

# Charles darwin natural selection

[Science](#), [Biology](#)



Most educated people in Europe and the Americas during the 19th century had heard of or been exposed to Charles Darwin and the concept of evolution. Although he did not invent the idea, he did carry out the necessary research to document that evolution occurred and then made the idea acceptable for scientists and the general public. This was not easy to do, as the idea of evolution was not widely accepted because of the views of the post-revolutionary France. These ideas were considered a threat to the social and political order. Charles Darwin was born in 1809 into a wealthy family; his father had the largest medical practice outside of London and his mother Susan Wedgwood was from a family of wealthy pottery makers. She passed away when Charles was just eight years old. Growing up the times were such that Charles future was mainly mapped out for him. He would go away to a university and study to be a doctor, a military officer or a cleric in the Church of England. Charles started school at 16 in Edinburgh, Scotland as a medical student. He had little interest in medicine and was disgusted by surgery. He ended up dropping up after two years. His father then sent him to Cambridge University to study theology. It was here that he began to change his direction in life. He became very interested in science and the ideas of Adam Sedgwick, a geologist and John Henslow a naturalist that he spent time with collecting specimens. Interestingly enough, at this time in his life he was known to reject the concept of biological evolution, like his mentors, Sedgwick and Henslow did. He had been exposed to evolution earlier while he was a student in Edinburgh. Charles graduated from Cambridge in 1831 with a degree in theology with a degree in theology. Unfortunately for him, he was more interested in biology than he was in

theology. Against his father's initial wishes Charles was able to secure a spot on the H. M. S Beagle as a gentleman companion for the captain, Robert Fitzroy. This was a British navy mapping expedition that was going around the world. Darwin who was only twenty two years old was finally able to convince his father to let him go, and even to pay for his passage. It was on this journey that Darwin became convinced of the earth's geological history through the understanding of uniformitarianism. These preparations along with his research on the voyage were a big step into Darwin accepting the theory of evolution. The five weeks spent in the Galapagos Islands were also important to his comprehension of what causes plants and animals to evolve. It wasn't until another six years later that he really began to formulate his views. The Galapagos Islands have species found only on their islands and in no other part of the world, but there are similar ones that exist on the west coast of South America. What struck Darwin was that there was the slight difference in the birds from one island to another. What he realized was that the differences were because the species lived in different kinds of environments. Darwin began by identifying thirteen species of finches. For him this was odd because he only knew of one species on the mainland, almost six hundred miles away where they had originated from. He also noted that the Galapagos species were different from each other in beak shape and size, and that the differences were associated with the diets based on different foods. From these circumstances he concluded that when the original South American finches reached the islands, they then went to separate environments and had to adapt to different conditions. Generations over, they then changed so that they could get food and survive to

reproduce. This term is known now as adaptive radiation. After a species has become reproductively isolated from each other, they eventually become separate species. Darwin came to the understanding that any population has individuals that slightly differ from each other. It is these variations that give them an advantage to staying alive successfully reproduce and pass on their traits to the next generation. For this reason their traits become more common and the population evolves. Darwin referred to this as "descent with modification". Darwin was excited to find that the Galapagos Islands were the perfect example of this process. What was found in the different finch species is that the ones with beaks better suited for eating cactus got more food, as a result of that they were in better condition to mate. Likewise, those with the beak shapes that were suited to getting nectar from flowers or eating hard seeds in other environments were in a more favorable position than those that were not shaped to suite. As far as Darwin was concerned, nature selected the best adapted varieties to survive and to reproduce. This process has come to be known as natural selection. Darwin was correct in believing that the variation existed and that nature selected the most suitable beak shape against the less useful ones, not that the environment produced the variation, like some seemed to think. Darwin's critics thought that he must have misinterpreted the Galapagos finch data. They seemed to believe that God had created the thirteen different species as they are and that there was no beak evolution as Darwin had suggested. In 1798, Thomas Malthus, an English clergyman and pioneer economist, published *Essay on the Principles of Population*. In it he said that human populations would double every 25 years unless they were kept in check by food supply limits.

After reading Malthus' essay Darwin realized this idea also applied to all plant and animal populations. There is the opportunity for them to increase their numbers as high rate if there isn't the constant threat of predators, diseases and limitations of food. Darwin then came to the conclusion that the most fit individuals in a population are the ones that are least likely to die of starvation and are most likely to pass on their traits to the next generation. Another example of evolution resulting from natural selection is the light and dark peppered moths. These were discovered living near English industrial cities. There are varieties that have light wing and bodies to dark wing and bodies. During the 19th century, soot and smoke from the coal burning kitchens landed on the trees and changed the color of the bark on some trees. What happened was that the lighter moths landing on the darker colored bark were easier to spot by the birds and therefore eaten. But the darker colored moths were able to blend in with the bark so they were able to survive and reproduce therefore displaying the classic case of natural selection. Since then population controls have reduced the heavy air pollutants from reaching the trees, building and other objects in the environment. The bark has grown back to the normal colors and the buildings have been cleaned up therefore the natural selection now favors the lighter colored moth. Darwin did rush all ideas about natural selection to the public or to print. He continued to do research. Because of the widespread Christian teachings during the 1830's and 1840's, he could have been charged with blasphemy for his theories. He eventually married Emma Wedgwood, his first cousin and raised a large family. It was not until he was fifty years old; in 1859 did he finally publish his theories of evolution and

natural selection in a book titled *On the Origin of Species*. This book had six editions by 1872 and there were examples of this theory in fifteen additional scientific books that Darwin published over the next twenty years. Works Cited Caldwell, Roy. "Natural Selection." *Understanding Evolution*. 22 Aug. 2008. The National Science Foundation. 21 Nov. 2008 . Darwin, Charles, and Julian Huxley. *The Origin of Species*. New York: Signet Classics, 2003. O'Neil, Dennis. "Darwin and Natural Selection." *EDU*. 30 May 2008. Palomar. 21 Nov. 2008 .