EARLY EVOLUTION: WHO INFLUENCED DARWIN?

EQ: Who paved the way for Darwin's Theory of Evolution?

What is evolution?

- It is the process of biological change by which descendants come to differ from their ancestors.

- Evolution is an attempt

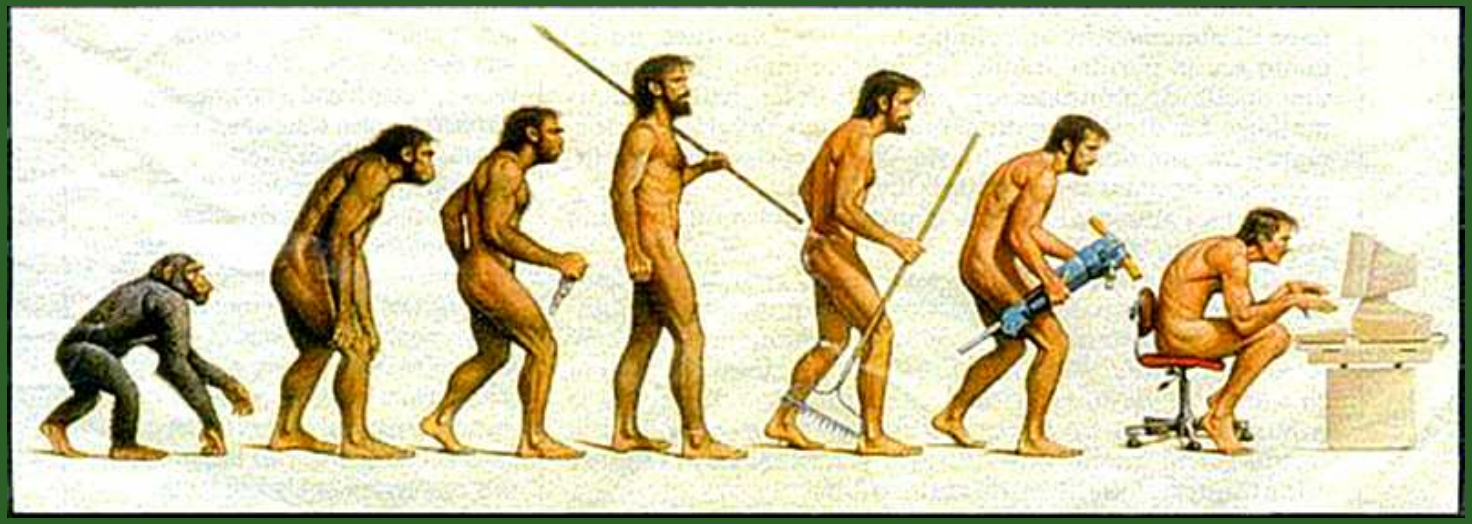
to explain the origins of

living things, including humans.

Who is Darwin?

- Much of today's understanding of evolution is based on Charles Darwin.
  - Darwin is known as the father of modern evolution

- But who influenced Darwin?



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Scientist	Contribution	Significance/ Influence
Hutton		
Lyell		
Malthus		
Lamarck		

Who is Hutton?

- Hutton proposed that rocks form very slowly and are changed by forces that twist, lift and fold them
- He also realized that mountains can be worn down by rain, wind, heat and cold
- In order for these events to occur, he concluded that the Earth must be more than a few thousand years old (the accepted age of Earth at the time)

Who is Lyell?

- He studied sedimentary rock and how the layers (strata) of the Earth form.
- Believed that the geological processes we see today must be the same ones that shaped Earth millions of years ago
- There needed to be enough time in Earth's history for these changes (like a river carving out a canyon) to take place

How did Hutton and Lyell influence Darwin?

- Darwin used this information to conclude that if the different layers of the Earth take thousands of years to form, then the different fossils found in each layer must've taken thousands of years to change or evolve.

Who is Malthus?

- In 1798, Thomas Malthus noticed that people were being born faster than people were dying

- He reasoned that if the human population grew unchecked, there would not be enough living space and food for everyone

How did Malthus influence Darwin?

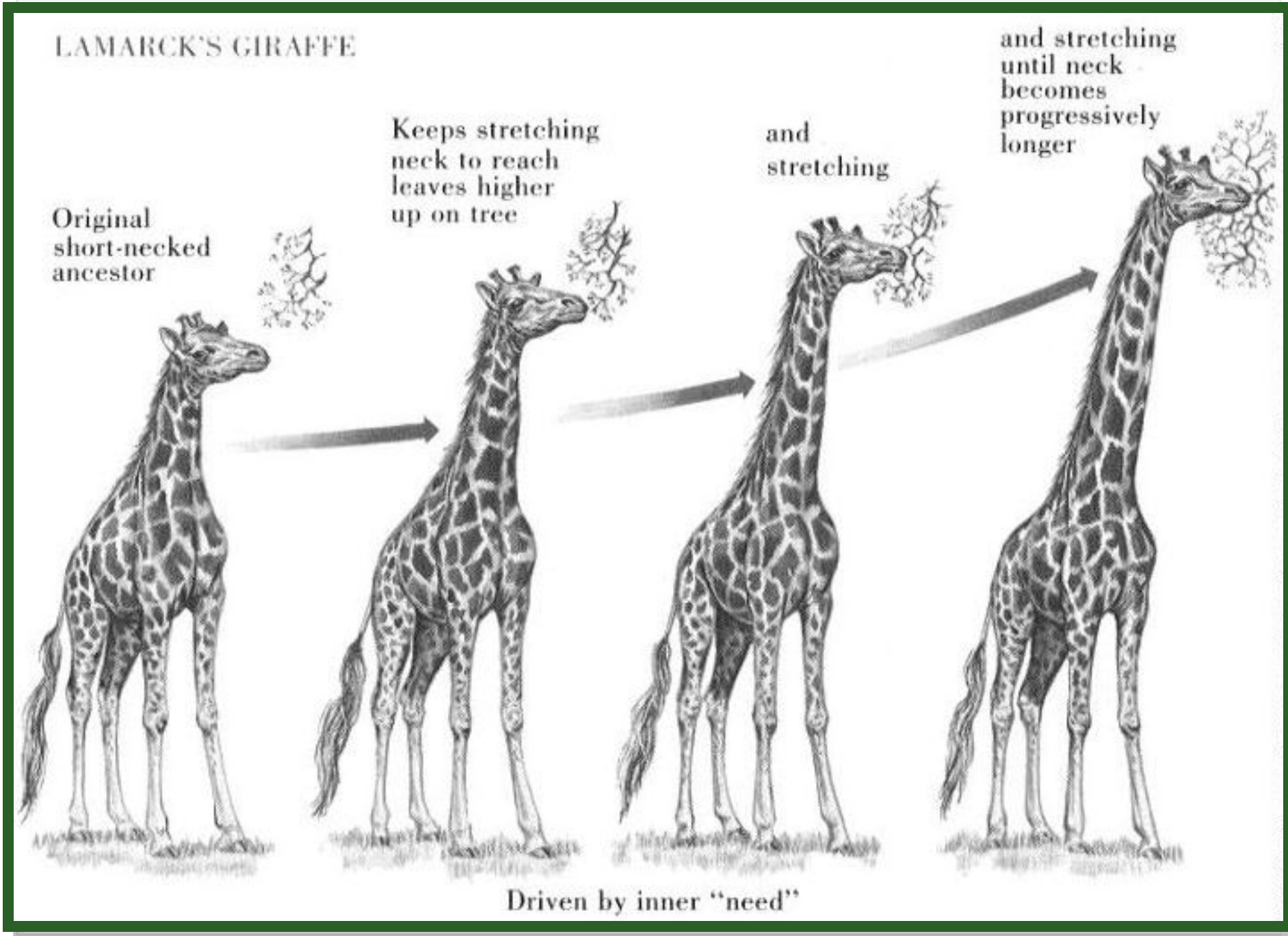
- Darwin reasoned that what Malthus proposed for human populations also applied to all living things.
- He observed that most organisms produce many more offspring than survive.
- He wondered which individuals would survive . . . and why
  - *** All about this later. ***

Who is Lamarck?

- Lamarck proposed that the use or disuse of organs caused organisms to gain or lose traits over time.

- These new characteristics could be passed on to the next generation.

- Ex. - A water bird's long legs happen because the animal kept wading in deeper water to get food.


LAMARCK'S GIRAFFE
Original short-necked ancestor
Keeps stretching neck to reach leaves higher up on tree
and stretching
and stretching until neck becomes progressively longer
Driven by inner "need"

What is the significance of Lamarck?

- While Lamarck's hypotheses were wrong, he was one of the first to:
  - Suggest that species are not fixed
  - Explain that evolution uses natural processes
  - Recognize that there is a link between an organism's environment and its body structures

- Lamarck's work paved the way for later biologists, including Darwin