24 Unintended Scientific Discoveries - mental_floss on YouTube (Ep. 35)

List Show
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https://nerdfighteria.info/v/YgdDQWW-7gE

Hey, I'm Derek Muller, this is Mental Floss, and today, I'm going to tell you about all sorts of important scientific discoveries and inventions that happened by accident. Sometimes it was a case of searching for one thing and finding another, and other times it was as simple as forgetting to wash your hands. The most famous of these accidental inventions is, of course, penicillin, and we'll get to that, I promise. But first, I want to start where all serious scientific list shows should--with Viagra.

[Intro music]

1. In the early 1990s, Pfizer was testing out a drug called UK92480, intended to treat patients with angina, a common precursor to heart attacks, involving the constriction of blood vessels that supply the heart. The company was hoping the drug would relax the blood vessels. Mm, it failed in that regard, but test subjects reported some fascinating developments below the belt, and so became the little blue pill known as Viagra, a side effect of which is--wait for it--heart attacks.

2. In 1907, Belgian chemist Leo Baekeland was trying to find a replacement for shellac--that's an expensive resin secreted by a South Asian beetle--when instead he produced the world's first plastic. By combining formaldehyde with phenol, which is a waste product of coal tar, and mixing in other materials, Baekeland accidentally created a non conductive and heat resistant polymer that is used in pretty much everything you see around me right now. Now, a paragon of modesty, he named the plastic "Bakelite" in honor of himself.

3. You know what else is a derivative of coal tar? Saccharin, of course. And the discovery of the world's first artificial sweetener happened because Russian chemist Constantin Fahlburg forgot to wash his hands. In 1879, after a day spent reacting coal tar with phosphorous, ammonia, and other chemicals, he realized at home that his hands tasted sweet. Sweet'N Low, that is.

4. The microwave oven was invented in 1945, when a Raytheon engineer named Percy Spencer was fiddling with energy sources for radar equipment. Then, he realized that the chocolate bar in his pants was melting. He celebrated his discovery with pocket fondue.

5. Now, speaking of radiation, it was German physicist Wilhelm Röntgen who discovered X-rays in 1895. But, not on purpose. He was experimenting with cathode ray tubes when he noticed a strange glow in his dark lab some distance away from the tube. Now Röntgen expected a new type of radiation was responsible, and so he called them "X-rays," X for unknown. They could pass through paper, wood, and yes, even skin, so Röntgen took the first medical X-ray--of his wife's hand. Now upon seeing the image, she said "I have seen my own death!" Happy anniversary, honey.

6. Now, X-rays caused such a stir in the scientific community that another accidental radiation discovery soon followed. In France, 1896, Antoine Henri Becquerel was testing the hypothesis that sunlight could excite uranium to cause it to emit X-rays, and these X-rays would expose photographic film. But in this case of scientific serendipity, a few cloudy days forced Becquerel to leave his experiment inside in a closed drawer. Now developing the film anyway, Becquerel was startled to find the film had been exposed, and he realized that the uranium itself was emitting this invisible radiation.

7. Okay, new category: how about vulcanized rubber? In 1839, none other than Charles Goodyear accidentally dropped a mixture of rubber, sulfur, and lead onto a hot stove. The mixture hardened, but was still usable, and the world finally had a durable rubber resistant to both heat and cold.

8. Robert Chesebrough was looking to strike it rich in the oil fields, but in 1859 he noticed workers complaining about rod wax, an annoying, waxy substance that gummed up their drilling equipment. Chesebrough called it Vaseline, and he used it to treat cuts and burns. He even ate a spoonful of the stuff every day.

9. Next up is the pacemaker, invented by Wilson Greatbatch, who was working on an oscillator to record heart sounds in the late 1950s. When he accidentally installed the wrong resistor, the device started giving off a rhythmic electrical pulse, and Greatbatch realized it could be used to regulate a human heart, and that's handy since pacemakers at the time were the size of a television set.

10. In 1827, English pharmacist John Walker was stirring a pot of chemicals that included antimony sulfide and potassium chlorate, and then he noticed this dried lump at the end of his mixing stick. Now, he tried to scratch it off, but it burst into flames and the world had it's first prototype of the strikeable match.

11. Despite what you may have heard, NASA did not invent Velcro. In 1941, a Swiss electrical engineer named George de Mestral noticed how easily cockle burs attached to his dog's fur. Now, he modeled the Velcro after the tiny hooks in the bur that so easily catch onto clothing and fur.

12. DuPont chemist Roy Plunkett was at work on a new chlorofluorocarbon refrigerant in 1938 when he changed the lives of cooks everywhere. Testing different chemical reactions, he accidentally discovered a new polymer called polytetrafluoroethylene, but you know it better as Teflon.

13. Ninth century Chinese alchemists made an explosive discovery in their quest to find an elixir for eternal life. They found out the hard way that mixing salt peter, sulfur, and charcoal is not a recipe for immortality; it makes gunpowder.

14. And in keeping with this theme, Alfred Nobel's invention of dynamite was partially inspired by an accident while transporting nitroglycerin. A can broke open and leaked, but the liquid was absorbed by a rock mixture called kieselguhr--sounds like it could be a chair at IKEA.

15. Now, I don't know if everything that explodes was discovered by accident, but it's sure starting to sound like it. You know, Enrico Fermi made an explosive discovery in the 1930s, although he didn't even realize it at first. He was trying to make super heavy atoms by bombarding uranium with neutrons. Now, he was successful at creating elements 93 and 94, but was at a loss to identify some of the other products that he produced. It was only later that scientists realized these daughter elements were not heavier than uranium, but actually had about half the mass. Fermi had unwittingly split the nucleus in half, discovering nuclear fission.

16. In 1856, a teenage Chemistry student named William Perkins was attempting to create an artificial quinine to treat malaria. Now it was unsuccessful, but over the course of his experimenting with tree bark and coal tar, he discovered a new color in the residue and it was called Mauve. Perkins isolated the color and would go on to create the world's first synthetic dye. By the way, if you're counting at home, that's the third time coal tar has featured prominently in an accidental invention.

17. It's nice to know, that if you're ever in a car accident, your windshield probably isn't going to shatter into a million lethal pieces. This is due to Safety Glass, accidentally discovered by French chemist Edouard Benedictus in the early 20th century. He dropped a glass flask, coated with plastic cellulose nitrate and it didn't shatter.

18. While experimenting with cereal recipes in 1895, Will Kieth Kellog forgot about some boiled wheat he left sitting out. The wheat became flaky, but Kellog and his brother cooked it anyway. The resulting crunchy and flaky material became a cereal you may have heard of, called Corn Flakes.

19. Now, in keeping with the food theme, Proctor & Gamble scientists, working on a nutritional supplement for premature infants in the 1960s, instead discovered Olestra, a fat substitute with zero calories. Three decades later, it showed up in grocery stores with some unfortunate side effects. But thankfully, we now have the handy phrase "anal leakage."

20. Kodak engineer Harry Coover was working with chemicals known as cyanoacrylates during World War II in an attempt to make clear plastic for gun sights, when his team instead discovered what today is known as super glue.

21. Speaking of sticky stuff, in 1968 while Dr. Spencer Silver was trying to develop a strong adhesive, he accidentally ended up creating a weak, repositionable adhesive instead. Now, he wasn't quite sure what to do with this discovery until 1974 when a fellow 3M scientist desired a lightly adhesive bookmark for his hymnal. That became the post-it note.

22. There is dispute over who actually invented anesthesia, but there is little argument that it's origins were accidental thanks to the popular recreational use of ether and nitrous oxide during the early 1800s. Gatherings were referred to as "ether frolics" and "laughing parties." But luckily someone--Horace Wells and Charles Jackson are commonly cited--realized both substances inhibited pain in people who used them.

23. In 1943, naval engineer Richard James was working with tension springs to create a meter for the horsepower of naval vessels. When he accidentally knocked one of these springs over, he noticed that it kept moving after it hit the ground. And the idea for a new toy was born--the Slinky. But I doubt he would have guessed how a stretched slinky would fall.

24. How about we end with the most famous accidental discovery of all time, one that also now comes in pill form? Sir Alexander Fleming was experimenting with the influenza virus in 1928 when he left for a two-week vacation. He returned to find that a mold had contaminated his staphylococcus cultures. But more importantly, he found that the bacteria was unable to grow anywhere near the mold, and that moment of sloppiness, which resulted in the invention of penicillin, would change medicine forever.

Thank you for watching Mental Floss on Youtube. It was created with the help of these fine people and, of course, myself, Derek from Veritasium. If you want to check out my channel, click on this link.

BKNcart asks, "Why do onions make us cry when we cut them?"

Well, BKNcart, I'm glad you asked. It's because the onion releases a compound called syn-Propanethial-S-oxide, which gets into your eyes, interacts with the water, and creates sulfuric acid. So, your eyes are actually watering to get rid of that acid.

If you have a mind-blowing question, please leave it in the comments and if you're lucky, you may see it answered here at the end of a Mental Floss video. I'm Derek Muller, and thank you for watching.