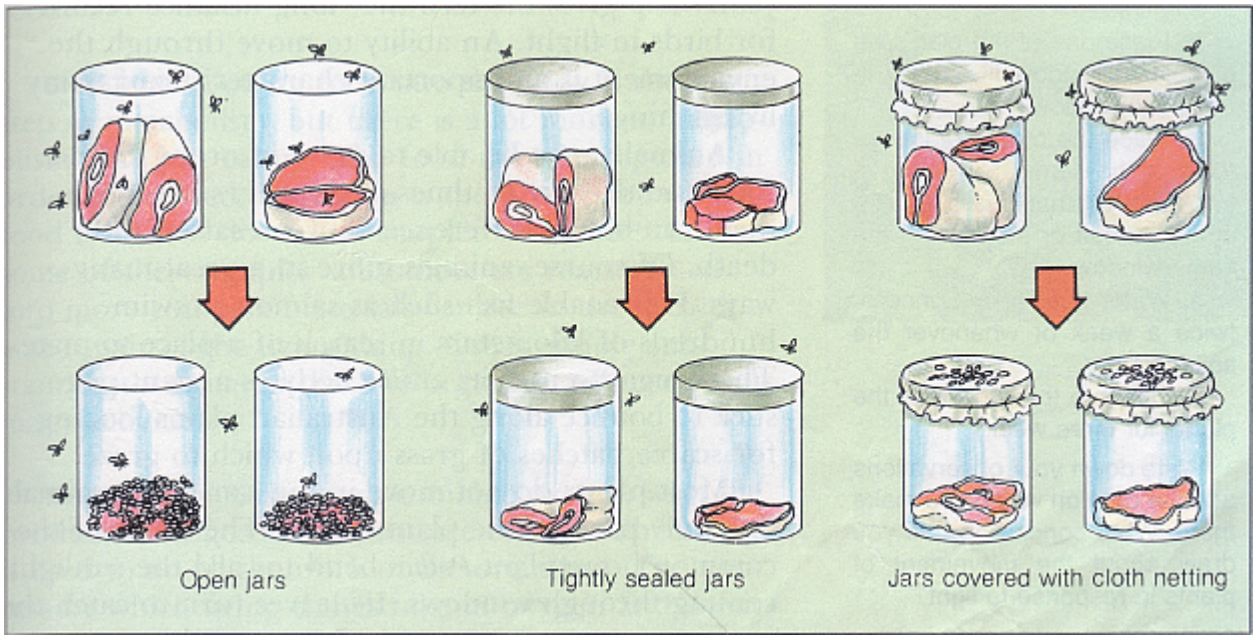
Spontaneous Generation

Man was always interested as to where life came from. Since the time of Aristotle (4th century BC) it was commonly believed that ***nonliving objects gave rise to living things***, otherwise known as **SPONTANEOUS GENERATION**.

Consider the following observation and conclusion:

> **Observation:** Since there were no refrigerators, the mandatory, daily trip to the butcher shop, especially in summer, meant battling the flies around the carcasses. Typically, carcasses were "hung by their heels," and customers selected which chunk the butcher would carve off for them.
> **Conclusion:** Obviously, the rotting meat that had been hanging in the sun all day was the source of the flies.

In 1668, Francesco Redi, an Italian physician, devised the first experiment to disprove the belief in spontaneous generation.



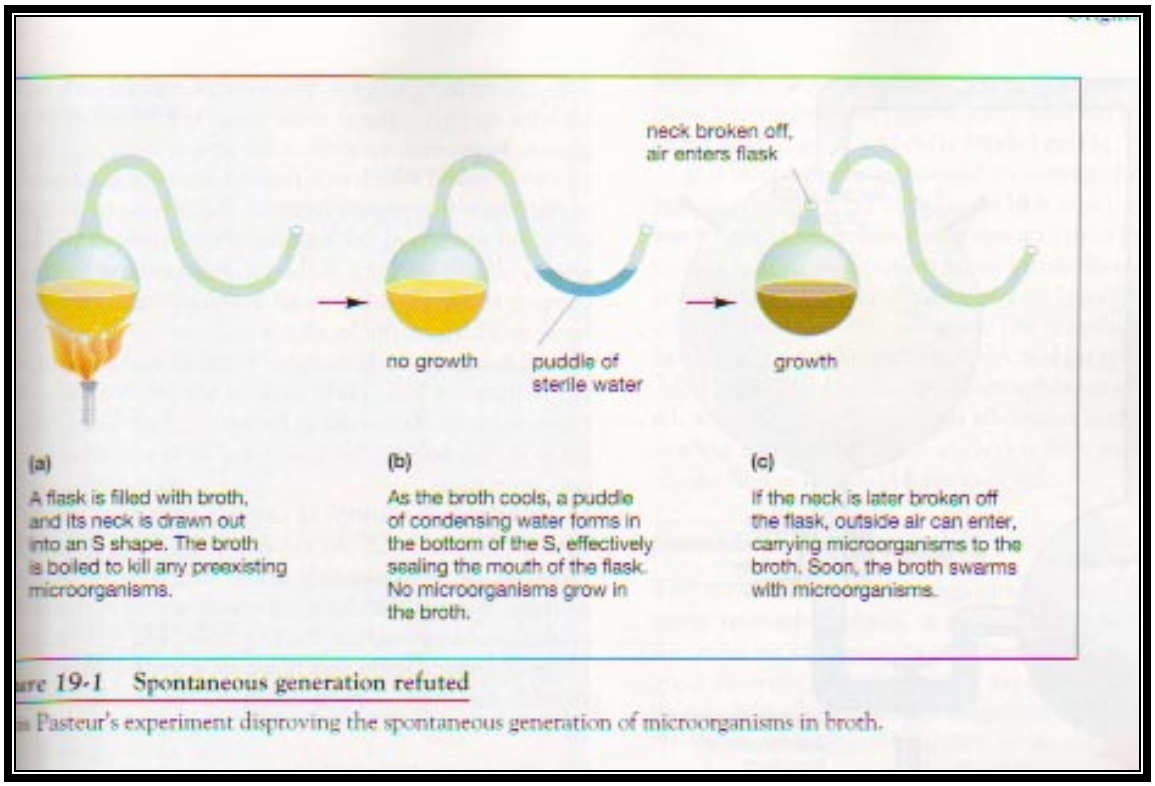
1	**2**	**3**
Meat in uncovered jars	meat in tightly closed jars	meat in jars covered with cloth

1. Identify the control and experimental groups in this experiment.

2. Identify the independent and dependent variables.

3. Did the results of this experiment support spontaneous generation? Why or why not?

Although Redi and other scientists performed various experiments disproving spontaneous generation, it was not until 1864 that Louis Pasteur finally dispelled this notion with his experiment as illustrated below.



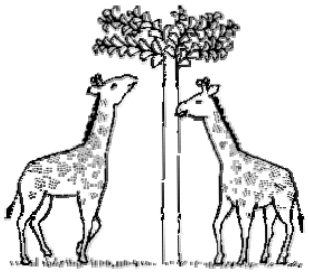
ure 19-1 Spontaneous generation refuted

Pasteur's experiment disproving the spontaneous generation of microorganisms in broth.

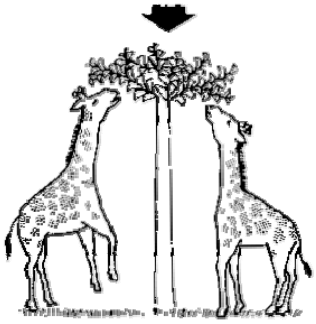
Jean Lamarck

In the early 1800s, Jean Lamarck was one of the first scientists to offer a theory about evolution. Although his ideas were eventually discredited due to a lack of evidence, he was one of the first people to offer a scientific explanation for his observations about life.

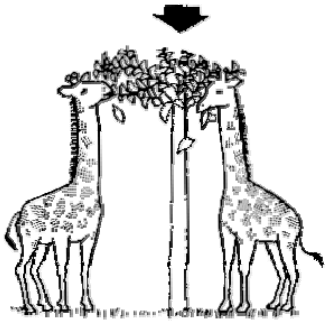
a. **use and disuse:** Organisms developed new structures based on need. He also believed the size of an organ is determined by how much it is used.



The ancestors of giraffes had a short neck, but they had the habit of eating leaves up on the trees



As they reached for high leaves their necks became longer.



The character of longer neck was passed on to their descendants, making a long-necked giraffe

Figures from Ueda and Suzuki, 1974, 369.
Explanatory text from Suzuki and Mori, 1987, 466

b. **inheritance of acquired characteristics:** useful characteristics that were acquired during that organism's lifetime would be passed on to future generations. In other words, if a giraffe developed a long neck during its lifetime as a result of feeding from tall trees, the giraffe would –pass this trait to its offspring.

1. If Larmarck's theory was true, then dancers have big, strong leg muscles because they used them all the time. Dancers would pass this trait of strong leg muscles to their children. Do you agree with this statement? Explain your answer.

Disproving Larmarck's Theories

In the late 1800s, August Weisman examined the idea that acquired characteristics were inherited by using mice in an experiment where he cut off their tails and let them mate.

X

1. Would you expect the tails of the first generation offspring to be:
   - Approximately the same length as those of the parents' original tails
   - A little shorter than the parents' original tails
   - Much shorter than the parents' original tails
   - Almost as short as the parents' tails after they have been cut

   Pick one of the above choices and explain your answer.

2. Weissman continued to cut the tails off of each generation of mice for 60 generations. Predict what you think the 61st generation of mice would look like?