

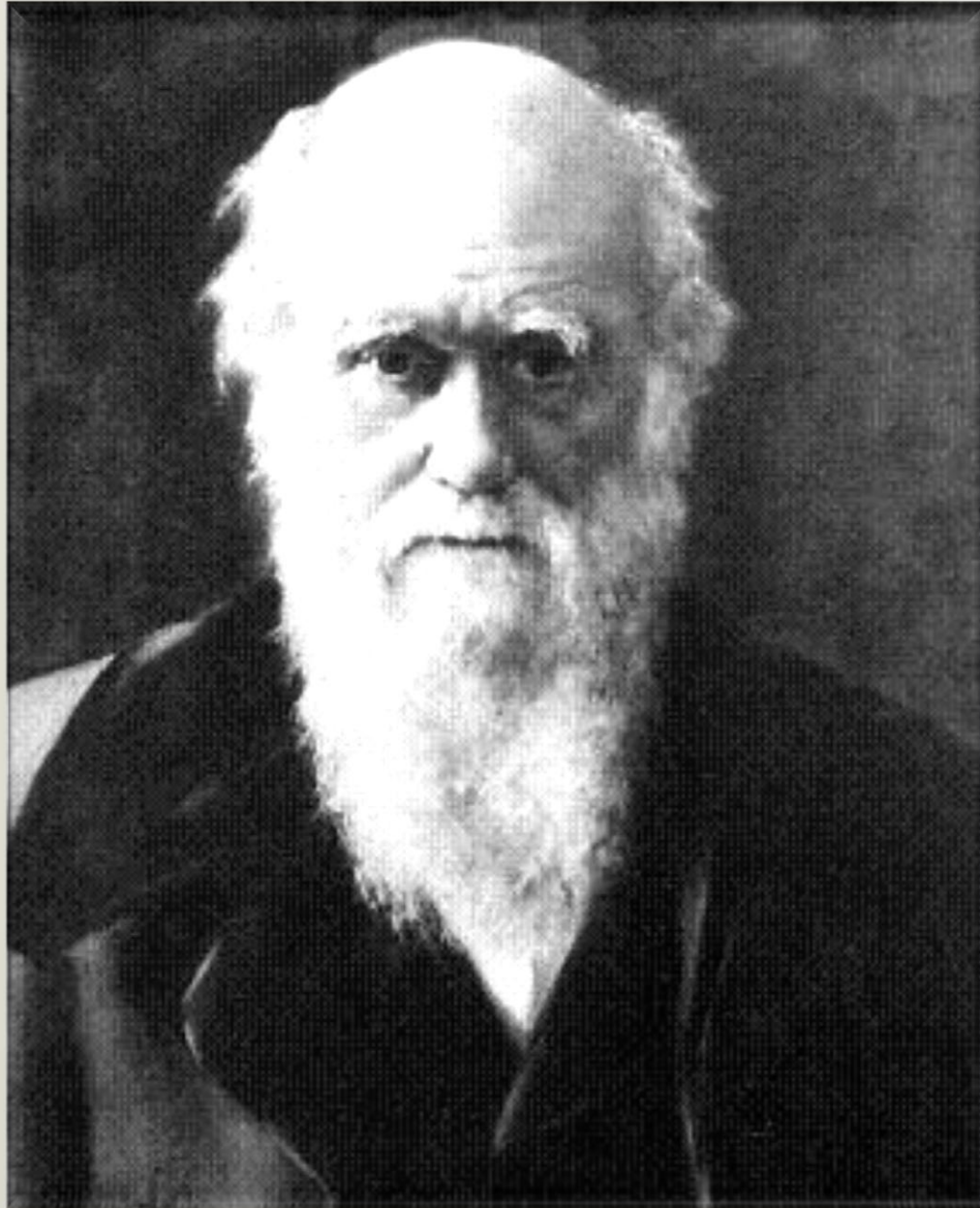
# Evolution

**Lesson: CHARLES DARWIN**

**Overview:**

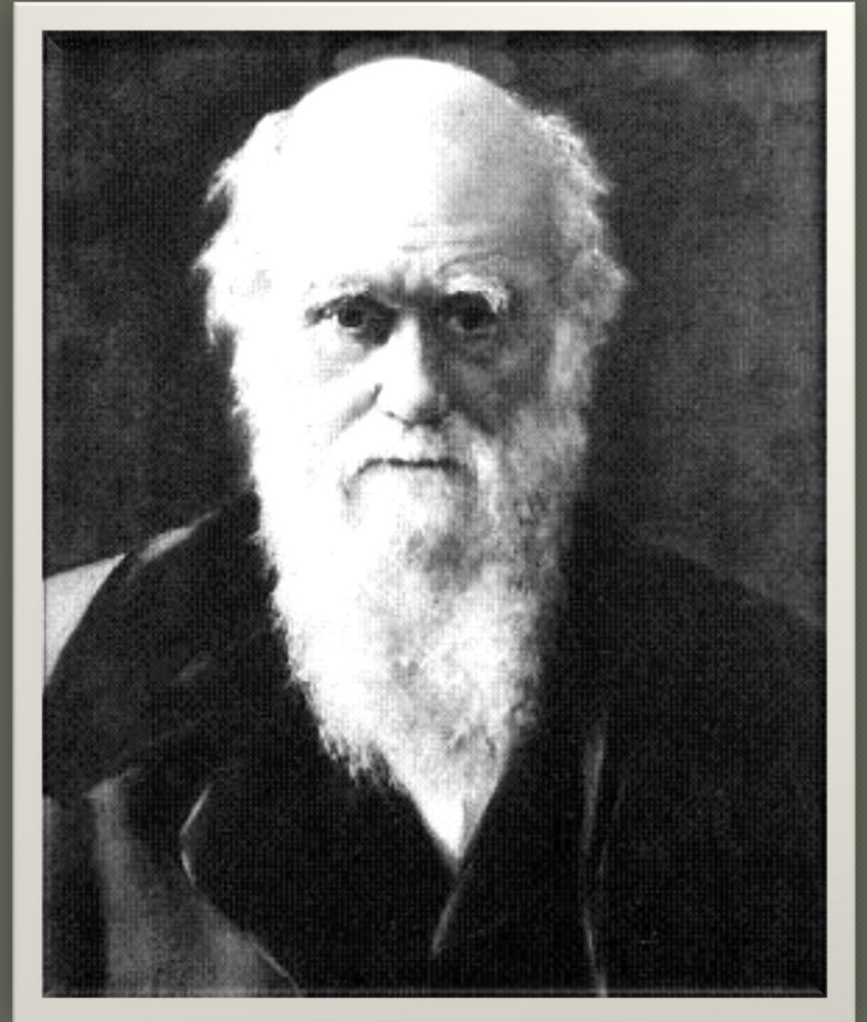
**A look at the life and times of Charles Darwin.**

# Charles Darwin



**Charles Darwin was born in England on February 12, 1809.**

His family was educated and well to do (his grandfather was the maker of Wedgwood china).



**Darwin studied medicine at Edinburgh University but later switched to divinity at Cambridge.**



**Edinburgh University**

In **1831**, he joined a **5 year** scientific expedition on the survey ship **HMS Beagle** as their geologist.



# The voyage was quite extensive...



**At that time, the majority of the population in Europe believed that God had created the world in 7 days, as described in the Bible.**

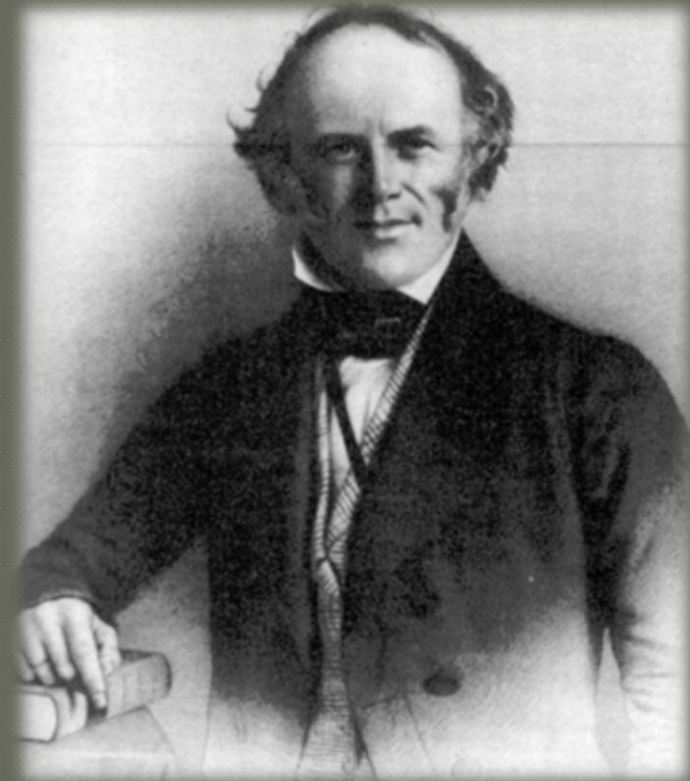
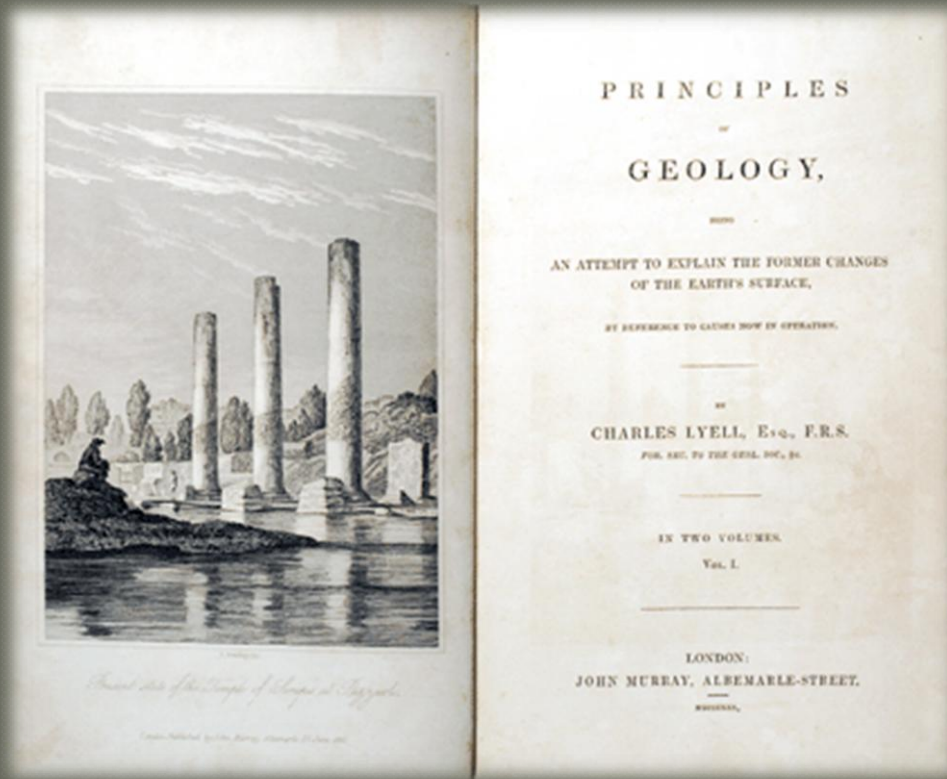


**The idea of evolution had been around for a long time (even before Darwin) and most people (including Darwin) dismissed it due to several reasons:**



- **The lack of a real need**  
(was such a theory really needed?)
- **insufficient time to accomplish significant change**  
(given the supposed 6000 years of Earth history, based on theological interpretations)
- **lack of any real mechanism that might drive evolutionary change**

While on the Beagle, Darwin read a book called “Principles of Geology” by Charles Lyell.



**Lyell suggested that the fossils found in rocks were actually evidence of animals that had lived many thousands or millions of years ago.**

**Lyell's argument was reinforced in Darwin's own mind by the rich variety of animal life and the geological features he saw during his voyage.**

The breakthrough in his ideas came in the **Galapagos Islands**, 500 miles west of **South America**.



Darwin noticed that each island supported its own form of finch which were closely related but differed in important ways.



*Certhidea olivacea*  
Probing bill, insect eater  
Feeds in trees



*Camarhynchus pallidus*  
Probing bill, insect eater  
Uses twig or cactus spine  
to probe insects from cactus



*Camarhynchus heliobates*  
Grasping bill, insect eater  
Feeds in trees



*Camarhynchus crassirostris*  
Crushing bill, cactus seed eater

On his return to England in 1836, Darwin tried to solve the riddles of these observations and the puzzle of how species could evolve.

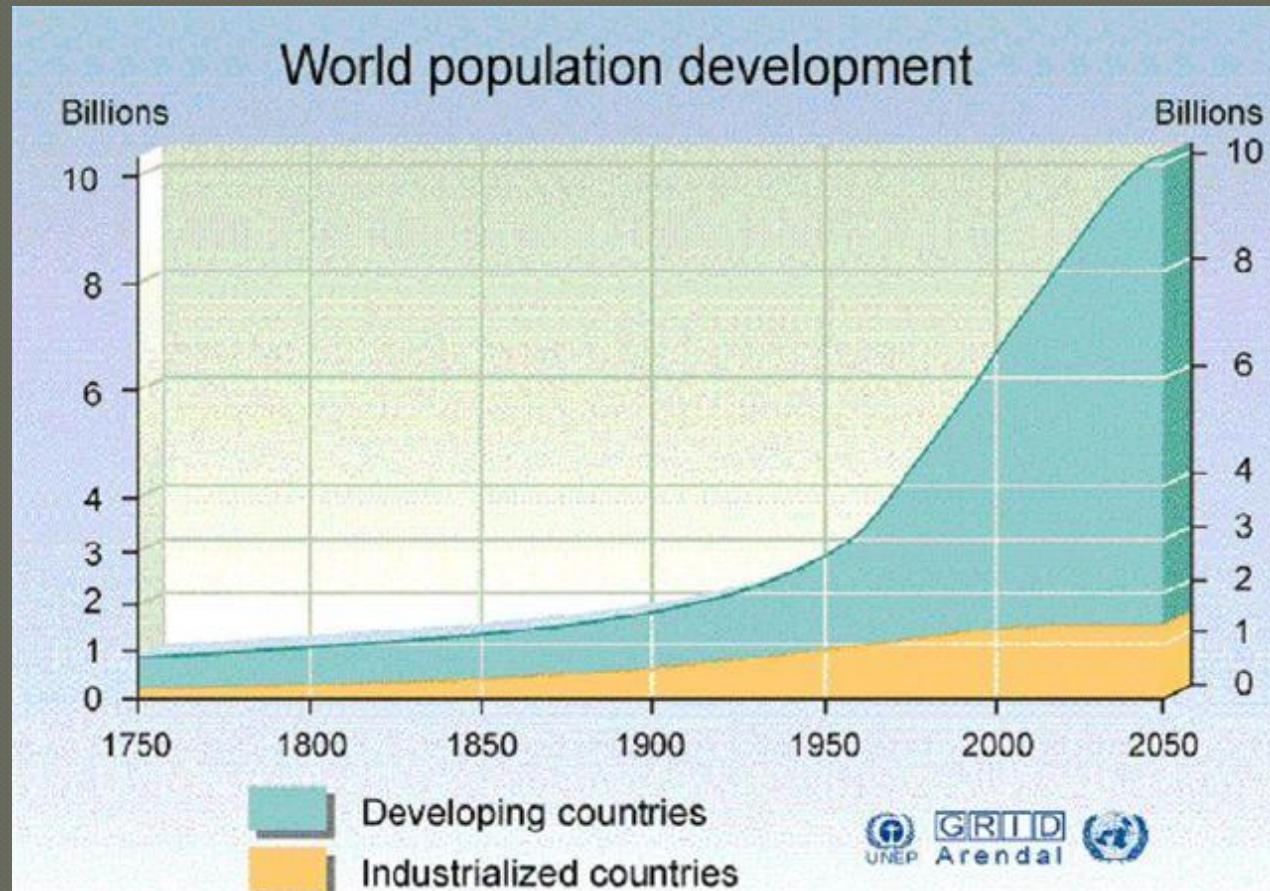
# Thomas Malthus

Another scholar of the time, Thomas Malthus, studied populations and had a great impact on Darwin's understanding of finches, other organisms, and his theory of evolution.



**Malthus** believed that given unlimited resources, a population would grow exponentially.

Under normal conditions, a natural population would be limited by food, water, habitat, etc. resulting in a balancing of population numbers.



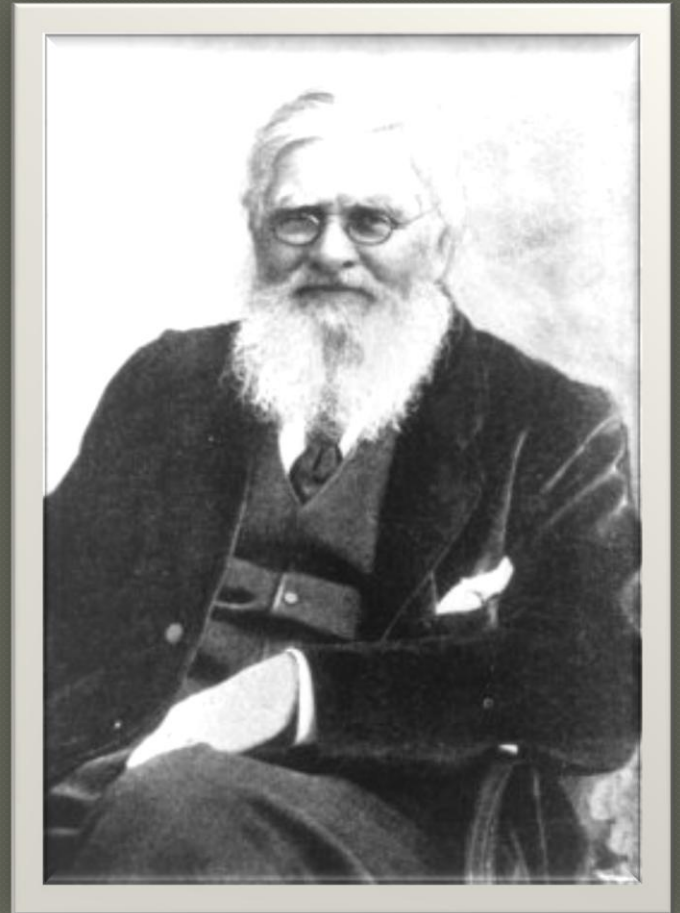


Influenced by the ideas of Malthus, Darwin proposed a theory of evolution occurring by the process of natural selection.

**The animals (or plants) best suited to their environment are more likely to survive and reproduce, passing on the characteristics which helped them survive to their offspring.**

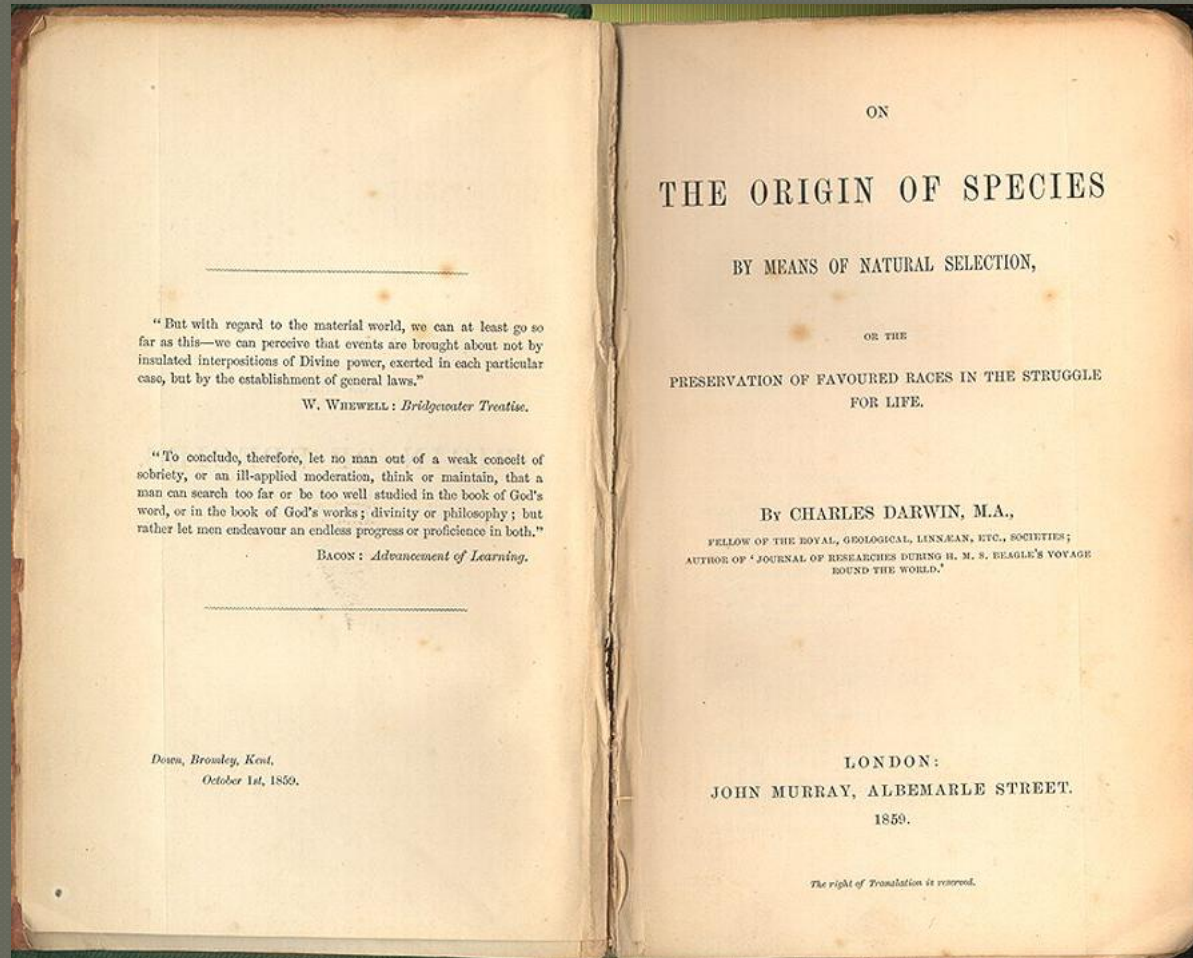
**Gradually, the species changes over time.**

Darwin worked on his theory for **20 years**. After learning that another naturalist, **Alfred Russel Wallace**, had developed similar ideas, the two made a joint announcement of their discovery in **1858**.

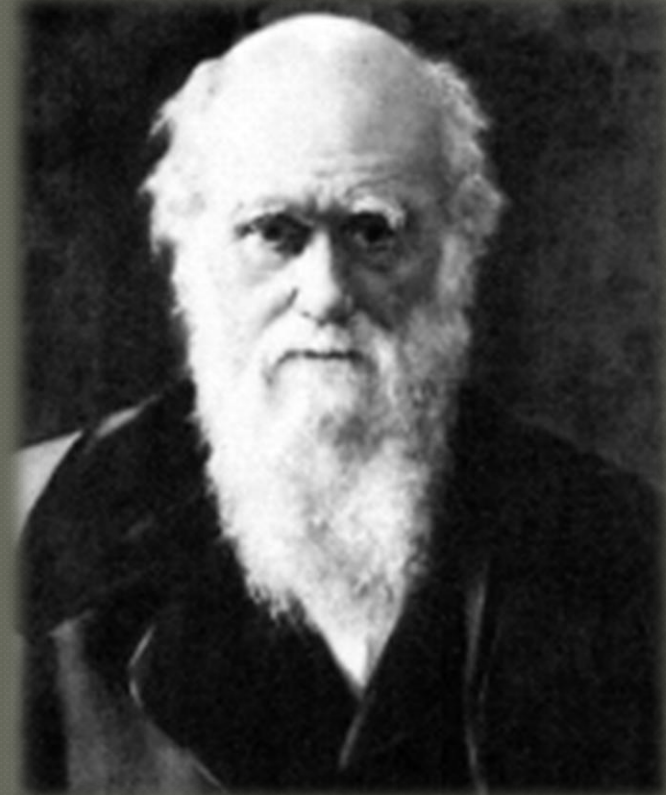
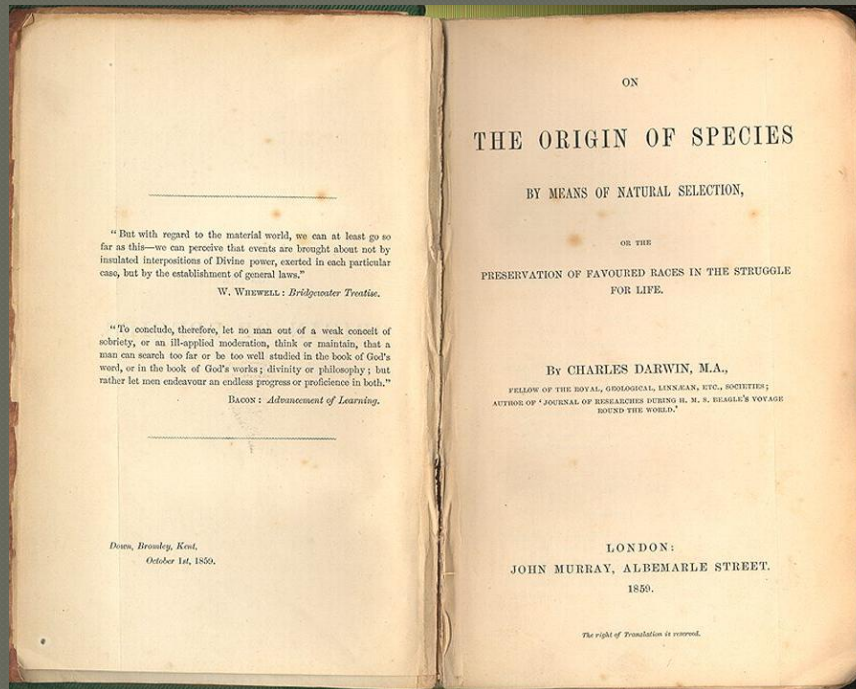


In 1859 Darwin published

# The Origin of Species by Means of Natural Selection'.



The book was extremely controversial, because the logical extension of Darwin's theory was that *Homo sapiens* was simply another form of animal.



Charles Darwin died on April 19, 1882 and was buried in Westminster Abbey alongside Sir Isaac Newton.



CHARLES ROBERT DARWIN  
BORN 12 FEBRUARY 1809  
DIED 19 APRIL 1882