

The role of accidental discoveries in the history of science

term paper sample

[Science](#)



**ASSIGN
BUSTER**

Best phrase that anticipates a new discovery is not "Eureka!" but "Wow, cool!"

Throughout the history of science, many discoveries have been made by accident. Sometimes the researcher saw the potential in a completely irrelevant thing, or even in the remnants of a failed experiment, making a mistake a manifestation of intuition. Other discoveries took place after a period of despair that engulfed the scientist following a failed experiment. As a result of an error or "unfortunate" coincidence of circumstances, there appeared not a single discovery, but a large set of findings, ideas and discoveries in various fields of science

Penicillin. The penicillin was discovered in 1928. The author of the accidental invention was Alexander Fleming, who, at the time, was engaged in the study of influenza. According to a legend, Fleming often did not bother to wash glassware immediately after the experiments. Thus, he could store a virus of flu for 2-3 weeks in 30-40 cups simultaneously. In one of the cups the scientist discovered mold, which, to his great surprise, destroyed the sown culture of staph bacteria. This aroused Fleming's interest: it turned out that mold, which has infected culture, belongs to rare species. Most likely, the mold got into the lab from the room downstairs; that is where mold samples taken from patients with bronchial asthma were grown. Fleming left the cup on the table and went on vacation. Then came a snap of cold snap in London, which created favorable conditions for mold growth. It later turned out that warm weather also favored the growth of bacteria, and it is exactly the set of a coincidence which gave birth to this important discovery.

Penicillin helped and is still helping to save the lives of millions of people.

People paid tribute to the scientist; after his death Fleming was buried in St. Paul's Cathedral in London, on a par with the most famous British in history. In Greece, the day of Fleming`s death is even declared a national mourning day. (Roberts & Royston, 1989)

X-Rays. The author of 1895 discovery was a renowned German physicist Wilhelm Conrad Roentgen. The scientist conducted experiments in a darkened room, trying to figure out whether cathode rays discovered only recently, can go through a vacuum tube. By changing the shape of the cathode, Roentgen accidentally saw on chemically cleaned screen at a distance of a few pounds a blurry greenish cloud. The impression was that weak flash from the induction coil could be reflected in a mirror. This effect has fascinated the scientist so much that he devoted seven weeks to experiments, practically without leaving the lab. The results showed that the luminescence arises from the direct rays emanating from the cathode-ray tube. The very same light gives shadow, and it cannot deviate magnet. After applying this effect to a human, it became clear that the bones cast a denser shadow, compared with the soft tissue. This effect is still used in fluoroscopy. On the same year came the first X-ray photo. Roentgen made a picture of the arms of his wife: a gold ring on his wives` finger was clearly seen on the picture. Thus, a woman became the first subject of experiment: finally, men were now able to see through women. At that time, nobody knew about the dangers of radiation; there were even photo studios where they made single and family x-ray pictures. (Roberts & Royston, 1989)

Vulcanized rubber. In 1496, Columbus brought back from the West Indies a wonderful thing - the rubber balls. At the time, this thing seemed like magic,

but was quite useless. Besides, rubber had its drawbacks - it stank and rotted quickly, and when overexposed to heat, it became too sticky and became too hardened in the cold. No wonder that people for a long time could not find a way to use rubber. Only 300 years later, in 1839, this problem was solved by Charles Gudirom. In a chemistry lab, this scientist tried to mix the rubber with magnesia, nitric acid, and lime, but it was all to no avail. An attempt to mix the rubber with sulfur also ended in failure. Then, he accidentally dropped the mixture onto a hot stove. Thus appeared a solid rubber, which is now everywhere around us. (Roberts & Royston, 1994)

Cellophane. In 1908, Swiss chemist Jacques Brandenberger, who worked in the textile industry, sought to create a coating kitchen linen, which would protect from stains. Designed as a hard coating viscose it was too unsuitable for this goal, but Jacques believed in the material, suggesting to use it for food packaging. However, the first machine for the production of cellophane came after only 10 years - that is how much time it took the Swiss scientist to implement his idea. (Roberts & Royston, 1989)

Safety glass. Today, such a combination of words is not surprising, but in 1903 it was very different. French scientist Edouard Benedictus once dropped on his foot an empty glass flask. To his great surprise, utensil did not broke; the walls were covered with mesh cracks, but the shape remained intact. The scientist tried to find out what caused this phenomenon. He discovered that the flask contained a solution of collodion, which is a solution of cellulose nitrate in a mixture of ethanol and ethyl ether. Although the liquid has evaporated, a thin layer of it remained on the walls of the flask. At this time, France was actively developing the automotive industry. Then the

windscreen was made of ordinary glass, which resulted in many injuries both for drivers and passengers. Benedictus realized how his invention can be used in this area. However, the cost of implementation has been so great that it was put off for decades. Only after World War I, during which a safety glass was used for gas masks, triplex safety glass received the application in the automotive industry. (Krols, 2012)

LSD. Accidental discovery of diethylamide d-lysergic acid led to a cultural revolution. Few people today can dispute this fact as a hallucinogen, discovered by Swiss scientist Albert Hoffman in 1938, largely contributed to the formation of the hippie movement in the 60s. The interest in this drug was huge; it also had a great impact on the research and treatment of neurological diseases. Dr. Hoffman discovered LSD as a hallucinogen while engaging in pharmaceutical research in Basel, Switzerland. Doctors were trying to create a drug that would facilitate the pain of childbirth. During the synthesis of what was later called LSD, Hoffman did not initially find in the substance any interesting properties so he decided to put it in storage. The true properties of LSD were detected only in April 1943, when Hoffman worked with the substance without gloves, and some part of it infiltrated his body through the skin. When Albert was driving home on his bike, to his surprise, he saw " an uninterrupted stream of fantastic pictures, extraordinary shapes with intense and kaleidoscopic play of colors."

(Lapham`s quarterly) In 1966, LSD became prohibited in the United States: the ban spread to other countries, which greatly complicated the study of hallucinogen. One of the first researchers was Dr. Richard Alpert, who said that by 1961, he was able to test LSD on 200 sites, 85% of whom said that

they had received the most rewarding experience of their lives. (Krols, 2012)

Pacemaker. Among accidental inventions of humankind, there were also a number of devices. Among these devices the discovery of pacemaker, which helps to save the lives of millions of people suffering from heart disease, was particularly important. In 1941, an engineer John Hopkins was doing research on hypothermia on the orders of the Navy Commandment. He was given the task - to find a way to maximize the heating process of those exposed to cold weather or icy water for a long time. To resolve this issue, John attempted to use high-frequency radio waves that heated the body. However, he found that cardiac arrest due to hypothermia can be restarted through stimulation by means of electrical impulses. This discovery led to the emergence in 1950 of the first pacemaker, although it was rather bulky and heavy, and its use sometimes resulted in the formation of burns and scars. The second accidental discovery in this area belongs to the physician Greytbatchu Wilson. He tried to create a device to record heart rhythms. Once he accidentally put the wrong resistor into his device and saw the fluctuations of electrical network, similar to the rhythm of the human heart. Two years later, there appeared the first implantable pacemaker that produced artificial impulses that stimulate human heart. (Krols, 2012)

Microwave. In this case, an entirely different device was invented. In 1945, American engineer Percy Spencer created the magnetrons. These devices were generating microwave radio for the first radars. After all, they have played an important role in World War II. But the fact that microwaves can help to cook was opened accidentally. One day, when standing near the

working magnetron, Spencer noticed that chocolate bar melted in his pocket. The mind of the inventor quickly realized that the microwaves were to blame for this unfortunate accident. Spencer decided to experiment by trying to expose popcorn and an egg to microwaves: as expected, popcorn and egg exploded. The benefit of microwaves was obvious, and with time, a first microwave oven was produced. At the time, it weighed about 340 kilograms and was the size of a modern refrigerator. (Roberts & Royston, 1989)

Garbage bag. Humankind invented garbage bags only in 1950. One day, Harry Vasilyuk, an engineer and inventor, received a request from his local municipality to solve a problem of garbage spill when loading garbage trucks. Vasilyuk spent a lot of time in attempt to design a device that operates on the principle of a vacuum cleaner. But then, a different idea struck him. According to the story, one of his friends said, " I need a bag for trash". Then Vasilyuk realized that for the operations with garbage one should use only disposable bags, which he proposed to make out of polyethylene. At first, these packages were used in Canadian hospitals in Winnipeg. The first trash bags for individuals appeared only in the 1960s. (Roberts & Royston, 1994)

References

- Roberts, Royston M. (1989) Serendipity: Accidental Discoveries in Science. New York: Wiley.
- Roberts, Royston M, and Jeanie Roberts. (1994) Lucky Science: Accidental Discoveries from Gravity to Velcro, with Experiments. New York: John Wiley,
- Krols, Birgit. (2012) Accidental Inventions: The Chance Discoveries That Changed Our Lives. San Rafael, CA: Insight Editions.

<https://assignbuster.com/the-role-of-accidental-discoveries-in-the-history-of-science-term-paper-sample/>

Exploring an Alternate Universe, Lapham`s quarterly, Retrieved from
<http://www.laphamsquarterly.org/intoxication/exploring-alternate-universe>