Scientist – Theory - Discovery

عالم – نظرية علميه – إكتشاف علمي

Louis Pasteur	لويس باستير
Germ Theory	نظرية الجراثيم

THE GERM THEORY

Human diseases were not truly explainable until scientists grasped the importance of microorganisms. The Dutch microscopist Antoni van Leeuwenhoek, who discovered what he called animalcules, did not realize how close he had come to identifying bacteria and formulating a germ theory of disease.

For centuries the prevailing belief, along with the humoral theory, was that noxious bad air—miasma or vapors—was the causative factor. Astral influences were also cited, along with chemicals, poor nutrition, various other outside influences, and even permutations of the laws of physics.

The revolutionary theory that microscopic infectious agents could cause disease was not the brainchild of a single scientist. Rather, the germ theory evolved gradually through the thinking of several investigators, dating back to the 1500s, scientists who suspected that some unidentified entity was behind certain forms of illness. But credit for the germ theory should be granted to three men in the later 19th century: Louis Pasteur, Joseph Lister, and Robert Koch.

In experiments with fermentation, Pasteur showed that putrefaction in milk and wines was not the result of spontaneous decay (a popular belief) but microorganisms in the air, which contaminated liquids exposed to them. Heating milk to a certain temperature, he also found, would prevent it from spreading tuberculosis and typhoid, proof that the organisms' effects could be stifled.

Lister's contribution to the theory was the use of an antiseptic to kill germs, notably in surgical situations. While Pasteur had demonstrated the involvement of microbes in putrefaction, his own sterilization techniques were not suited for the operating suite. Lister, a surgeon, was on the other hand most scrupulous in his work habits, draining wounds, frequently changing dressings, and using silver sutures to keep wounds clean.

French scientist Louis Pasteur proved microorganisms key to both wine and disease.

Aware that Pasteur's heat sterilizations did little for surgery, Lister turned to chemical antiseptics such as carbolic acid. He demonstrated that infections were caused by bacteria and could be controlled by antibacterials—and thus inspired a great advance in surgical medicine.

It was Robert Koch, however, who devised new ways of obtaining pure cultures of microorganisms in specially prepared, nutrient-rich media. Keenly aware of contamination at a time when surgeons were ignoring Lister—and when they still performed operations in street clothes without masks or caps—Koch demanded sterile laboratory conditions.

For cultures, he came up with the right combinations of gels and agar—the gelatinous material derived from marine algae and used as a medium for culturing bacteria—instead of Pasteur's bouillon. Koch's methodology paid off, and he isolated not only the anthrax bacillus but also the bacterium responsible for pneumonia. His researchers went on to identify the causative agents in typhoid and diphtheria, while he turned his attention to malaria. He was awarded the Nobel Prize in physiology or medicine in 1905, honored as one of the fathers of bacteriology and the germ theory.

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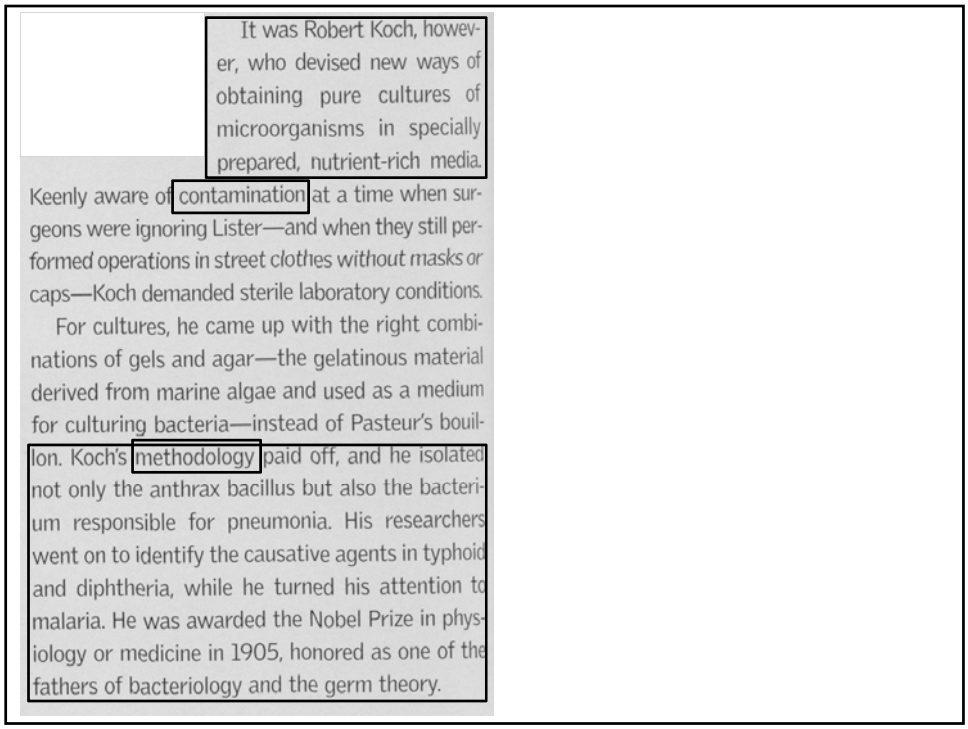

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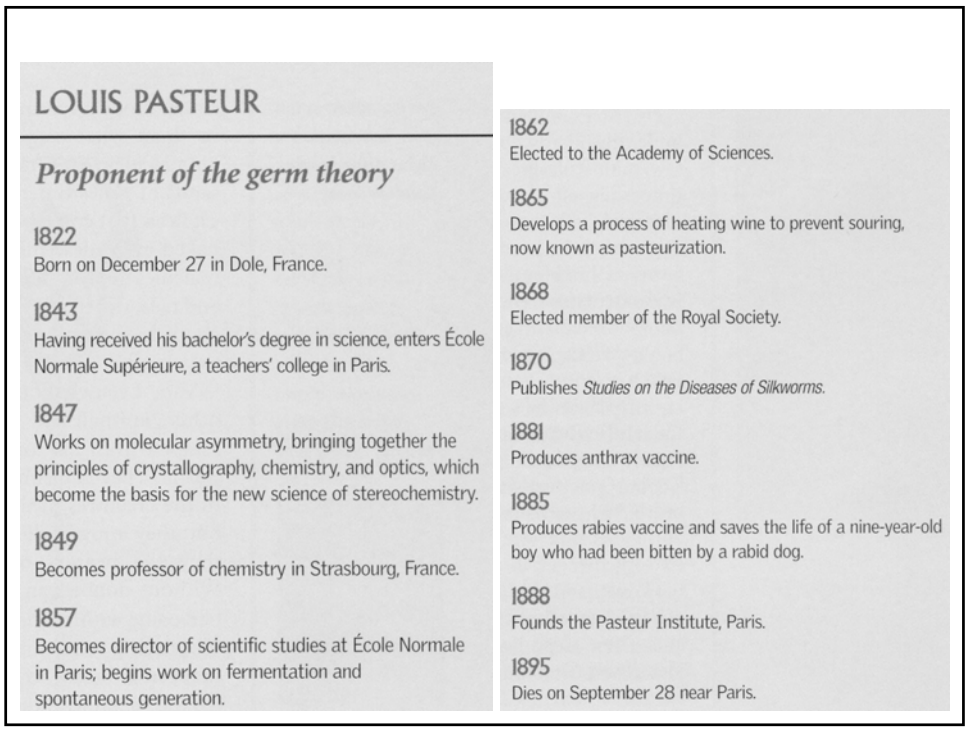

LOUIS PASTEUR

Proponent of the germ theory

1822
Born on December 27 in Dole, France.

1843
Having received his bachelor's degree in science, enters École Normale Supérieure, a teachers' college in Paris.

1847
Works on molecular asymmetry, bringing together the principles of crystallography, chemistry, and optics, which become the basis for the new science of stereochemistry.

1849
Becomes professor of chemistry in Strasbourg, France.

1857
Becomes director of scientific studies at École Normale in Paris; begins work on fermentation and spontaneous generation.

1862
Elected to the Academy of Sciences.

1865
Develops a process of heating wine to prevent souring, now known as pasteurization.

1868
Elected member of the Royal Society.

1870
Publishes *Studies on the Diseases of Silkworms.*

1881
Produces anthrax vaccine.

1885
Produces rabies vaccine and saves the life of a nine-year-old boy who had been bitten by a rabid dog.

1888
Founds the Pasteur Institute, Paris.

1895
Dies on September 28 near Paris.