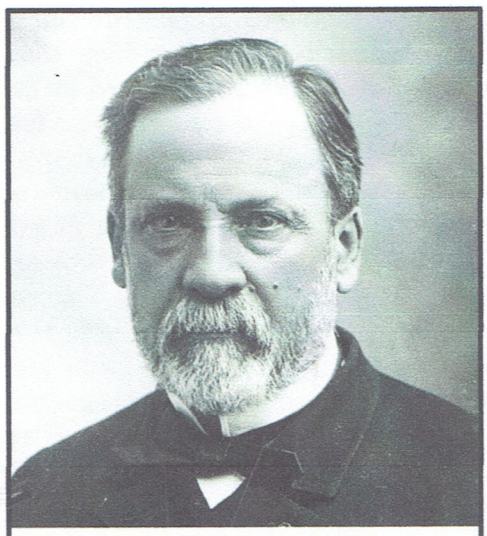
LOUIS PASTEUR

(1) If my name sounds familiar, it's probably because you know about the process of pasteurization, which is named after me. Pasteurization is the process of killing microorganisms using low heat. I developed this technique which has become widely used to ensure the safety of various foods, most notably, milk products. In my day, scientists had no idea that microorganisms were responsible for many diseases. It wasn't until I came up with my "germ theory" of disease that doctors understood that certain microbes could make people sick. For this, I am considered the father of microbiology.



Louis Pasteur
Microbiologist, Chemist (1822-1895)

(2) I was born into a poor family on December 27th, 1822 in Dole, France. I never showed any promise in school and I'm sure my teachers didn't think I would make much of myself because I preferred sketching and fishing over studying all day. I really enjoyed drawing portraits of my friends and family. When I was sent to Paris to continue my studies, I became homesick and returned home. I managed to earn a degree in 1840 from the Collège Royal de Besançon. I continued my studies at the Besançon, but failed my first exams in 1841. Though I earned another degree in science in 1842, I got poor marks in Chemistry. After this I tried to gain entrance to the *École Normale Supérieure* but I failed the entrance exam. Though I wasn't great at getting good grades or passing exams, I was interested in science. This interest motivated me to continue my scientific education. I tried again in 1844 and this time I passed and started my studies. A year later I received my Bachelor of Science.

(3) Ironically, I became a professor of chemistry in 1848 at the University of Strasbourg at the age of 26. I think my students would have been shocked to know I had done so poorly in chemistry when I was their age. This is where I met my wife, Marie, and we were married a year later. We had five children but three of them died young from typhoid. Their loss left a lasting impression on me, so much so that later on in life, it made me want to find cures for the multitude of horrible infectious diseases that plagued humanity.

(4) In 1857, I became the director of the *École Normale Supérieure.* For the next 9 years, I governed the school strictly. I wanted to improve the achievements and expectations of the school and I'll admit that I was very inflexible in my thinking, some would even say that I was arrogant. I had high standards and great discipline and expected the same from students. My authoritarian leadership led to two student revolts. At one point, the school was only left with 7 students after 73 of the 80 students resigned when I threatened to expel any students that were caught smoking. I was not well liked and my contributions to science were not destined to lie in educating others.

(5) My scientific research is what has led to my greatest achievements. At the time, it was generally accepted that bacteria and other microorganisms existed, but that they formed spontaneously out of nothing. This popular idea was called spontaneous generation. I disagreed with this and felt that any existing or new microbes could only form from pre-existing microbes. I conducted several fermentation experiments using bacteria to make wine and yeast to make beer. My experiments were very effective in disproving the idea of spontaneous generation. I also demonstrated that microorganisms could also cause food to spoil and go bad. I decided to invent a process to kill these microorganisms and thus pasteurization was born. If liquids, like milk, were heated between 60-90 °C (but not hot enough to boil) this killed most of the microorganisms in the milk that would cause spoilage without greatly changing the flavor or texture of the milk. I also discovered that chilling foods would slow down microbial growth.

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(6) The discovery that microorganisms could make food go bad led me to the idea that perhaps they could also cause harm to living things. I wondered if they were responsible for causing diseases in humans and other animals. I researched cholera in chickens as well as anthrax because it was greatly affecting sheep and human populations at the time. I became more convinced of my idea of the "germ theory" of disease and I began to promote the idea to doctors. I wanted them to be aware that microorganisms could enter human bodies and make patients sick and that these germs were contagious. Up until that point, very few doctors washed their hands when examining patients or even before performing surgery, nor did they make a habit of cleaning their medical instruments because they had no idea about germs. Germs were invisible after all.

(7) My work on germs also guided me towards the study of immunization and vaccination, which had been first investigated by Edward Jenner. I developed the first vaccines, most notably, the vaccine against rabies, but this discovery was controversial as I tested my experimental vaccine on a young boy who had been bitten by a dog with rabies. I did this experiment to prove the effectiveness of my vaccine. The boy lived, but this type of experiment would be considered too dangerous and unethical to conduct today.

(8) For someone who didn't do well in science at school, my contributions to science has saved countless lives. Think about that the next time you're in a hospital and you see a nurse put on a pair of latex gloves and a face mask.