**Cell Theory & Who Figured Out What**

1) All living things made of cells (could be made of only 1 cell OR more than 1 cell, but all organisms are

 made of cells).

2) Cells are the basic unit of structure + function

3) All cells come have to come from cells that are already here.

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

**Robert Hooke**

\*CONTRIBUTED to #1 because he showed that some organisms are made of cells (cork, etc)

**Anton vanLeeuwenhoek**

\*CONTRIBUTED to #1 because he showed that MANY living things (organisms) are made of cells

\*CONTRIBUTED to #2 and #4 because he saw organisms who were only 1-cell big (unicellular)

 doing everything they needed to survive! If you could keep looking at smaller and smaller

 pieces of an organism, eventually you would get to a cell. They are the basic unit of all

 organisms.

**Schleiden (botanist – studies animals)**

\*CONTRIBUTED to #1 ALL living things (organisms) are made of cells because he looked at so

 many animal tissues and they were all made of cells!

**Schwaan (zoologist-studies plants)**

\*CONTRIBUTED to #1 ALL living things (organisms) are made of cells because he looked at so

 many plant tissues and they were all made of cells!

**Rudolf Virchow**

\*CONTRIBUTED to #3 because he actually saw the cells reproduce.

**Redi & Pasteur - Spontaneous Generation shown to be false!!**

\*CONTRIBUTED to #3 because they both showed that living things can only come from other

living things! Redi worked with multicellular (many-celled) organisms, while Pasteur worked

with unicellular organisms (bacteria).

Whose work is most convincing to you?

Cell Theory to Human Theory?

Some people think that Anton vanLeeuwenhoek’s research was the most amazing because it opened up the possibility that there was an entire “PARALLEL universe”. Cells would have seemed like radical science fiction!!

Now as it is TOLD to you by a teacher or a textbook or on the internet, it might not be as amazing but let us try to see if we can go back in history and FEEL the amazement that the contributors to the cell theory felt. Let’s explore how mind-boggling “cells” must have seemed at the time.

IMAGINE.... that there are humans bigger than us, looking down on the Earth. Many big humans. They OBSERVE us, looking down on us and being amazed. The big humans are very scientific and they study the tiny humans on planet earth using the SCIENTIFIC METHOD.

The big humans find us amazing because they never knew there was an entire society of smaller humans that were living on this tiny little planet. They are amazed because some of the organisms on the Earth are so small they are only 1 cell big (like bacteria). Others are very large and made of many cells (multicellular) (like the humans). So the organisms on the planet are very diverse.

The other amazing thing the big humans OBSERVE about the little humans is that no matter what their size, they all eat, sleep, feed themselves, get rid of their wastes, circulate their nutrients and wastes through their body by blood, respond to stimuli like light (see the handout) and

One day, one of the big humans see how the humans make more of themselves. They are amazed at this as well and they make a CONCLUSION: New humans are made ONLY from other humans.

The big humans notice that as the Earth humans get older, it becomes more difficult for them to fulfill their daily needs like eating, sleeping, feeding themselves, getting rid of their wastes, circulation, responding to stimuli, and

They conclude that the overall health of the humans depends on the health of their individual cells.

The big humans come up with the following theory about the little humans. They call it the

Human Theory:

1. The society is made of humans.
2. Individual humans can do everything they need to survive (like eat, sleep, feed themselves, get rid of wastes, circulate nutrients and waste, respond to stimuli, ). Even the smallest organism can perform these functions.
3. New humans are made only from other pre-existing humans.
4. If all the parts of a human are working well, the human will be healthy. If part of the human is not healthy, the human will be unhealthy.

The big humans design CONTROLLED EXPERIMENTS to learn more about the little humans. For example, they want to know if the humans can survive when certain independent variables are changed. For example, one experiment is designed to measure the effect of a lack of water on the humans’ ability to carry out the function of obtaining food.

Since the INDEPENDENT variable is AMOUNT OF WATER, the control group of humans gets no water and the experimental group of humans get water. The effect of lack of water on the humans’ ability to obtain food is the DEPENDENT variable.