



## The Cell Theory - Early Cell Explorers Timeline

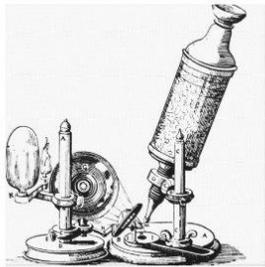
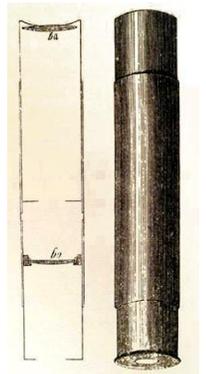
### (7.3.1, 7.3.4, 7.3.5)

Most cells are too small to be seen without a microscope. There was even a point in time where people didn't know anything about cell structure! Read the following paragraphs to better understand how much microscopes have changed, as well as our understanding of cells.

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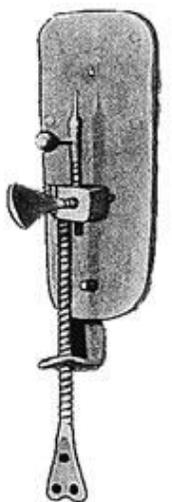
#### Early Microscopes

In **1590**, Hans and Zacharias Janssen, Dutch makers of reading glasses, created the first microscope. They put two magnifying glasses together in a tube. The image observed appeared larger than the image made by each lens on its own.



Seventy-five years later, in **1665**, Robert Hooke used a microscope to view a thin slice of cork. To him, the corked looked like it was made of empty boxes or spaces. He named these spaces "cells." The word cell came from the Latin word for chamber, *cello*.

In **1673**, just a few years later, Anton van Leeuwenhoek (AN•tahn VAN LAY•vuhn•huk) made a simple (yet compound at the time) microscope with a tiny glass bead for a lens. This microscope magnified objects 270 times their original size. He observed a drop of pond water only to see living organisms nobody had ever seen before. He was the first person to describe actual living cells! Van Leeuwenhoek had discovered single celled protozoa and called them "animalcules" and "cavorting wee beasties."



## Cell Theory

Now that cells could be observed with microscopes, other scientists started to wonder if other living things were made of cells.

Skip ahead over 150 years to **1838**. Matthias Schleiden (muh•THY•uhs SHLY•duhn) was a German botanist. A botanist is someone who studies plants and Schleiden used a microscope to study plants. He concluded all plants are made of cells. Then, in 1839, Theodor Schwann (THEE•oh SHVAHN) determined that all animal tissues are made of cells. Schwann was a German physiologist, studying the functions in living systems. Both of these conclusions are often combined, explaining that all organisms (plant and animal) are made of one or more cells.

- Organisms that are made up of only one cell are called *unicellular organisms*. The single cell of a unicellular organism must carry out all of the function for life.
- Organisms that are made up of more than one cells are called *multicellular organisms*. Multicellular organisms have cells with specialized functions.

Finally, in **1858**, a German doctor named Rudolf Virchow (ROO•dawlf VIR•koh) observed cells dividing. He proposed that cells could form only from the division of other cells. Every cell had to come from a cell that already existed.

By combining the work, observations and conclusions of these scientists, we now have what is called the **cell theory**. It has three basic parts:

- All organisms are made up of one or more cells.
- The cell is the basic unit of organization in all organisms.
- All cells come from existing cells.