

Cell Theory

OR, WHAT FEUDING SCIENTISTS FINALLY
AGREED ON!



5 simple rules...



- Of the 6 characteristics of living things, the 1st 5 are pretty easy to observe.
- Can you tell if an object grows & develops, responds to its environment, reproduces, uses energy, and is organized without much trouble?
- Which objects on your homework had these 5 qualities?

The Crucial 6th Characteristic



But, how do we know that organisms are made of cells?

- The answer is Cell Theory which has a surprisingly interesting history.

Start Taking Notes

It Started With A Microscope!



- Most cells are much too small to see with the naked eye. This is why the invention of the microscope was critical in helping scientist understand cells.
- In the 1590s (Perhaps about 1595), brothers Hans and Zacharias Janssen developed the first compound microscope. It had a lens on each end of a long, narrow tube which allowed for magnified views of tiny objects.



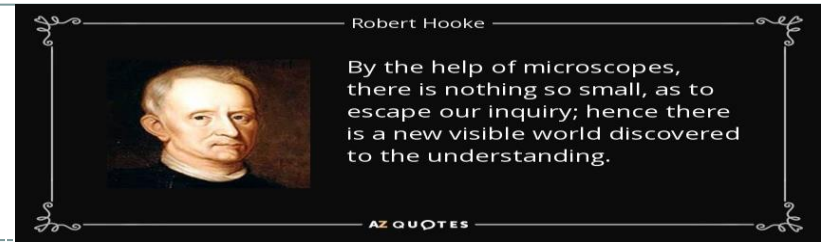
From tooth gunk to cells!



- The microscope was very popular amongst natural scientists of the day and many used it to get closer looks at everyday objects like plant leaves, vegetables, and even the gunk between their teeth! Many were fascinated by what they saw.

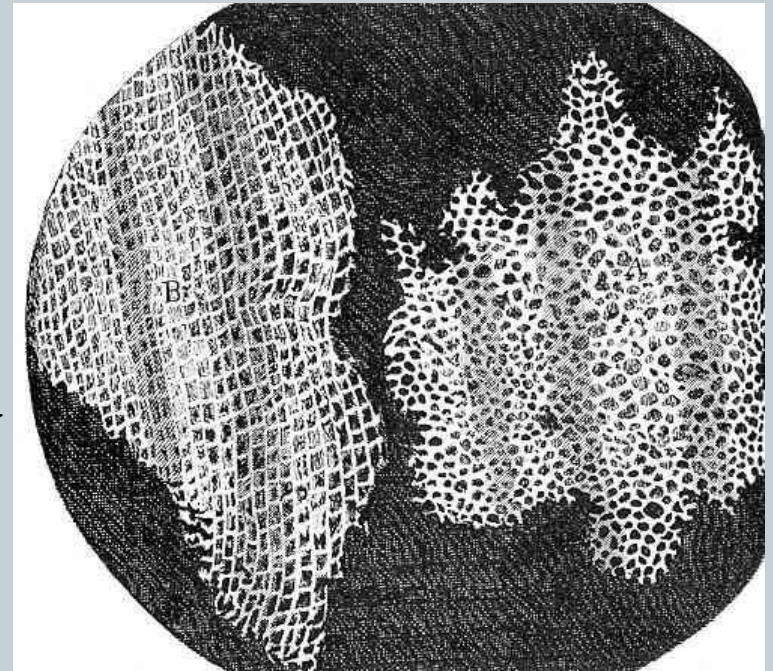


Robert Hooke and Cork



- In 1665, scientist Robert Hooke took a look at a piece of cork underneath a microscope and noticed that, up close, it looked like it was made of empty “cells” like the ones monks slept in at monasteries (or prisoners in jail).
- He was the first person to use the word “cells” in the scientific sense.

*The reason the cells looked empty is because cork is dead tree bark.



Hooke's drawing of cork “cells”

Anton van Leeuwenhoek



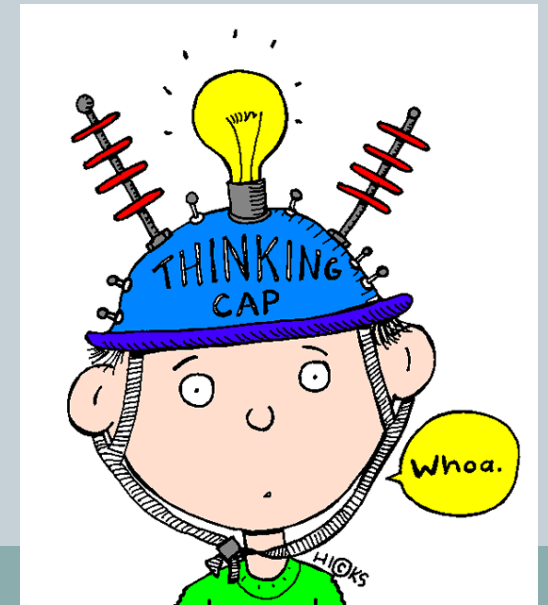
- 8 Years later, van Leeuwenhoek (Lee-ven-hook) improved the microscope by using polished lenses that increased the magnification power.
- He was the first to see living cells and “discovered” bacteria.

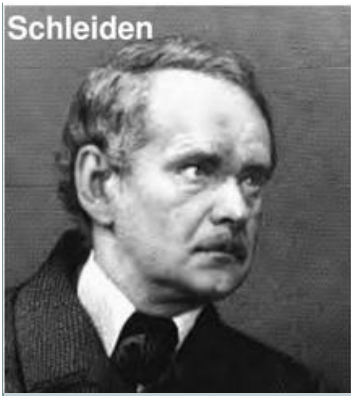


New Ideas



- Using info from Hooke and van Leeuwenhoek, other scientists were interested to study cells even further and began to develop the cell theory which we still use today.
- The theory has three parts and each was proposed by a different scientist.





Matthias Schleiden



- Schleiden, a botanist, studied hundreds of plants under his microscope and, in 1838, realized that each and every one was made of the cells Hooke and van Leeuwenhoek described.
- He proposed that ALL PLANTS are made of cells.

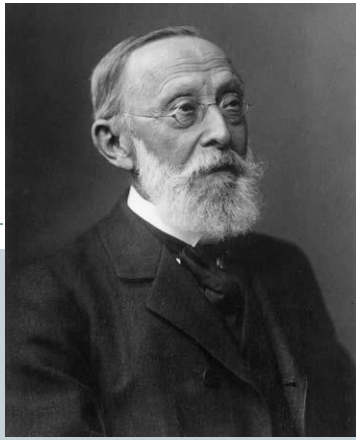




Theodor Schwann



- The very next year, in 1839, Theodor Schwann realized that the nucleus of Schleiden's plant cells was very similar to what he noticed in animal cells under his microscope.
- He proposed that ALL ANIMAL are made of cells too. He also stated that **CELLS ARE THE BASIC UNIT OF ALL LIVING THINGS.**

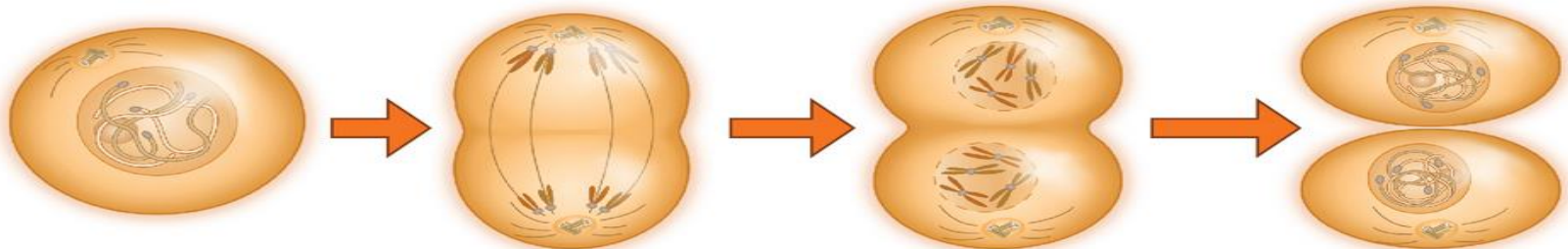


Rudolf Virchow



- In 1855, Rudolf Virchow published a book stating his belief that **ALL CELLS COME FROM OTHER LIVING CELLS**.
- This was very controversial because many believed this was not his idea and that he plagiarized by stealing the work of another, less famous scientist.

Cell division



A 3-Part Theory



- Schleiden, Schwann, and Virchow's ideas were combined into the **CELL THEORY**:
 1. Every living thing is made of one or more cells.
 2. Cells carry out all of the basic functions needed to support life.
 3. Cells only come from other living cells.



**In science, a theory is an accepted explanation for something that has been repeatedly tested and confirmed. This theory reminds us of facts about cells.*