Adult Guidance

Theory of Evolution

Transmutation and Evolution

Transmutation was used to describe how a living thing could 'mutate' from one type of living thing to another. The difference between the theories that discussed transmutation and evolution are as follows:

1. Ideas about transmutation did not refer to specific timeframes for the changes.
2. The mechanism for the change was not detailed, unlike the idea of natural selection.
3. The reasons for the changes were discussed in depth although some did argue that it was due to biological or environmental factors.

Charles Darwin and the Theory of Evolution

It is important that the children understand that Darwin did not come up with the idea of evolution by himself.

The history of thought relating to evolution reflects the reality of scientific theories, where ideas are sometimes abandoned but come into their own with new discoveries or their link with newer ideas.

Darwin read widely and this included books that would have been considered controversial, such as the Vestiges of the Natural History of Creation by Robert Chambers.

The role of the Islamic Scholars is vital here as they not only translated and studied Ancient Greek and Latin texts, they examined, discussed and built on their ideas, which were disseminated to European theorists.

There are also a number of key findings that supported Charles Darwin, and Alfred Wallace, in their journey to their ideas of natural selection:

Fossil Evidence: Over the course of the 19th Century, palaeontology became a specialised field of study. Both Darwin and Wallace examined fossil evidence and used it in support of their ideas. However, Darwin was unsure as to the extent that fossils would support his theory as there were some high profile examples of fake fossils and some genuine mistakes e.g. Thomas Huxley's discovery of Bathybius haeckelii (which he thought was a fossil of a deep sea organism) turned out to be a precipitate of calcium sulphate.

Extinction: Cuvier's definitive theories and supporting evidence relating to extinction of species became widely accepted in scientific circles. Prior to that, many had believed that the only species to have lived on earth were the ones that exist currently.

Travel and Exploration: The fact that Darwin and Wallace were able to travel was an important difference between them and earlier theorists. It allowed them to observe living things and examine fossils, which gave a clearer idea about how evolution and natural selection worked. The variety of finches and nightingales on the Galapagos Islands was significant and this type of diversity in one species is rare. For example, the study of animals in Madagascar, which evolved quite separately from their common ancestors from different species, would not have enabled the same conclusions to have formed. Neither would the same evidence have been collected. Also, fossils are more likely to be found in certain parts of the world and in particular regions in countries – e.g. Jurassic Coast in Devon.

Science: The growth of science and the need for evidence as proof for theories changed the way in which ideas and theories were developed. Theories became less philosophical but the use of evidence enabled a different type of study and debate. Revising and changing theories in the light of evidence became normalised and it opened up the ability of scientists like Darwin to draw on and revise earlier ideas in a more concrete fashion. This was important as evolution was, and to some extent still is, a controversial theory. Without his collection of evidence, it could have been dismissed as easily as some of the ideas relating to transmutation.