

LOUIS PASTEUR

December 27, 1822 - September 28, 1895



Louis Pasteur was a famous chemist and biologist. He proved that germs cause many diseases. He invented ways to kill harmful germs in milk and other products. Pasteur also developed a vaccine to prevent rabies. His work greatly helped to control disease in both people and animals.

Louis was born in eastern France, on December 27, 1822. His father was a tanner. After Louis completed his studies in Paris in 1847, he taught chemistry and physics. He married Marie Laurent in 1849. They had five children. Three of the children died of typhoid fever. Some people have said that these tragic losses led Pasteur to study the causes of disease.

The Germ Theory

Pasteur performed many experiments to understand why beer and wine sometimes soured. He found that *microbes*, or germs, from the outside caused spoiling. This led him to believe that the same process caused many diseases.

According to the germ theory, infectious diseases are the result of germs from the outside attacking the body. Pasteur's discoveries inspired another scientist, Joseph Lister, to find safer ways for doctors and hospital staffs to safely perform surgery and treat patients. Before this time, people paid very little attention to preventing the spread of germs from one person to another. Now the medical profession began to pay close attention to cleanliness to avoid spreading disease.

Spontaneous Generation

Before Pasteur's experiments, many people believed that some living things simply appeared out of nowhere. They believed that maggots came from meat and that frogs came from water. Pasteur did not accept this idea of "spontaneous generation." He believed that organisms come from other organisms; that germs come from other germs.

In order to prove his idea, Pasteur filled two separate flasks with chicken broth. He boiled both containers to kill all the bacteria. The contents of one flask were protected from germs floating in the air. The contents of the other flask were not. The protected flask developed no form of life in it. It did not spoil. The contents of the other flask developed bacteria. Pasteur concluded from this that the organisms in this flask arose from contamination from the outside, not from "spontaneous generation."

Pasteurization

During Pasteur's time, the souring of beer and wine caused major losses of money for producers in France. Pasteur and others found that heating the starting sugar solutions to high temperatures eliminated enough of the bacteria to prevent spoilage. He then applied the idea to other products such as milk, cheese, and other food products.

The products are sufficiently heated under pressure to kill harmful bacteria and reduce spoilage. Bearing the name of the inventor, the process of "pasteurization" is widely used throughout the world today.

Rabies Vaccine

Pasteur spent a lot of time studying the cause of many diseases. He developed vaccines to prevent them where possible. Although he worked on cholera, diphtheria, tuberculosis, and smallpox, he is perhaps best known for his work on rabies. Rabies was a dreaded disease with horrible symptoms. People get rabies from being bitten by an infected animal, especially dogs and wolves. A person who develops the disease usually dies.

Pasteur had already learned about vaccines. Giving a weakened strain of certain disease-causing germs to a person keeps that person from getting the disease. Pasteur was working on a rabies vaccine in July 1886 when a nine-year-old boy, Joseph Meister, came to his laboratory. The boy had been badly bitten by a rabid dog. Pasteur had already successfully tested his new vaccine on dogs, but never on people. He was not yet sure that his vaccine would be effective. With no treatment, however, Joseph Meister would almost certainly die.

Pasteur went ahead with the treatment and Joseph Meister made a complete recovery. Pasteur repeated the process on another victim shortly afterward. Word of his success spread quickly. Other victims of dog bites came to Pasteur from around the world for treatment. The Pasteur Institute opened in Paris to treat these victims. It is still working today on the problems of human disease.

Other Discoveries

Pasteur made many discoveries that improved the health of human beings. He also contributed greatly to agriculture by reducing animal disease. He saved the French silk industry from catastrophic damage by a silkworm disease, and produced a vaccine for anthrax and chicken cholera. These discoveries protected animal raisers from serious financial losses.

When Louis Pasteur died on September 28, 1895, he had already become a French national hero. He was buried in Paris, first at Notre Dame Cathedral and later in a crypt below the Pasteur Institute in Paris.



Name _____ Date _____

Answer the questions about *Louis Pasteur*

1. List three of Louis Pasteur's discoveries from which the world still benefits today.

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- _____
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2. How did Joseph Lister apply Pasteur's findings?

3. Where is Pasteur buried?

4. When did Pasteur test the rabies vaccine on a human?

5. What subjects did Pasteur teach when he was a professor?

6. Who is Joseph Meister?

7. Which procedure invented by Pasteur is still used today to process milk and certain other food products?

8. What idea did Pasteur put an end to when he proved that organisms come from other organisms?

9. Which of Pasteur's theories led to new standards of hygiene in hospitals?

Answers to the questions about *Louis Pasteur*

1. The germ theory, disproving the idea of spontaneous generation, pasteurization, rabies vaccine
2. Pasteur's discoveries inspired another researcher, Joseph Lister, to put in place better sanitary practices in hospitals.
3. Pasteur is buried in a crypt under the Pasteur Institute in Paris.
4. July, 1886
5. physics and chemistry
6. Joseph Meister was the boy Pasteur tested the rabies vaccine on.
7. pasteurization
8. spontaneous generation
9. the germ theory