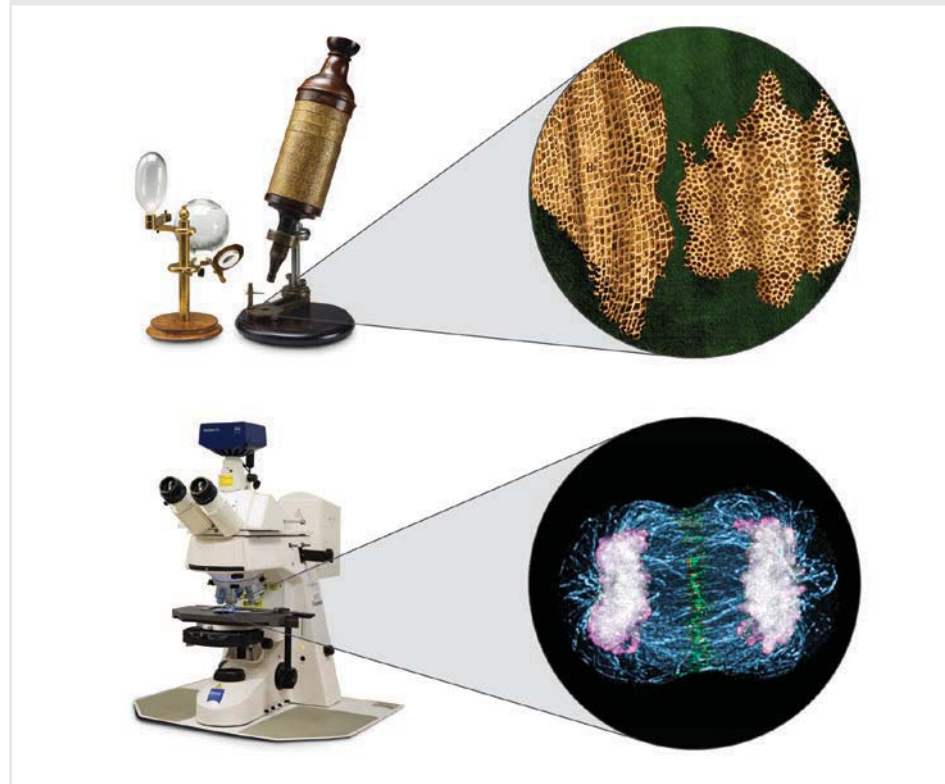


A Brief History of Cell Theory

In order to learn more about cells and how they function, scientists first depended on simple instruments. Over time, advancements in science and technology resulted in microscopes that allowed us to not only see cells, but to observe processes occurring within them.

Before the 1600s, people had no idea that cells existed, and so had other explanations for the basis of life. That all began to change after the English scientist Robert Hooke first viewed cork under a microscope. He observed that cork is made of tiny, hollow compartments. The compartments reminded Hooke of small rooms found in a monastery, so he gave them the same name: cells. However, it took nearly 200 years before scientists made the connection between biological cells and life.

FIGURE 8: The cells viewed under Hooke's microscope are from cork, dead plant tissue. The cell viewed under the modern microscope is in the process of dividing.



Predict Advances in which fields most likely influenced changes in microscope technology?

Cell Theory

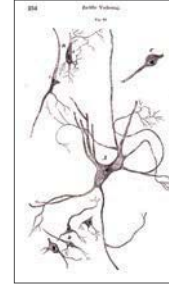
Almost all cells are too small to see without a microscope. Magnifying lenses had already been around for hundreds of years before Robert Hooke developed his microscope, but their quality was limited by the lens-grinding technology of the times. Therefore, even though Robert Hooke had designed a state-of-the-art microscope for his time, he would most likely not have seen anything inside the cork cells when he studied them, even if they had been alive. So how did scientists come to learn so much about cells, and how long did it take?

FIGURE 9: A timeline of the study of cells

1595 Zacharias Janssen
Dutch eyeglass maker who invented the compound microscope by placing two lenses in a tube.



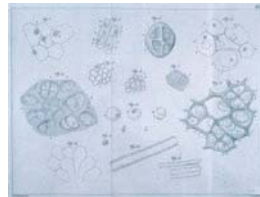
1674 Antonie van Leeuwenhoek
Dutch tradesman who developed a more powerful microscope. He observed numerous single-celled organisms swimming in a drop of pond water, which he called "animalcules."



1855 Rudolf Virchow
German scientist who stated that all cells come from other cells. He also described the microscopic structure of cells such as nerve cells.

1665 Robert Hooke
English scientist who used a three-lens compound microscope to examine thin slices of cork from an oak tree (Figure 8). He called the tiny, hollow compartments he saw "cells."

1838 Matthias Schleiden
German botanist who used compound microscopes to study plant tissue and proposed that plants are made of cells.



1839 Theodor Schwann
German animal physiologist who noticed structural similarities between plant cells and the animal cells he had been studying. He concluded that all living things are made of cells and cell products.



Analyze Using the development of cell theory as an example, make a claim for how science influences technology and technology influences science.

The **cell theory** is one of the first unifying concepts developed in biology. Theodor Schwann, influenced by the work of Matthias Schleiden and other scientists, published the first statement of the cell theory. Schwann's theory helped lay the groundwork for all biological research that followed. However, Schwann stated in his publication that cells form spontaneously by free-cell formation. As later scientists studied the process of cell division, they realized that this part of Schwann's idea was wrong. The cell theory is an example of a theory that changed over time as new discoveries were made.

The major principles of the cell theory are:

- All organisms are made of cells.
- All existing cells are produced by other living cells.
- The cell is the most basic unit of life.



Explain Before the cell theory was developed, many people claimed that spontaneous generation was possible. In other words, that cells arose from nonliving matter, such as dust or rotting meat. Respond to that claim using the principles of cell theory.