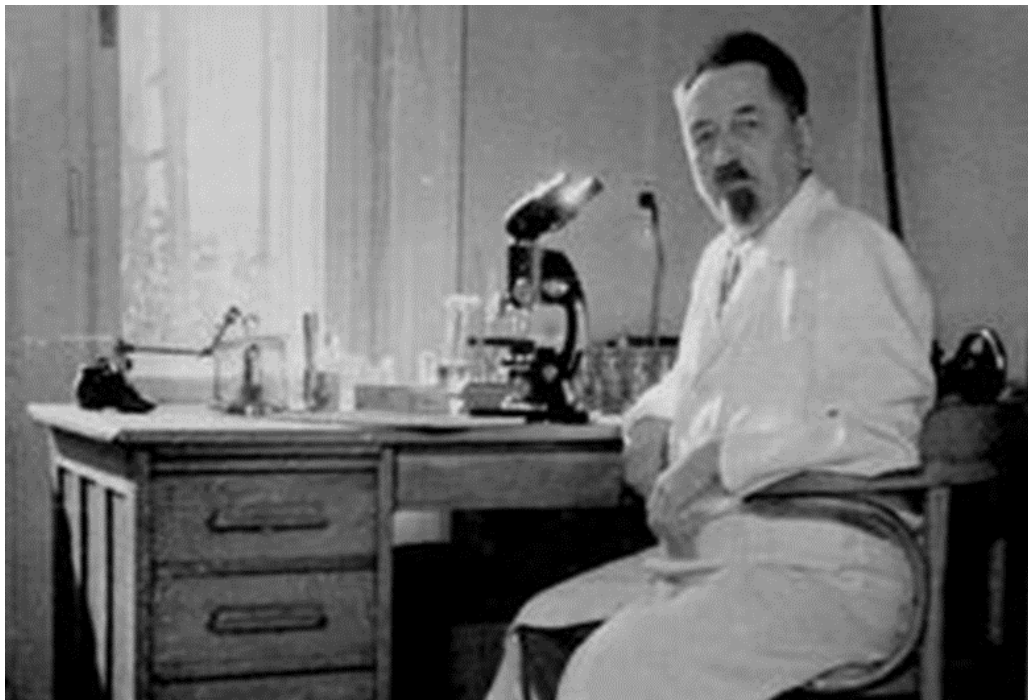
- high fever
- shivering
- nausea
- vomiting
- headache

The stages of the vaccine production:

1. The lice were bred in special wooden cages with a screen. Lice were only able to stick out their heads through this screen, but were not able to escape.
2. The cages were fixed to human legs (calves or thighs). The screen walls of the cages were pressed against the skin. Sticking out their heads through the screen wall, the lice suck blood for about 30- 45 minutes, once a day, for about 12 days.
3. After 12 days the lice were infected with the *Rickettsia prowazekii* bacteria. The insects were held by Weigl's clamp and infected with the bacteria using a fine glass microcapillary.
4. The *Rickettsia*-infected guts were pulled out of the lice and transferred to jars containing a solution where they formed some suspension. The suspension was used to make the vaccine.

Weigl's vaccine stopped the disease from spreading worldwide. At present, typhus does not appear to be of any major epidemiological importance.

Weigl's dissertations, articles, photographs and his laboratory equipment were donated to the museum in Przemyśl by his friends, including professor Stefan Kryński.



# Zbigniew Religa

Zbigniew Religa was born on 16 December 1938 and died on 8 March 2009. He was a prominent Polish cardiac surgeon, politician, senator of the Republic of Poland and also the Health Secretary. Zbigniew Religa was a member of the International Chapter of the Order of Smile in Warsaw.



He studied medical science at the Medical Academy in Warsaw. After finishing his studies in 1963, he worked as a doctor in a hospital. From 1966 to 1980 he worked in the *Szpital Wolski* in Warsaw. He got the I and II degree of specialization in surgery while working as a doctor.

In 1973, he visited New York to train in vascular surgery, in 1975 he trained in cardiac surgery in Detroit. In 1973, he obtained a Ph. D. degree. In 1981 he finished his habilitation, achieving academic recognition. From 1980 to 1984, Religa lectured at the Warsaw Institute of Cardiology. In 1984 he obtained a chair in cardiac surgery and directed the Cardiosurgical Clinic in Zabrze. In 1990 he became full professor at the Silesian Medical University in Katowice and was its rector from 1997 to 1999. In 2001 he returned to Warsaw to become director of both the Clinic of Cardiac Surgery No. 2 and the Institute of Cardiology.

Zbigniew Religa was a pioneer in human heart transplantation in Poland. In 1987 he led the team of doctors that performed the first successful heart transplant. The patient was Tadeusz Żytkiewicz. The surgery lasted for 23 hours.

After the surgery an American photographer, James Stanfield from National Geographic, captured the famous, gripping photograph of Religa monitoring his patient's vitals on outdated medical equipment, with one of his colleagues who assisted him during the surgery asleep in the corner.



In June 1995 Religa was the first surgeon to graft an artificial valve created from materials taken from human corpses. In 2004, a team led by Religa obtained a prestigious *Brussels Eureka* award at the World Exhibition of Innovation, Research and Technology for developing an implantable pump for a pneumatic heart assistance system.



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