ARISTOTLE
****
367-347 BC -- studied philosophy with Plato in Athens.

Whereas Aristotle's teacher Plato had located ultimate reality in Ideas or eternal forms (Essentialism), knowable only through reflection and reason, Aristotle saw ultimate reality in physical objects, knowable through experience.

Actual Observations -- Accurate descriptions of octopus, cuttlefish, crustaceans, and many other marine invertebrates.

Aristotle described the embryological development of a chick; he distinguished whales and dolphins from fish; he described the social organization of bees.

Animal Classification: those with blood, and those without blood (or at least without red blood).
Roughly: vertebrates and invertebrates.

Blooded animals: viviparous quadrupeds (mammals), birds, oviparous quadrupeds (reptiles and amphibians), fishes, and whales (which Aristotle did not realize were mammals).

Bloodless animals were classified as cephalopods (such as the octopus); crustaceans; insects (which included the spiders, scorpions, and centipedes, in addition to what we now define as insects); shelled animals; and so-called "zoophytes" (plant-like) animals like jellyfish.

LINNAEUS
****
Kingdom: Animalia
Phylum: Cordata
Class: Mammalia
Order: Primates
Family: Hominidae
Genus: Homo
Species: sapiens

(King Phillip came over from Germany stoned.)

(Genus: Upper case. Species: Lower case. Drosophila melanogaster.)

The process of generating new species was not open-ended; whatever new species might have arisen from the original species in the Garden of Eden, were still part of God's plan for creation, for they had always potentially been present.

BUFFON
****
Wrestled with the similarities of humans and apes and
the possibility of their common ancestry.

He argued against the claim that the planet was only 6,000
years old, made by Archbishop James Ussher (4004 BC).
The age of the earth is now thought to be around 4.5 billion years old.

LAMARCK
****
He received a poor man's funeral and was buried in a rented
grave; after five years his body was removed, and no one now
knows where his remains are.

Lamarck viewed evolution as a process of increasing complexity and "perfection,"

> "Nature, in producing in succession every species of animal,
> and beginning with the least perfect or simplest to end her
> work with the most perfect, has gradually complicated
> their structure."

-> Loss of the simple organisms, which Lamarck thought must
be constantly generated spontaneously.

Inheritance of acquired characteristics:

> "A number of known facts proves that the continued use
> of any organ leads to its development"

> "One may perceive that the bird of the shore, which does
> not at all like to swim, and which however needs to draw
> near to the water to find its prey, will be continually
> exposed to sinking in the mud. Wishing to avoid immersing
> its body in the liquid [it] acquires the habit of stretching
> and elongating its legs. The result of this for the generations
> of these birds that continue to live in this manner is that
> the individuals will find themselves elevated as on stilts,
> on long naked legs."

Lines of evidence (similar to Darwin's): Great variety of
animal and plant forms under cultivation; vestigial,
non-functional structures in many animals; and embryonic
structures that have no counterpart in the adult.

MALTHUS
****

At 50 kg per person, one female having two daughters each generation, the number of females on earth in 77 generations would be greater than the mass of the earth (5.974e24 kg).

50 * 2^t for t=77 is 7.555*10^24

Lyell
****

Lyell went to Sicily to investigate the volcano Etna.

He found that the volcano had been built up gradually by a series of small eruptions, the last few of which had been recorded by humans.

Yet, the whole volcano rested on sedimentary rocks that could not be that old, since they contained fossil mollusks very similar to modern day moluscs.

Lyell inferred that geological time must be so vast that even the gradual building of a volcano by small eruptions spanned only a tiny fraction of geological time as measured by the fossil record.

-> Immense geological time frame, gradual change