



**Empedocles (c. 490 – 430 BC)**

**Greek Philosopher**

Thought only some animals and plants survived, others died out.



**Tusi (1201 – 1274)**

**Persian Scholar**

Argued that those organisms that could gain new features could gain an advantage over those that did not and survived.



**Epicurus (341 – 270 BC)**

**Greek Philosopher**

Believed that the goddess Gaia created lots of different species in the past. Only those that functioned the best survived and had offspring.



**Erasmus Darwin (1731 - 1802)**

**English Physician**

Thought that the strongest and most active animals would reproduce.



**Al-Jahiz (776 – 868)**

**Arab Prose Writer**

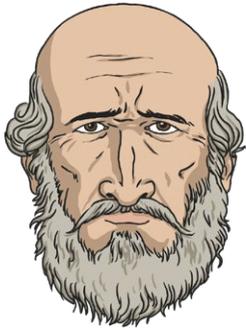
Argued that animals struggled for existence and resources; to breed and avoid being eaten. Those that were successful were better able to survive.



**Thomas Robert Malthus (1766 – 1834)**

**English Cleric and Scholar**

Argued that if populations grew then they would struggle to survive as food would become scarcer. In this case, some would die of disease or hunger and others would live.



**Anaximander of Miletus (c. 610 – 546 BC)**

**Greek Philosopher**

Thought the first animals lived in water during a wet phase of the Earth's past.



**Augustine of Hippo (354 - 430)**

**Bishop and Theologian**

Believed that God created life but that living things had been transformed slowly over time.



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Animals and plants were like disjointed parts of the ones we see now.

Animals and plants that survived seem like they were created that way but it was actually accidental that they did.



**Ibn Khaldun (1332 - 1406)**

**Arab Historian**

Thought living things were able to transform from one thing to another.



**Zhang Zhou (c. 369 – 286 BC)**

**Chinese Philosopher (Taoist)**

Believed that plants and animals did change and that the species were not fixed.



**Pierre Louis Maupertuis (1698 - 1759)**

**French Mathematician and Philosopher**

Proposed that adaptations result in new varieties of the living thing as well as lead to new species.



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Thought all the mammals had descended from as few as 38 original animal types.



**Alfred Wallace (1823 - 1913)**

**British Naturalist and Explorer**

Thought that natural selection caused varieties of the same species based on evidence from observations in South America and Asia.

Emphasised how environmental changes could lead to natural selection (adaptive traits).

## Adaptation and Evolution

**Charles Darwin (1809 - 1882)**

**English Naturalist and Geologist**

Brought together the ideas of natural selection, adaptation and a single origin of life. He went on to state that humans were not separate from all living things but had developed through the same evolutionary process. He emphasised survival of the fittest and the competition that allowed certain varieties to survive due to inherited traits.



The reason Darwin is known for evolutionary theory is the way that he combined the ideas so that they made sense – there was a single origin of life for all living things, that living things changed through adaptations that helped them to survive better in their environment and that these adaptations led to evolution from the original living thing to the ones we see now.

## Natural Selection



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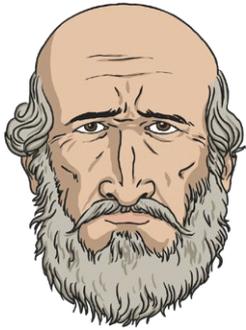
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## Natural Selection



**Pierre Louis Maupertuis (1698 - 1759):**

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Thought modifications occur when living things reproduce.



**Zhang Zhou (c. 369 – 286 BC):**

**Chinese Philosopher (Taoist)**

Taoists thought the environment affected the attributes of different living things.



**Empedocles (c. 490 – 430 BC):**

**Greek Philosopher**

Believed some animals and plants joined in different combinations.



**Georges-Louis Leclerc (1707 – 1788):**

**French Philosopher**

Stated that species were actually just varieties of animals that had been modified from the original animal due to environmental factors.



**Lamarck (1744 – 1829):**

**French Naturalist**

Thought that transmutation (evolution) of species occurred due to inherited traits that helped them adapt to the environment.

**Inherited Traits**

**Adaptive Traits**



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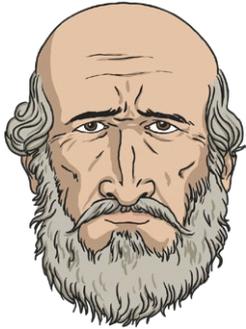
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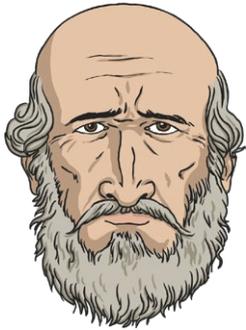
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Thought land dwelling ancestors of humans would have been born in the water and then spent some of their life on land.



**Tusi: (1201-1274):**

**Persian Scholar**

Thought elements mixed and changed to create three types of living things – plants, animals and humans.



**Tusi: (1201-1274):**

**Persian Scholar**

Thought that some animals were more advanced than others and that humans developed from those advanced animals.

Suggested that humans came from apes that lived in Western Sudan (in Africa).



**Erasmus Darwin (1731 - 1802):**

**English Physician**

Said that ‘one and the same kind of living filament is and has been the cause of all organic life’. This means that all living things have a common ancestor.



**Ibn Khaldun (1332 - 1406)**

**Arab Historian**

Stated that humans developed from the world of monkeys by a process that led to numerous species.



**Robert Edmond Grant (1793 – 1874):**

**British Anatomist**

Proposed that animals and plants had a common evolutionary start point from which they then diverged.



**Robert Chambers (1802 – 1871):**  
**Scottish Geologist and Publisher**

Argued that the Solar System and Earth evolved, as well as living things on Earth.

Inherited Traits

Adaptive Traits

Adaptation and Evolution

Natural Selection

Human Evolution

Single Origin of Life