

A Botanical Tale

By Mr. O

Once upon a time, as most people who study living and once living plants, called _____ for short believe, there was a single basic unit of life called a _____. It was alone in the world as it was the first of its kind. However you shouldn't feel too bad for it because it was almost certainly surrounded by many other organic molecules. Not to get too far off track but an organic molecule is one that contains the element _____. Also we should probably specify what kind of cell we are talking about here. Bacteria are _____ as they lack a membrane enclosed nucleus. _____ on the other hand have lots of membranous sacks including one around their nucleus.

So as I was saying this first living thing was most likely a _____ as it lacked internal membranes, and it was surrounded by molecules such as: the building blocks of proteins called _____ and sugars more properly called _____ and the four nucleotides that make up DNA named _____, _____, _____, _____. These molecules are special because they can only bond together in certain combinations. This rule regarding bonding of nucleotides is called the _____. It is very important because it allows DNA to copy itself in a process named _____ but we'll get to that in few more paragraphs.

So here we are, floating in a pool of organic molecules wondering how could this first living thing keep its insides separate from the outside environment? Luckily for it, and us I guess, there were some other molecules in that pool, molecules that had a polar head region and a non-polar tail region. These _____ are very important because with very little coaxing they like to form long sheets. These sheets usually pair up in groups of two. The _____ or water loving heads point outward and the _____ or water hating tails

pointing inward. In this arrangement we now have what can also be called a bi-molecular layer but most people just call it a cell's _____. This region of the cell is probably the most important because it is selectively _____. By only allowing certain things to pass through it the cell is able to maintain the constant state of its internal environment, what scientists like to call _____.

But what good is a stable internal environment unless you have stuff to fill it with. Those little structures inside the cell that do specific jobs are called the _____. There is much debate about where and how they came to be inside the cell but one theory called the _____ gives us a possible explanation. Oh there I go again not properly defining all of my terms but everyone knows that _____ is a mutually beneficial relationship. So we have this prokaryotic cell floating around copying its genetic material and looking for food one day it engulfs another prokaryote. Strangely this engulfed prokaryote is able to breakdown sugars and create a molecule called _____ that contains high-energy bonds. This process of turning sugar into usable cell energy is called _____. Much to its surprise instead of being digested by the larger prokaryote it was enslaved kept alive inside the other and used as a source of energy. Today we call these captured slaves the mitochondria.

That was it, the moment our predecessor was created, and it only took a billion more years of change over time, _____ to those of us who think about these kinds of things. Yeah, yeah I hear you groaning...but how could a single, living _____ have changed to fit its environment? Easy, it _____. See as these first living things grew larger and more numerous they started to depend on and compete with each other. This interrelation of organisms based on the flow of energy is called a _____. Some members of this community fit into the general category of living things that are able to make their own energy

from the sun, a process called _____. The _____ are able to do this because they have the green pigment _____. They keep this green stuff in specialized pouches called _____. There the energy from the _____ is captured and transformed into _____. Unfortunately for them they are eaten by the group of organisms called the _____. In the end we all must accept our fate, to have our physical materials recycled by the _____. For many reasons, including several laws of physics, the _____ from the sun cannot be recycled.

Scientists use experimentation to test their _____. During these experiments separate groups are used. One is the _____, in which conditions are kept the same. The second group is called the _____ and this is the group that is manipulated. As this test is conducted information is recorded called _____. The variable that is being controlled by the experimenter is the _____ variable. The _____ variable is the one that is measured after the other one is manipulated. At times the collection of this information is aided by the use of _____. One particularly important device to biology is the microscope. There are three main varieties of microscope: the first is the one that uses glass lenses to focus light called the _____. The other two are called electron microscopes, they have a much higher _____ or ability to distinguish between to closely positioned objects.

Now that we have these great devices what are they good for? Well we could use them to examine the inside of the cell. It was the advancements in microscopes that allowed the discovery of the organelles. Among the organelles that science has discovered are the sites of polypeptide synthesis called the _____. There are also a series of interconnected tubes called the _____. These tubes transport things to the shipping center

called the _____. This organelle creates membranous pouches that are more properly called _____. These pouches can sometimes contain special enzymes for breaking down cellular materials. These specialized pouches are called _____. One would be remiss to not mention the name of the colloidal material that supports the organelles _____.

Plants have also developed numerous physical adaptations to deal with their environment. One of these is the _____. It is made of _____, which is an indigestible material to most animals. The purpose of the cell wall is to provide _____ and _____. Because plants must store large amounts of water in their _____ they are under constant threat of _____. To prevent this from occurring the cell is surrounded by a rigid box of cellulose. This prevents the cell from swelling too much. The pressure created by the cell membrane pressing against the cell wall is called _____.

Now as we all know by now what good is a whole bunch of little subcellular parts... what we need here is increased surface area. The _____ are the energy producing organelles. To do this they take in _____ and _____ to make ATP. The byproducts of this process are a gas called _____ and a liquid named _____. There is also a fair amount of _____ that is eventually lost to vastness of space. This conversion of energy takes place across a high folded inner membrane called the _____. The energy produced here can be used to do a lot of things. Sometimes it is used to extend the length of a shoot. The process has been named _____. There is a similar process in which the girth of a shoot is increased. This has been termed _____. This growth always takes

place in areas with high _____ . One common area is at the end of a root tip.

This _____ is where all of the new root cells are produced.

After these new root cells are produced they must begin to become larger. They do this in the _____ . From there they travel to the _____ ,

where they begin to take on their final form. Lastly they reach the _____ .

This is where they begin to fully function and act like the grown up cells that they are. Starting in

this zone we also begin to see extensions of the epidermal cells called _____ . Their

job is to _____ to enable greater levels of _____ . Hey that

reminds me! What do you call it when water moves across the cell membrane from an area of

higher concentration to an area of lower concentration? _____ , that's right now I

remember. Well I hope some of what we have learned so far this year has diffused its way in to

your minds. But I guess we'll find out.

I hope your midterm story has a happy ending.

A Botanical Tale – Word Bank

Each word is used only once

1. adapted
2. adenine
3. amino acids
4. apical meristem
5. ATP
6. Bacteria
7. base pairing rule
8. Botanists
9. carbohydrates
10. carbon
11. carbon dioxide
12. cell
13. cell wall
14. cellular respiration
15. cellulose
16. chlorophyll
17. Chloroplasts
18. compound light microscope
19. consumers
20. control group
21. Cristae
22. Cytoplasm
23. cytosine
24. data
25. decomposers
26. dependant
27. ecosystem
28. endoplasmic reticulum
29. energy
30. Eukaryotes
31. evolution
32. experimental group
33. glucose
34. Golgi apparatus
35. guanine
36. heat
37. homeostasis
38. hydrophilic
39. hydrophobic
40. hypothesis
41. independent
42. increase surface area
43. large central water vacuoles
44. lysosomes
45. membrane
46. meristematic potential
47. mitochondria
48. organelles
49. organism
50. osmosis
51. osmotic rupture
52. oxygen
53. permeable
54. phospholipids
55. photosynthesis
56. primary growth
57. producers
58. prokaryotes
59. protection
60. replication
61. resolution
62. ribosome
63. root hairs
64. secondary growth
65. sugar
66. support
67. sun
68. symbiosis
69. symbiotic theory
70. technology
71. thiamine
72. transport protein
73. turgor pressure
74. vesicles
75. water
76. water absorption
77. zone of elongation
78. zone of differentiation
79. zone of maturation