**Early Discoveries**

Around the same time that Leeuwenhoek was making his discoveries in Holland, the English scientist Robert Hooke was experimenting with the microscopes he built himself. Hooke looked through his microscope at a thin piece of cork that he had cut from the bark of an oak tree. He saw tiny boxlike compartments that reminded him of a honeycomb. He called this little boxes “cellulae” which means “little rooms” in Latin. Hooke’s observation gave us the present-day word “cell.”

Scientists soon observed cells in every living thing they looked at with microscopes. In 1839, Matthias Schleiden and Theodore Schwann combined their observations and made the hypothesis that all organisms are composed of cells. A cell is the basic unit of life, they suggested, because all the functions carried out by living things are carried out by their individual cells as well.

**Spontaneous Generation**

In past centuries, it was commonly believed that some living organisms, such as maggots, flies, or even mice, could be produced from non-living matter such as air or water. This idea is called spontaneous generation. Spontaneous generation was used to explain such observations as maggots appearing suddenly in decaying carcasses. People believed that maggots appeared out of nowhere, as if by magic. In the late 17th century, Francesco Redi proved that the theory of spontaneous generation was false. He placed rotting meat in 4 jars. He used 4 jars to ensure he had accurate results. He left 2 of the jars uncovered, and covered the other 2, so that no insects could get in. Over time the uncovered jars were filled with maggots and flies, however, the covered jars were free of maggots and flies. He demonstrated to people that the maggots and flies did not appear magically, but that they came from tiny eggs laid on the meat by the flies. When the flies could no longer get to the meat, they could not lay their eggs.

However, many people still believed in spontaneous generation until the mid-19th century. They claimed that the air itself contained an “active principle” that could give life to micro-organisms. Louis Pasteur created an experiment that finally caused people to abandon the old theories of spontaneous generation. Pasteur’s experiment showed that micro-organisms come from other micro-organisms in the air and water. They do not appear from spontaneous generation.

The idea that life can only be produced by life had been suggested by a German scientist named Rudolf Virchow. The general statements of Virchow, combined with the ideas of Schleiden and Schwann, form a set of hypotheses called the cell theory.

**CELL THEORY**

1. All living things are composed of one or more cells.

2. Cells are the basic units of structure and function in all organisms.

3. All cells come from previously existing cells.

4. The activity of an entire organism depends on the total activity of its independent cells.