

## Unit 2: Evolution, Change and Diversity

TB Unit 5, p. 368

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## Chapter 7: Evolutionary Theory


TB Ch. 15, p. 369

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*A history leading up to Darwin* (TB 15 - 2, p. 373)

Charles Darwin, writer of *The Origins of Species*, changed the course of scientific history in the early 1800's with his radical theories about natural science, centered mainly around evolution and natural selection.

His theories, however, came at a time when many scientists were presenting new views about the world they lived in, and ultimately changing the way their societies thought about life on Earth.



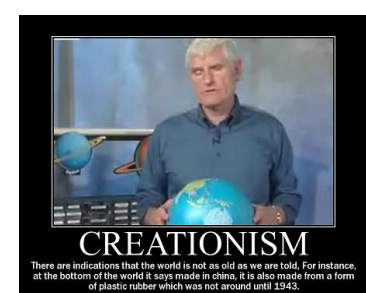
TODAY BEING CHARLES DARWIN'S BIRTHDAY, LET'S BEGIN CLASS WITH A MOMENT OF SILENT EVOLVING.

SUNDAY SCHOOL

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At the time of Darwin's birth, popular European beliefs included:

- the age of the Earth was only a few thousand years old
- the planet was created by a creator
- the Earth and it's inhabitants had not changed since the time of creation in appearance or behaviour.



**CREATIONISM**

There are indications that the world is not as old as we are told. For instance, at the bottom of the world it says made in china, it is also made from a form of plastic rubber which was not around until 1945.


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The 17<sup>th</sup> and 18<sup>th</sup> centuries were filled with scientists who, by exploring the natural world around them, were postulating new hypotheses and theories to explain how the world may have come to look the way it did.

1) James Hutton and Charles Lyell

- Gathered evidence to claim the Earth was millions of years old and that geological processes are slow and still occurring.


Hutton: - layers of rock can be pushed down and buried  
 - layers of rock can be pushed up and exposed to air  
 - all layers can be affected by natural processes such as weather (rain and wind erosion), temperature and pressure



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Lyell: - Processes that have shaped the Earth in the past are still occurring today, and can be observed.

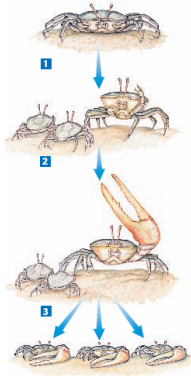
ex: volcanoes spew hot lava onto the Earth  
 earth can be eroded (ex: Colorado River canyon)  
 earthquakes lift ground



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2) Jean-Baptiste Lamarck:

- Observed that organisms change over time.
- Observed that organisms are adapted to their environments.
- Choosing to use or not use an organ could result in the gain or loss of certain traits. These traits are often inheritable.



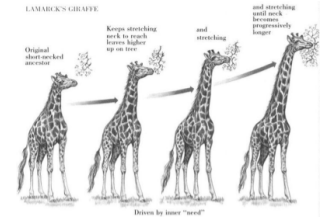
ex: Fiddler crabs use claw to attract mate. Larger claws attract more mates, this trait gets passed on to offspring who will have larger claws.

Figure 15 - 7, p. 376

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Lamarck continued by hypothesizing that:

- all organisms are driving for perfection, and thus continually change.
- by using their bodies in new ways, organisms can develop new features (ex: by trying to fly, organisms can (over time!!) develop wings.)
- traits acquired in one's lifetime could be passed on to offspring.
- Inherited changes could lead to changes in populations, even species. This is the first theory of evolution!



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3) Thomas Malthus:



- observed that the human population was growing, which could lead to reduced, or not enough living space and resources. The population in general was held in check by war, famine and disease.

- others asked: Could this apply to other organisms as well? Some species produce millions of offspring per year! (ex: maple trees)

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