

# The Exploration and Encounters of Charles Darwin

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Charles Robert Darwin was a British naturalist who helped mankind with his discoveries. He explored the Galapagos Islands along with several other parts of the world (“Brainpop” 2012). In doing so, he encountered several species that were similar to other species he had seen. He explored the idea of evolution taking place through natural selection. He exchanged this idea with other scientists to learn exactly how natural selections would work. Charles Darwin shared his ideas on natural selection in the book The Origin of Species in 1858 (Cook and Konstantinov 2014). It is because of his work that we are able to understand the evolution of species and create other science advancements.

### **Early Years**

Charles Robert Darwin was born on February 12, 1809 in Shrewsbury, United Kingdom. He was the fifth child of Robert and Susannah Darwin. Charles Darwin’s father and grandfather were both rich and well known men (Blackwell and Manar 2015).

Charles Darwin’s mother passed away when was eight, so he was raised by his sisters. In the summer of 1821 when Charles Darwin was twelve years old and on break from school, his sister, Catherine Darwin, was supervising his studies. He wrote to his friend on January fourth of 1822 that one day after the Geography portion of his studies Catherine was asking him questions about his hygiene. He also wrote to his friend in that same letter that his sister asked him if he washed his feet every day and he replied saying, “why I only wash my feet once a month at school.” This statement disgusted his sister and showed that he did not care how clean he was.

As a child, Charles Darwin was not fond of school and was a poor student. He would rather be outdoors, exploring areas near his home. He liked collecting bugs and plants that he would find in those areas and learn their names (Cook and Konstantinov 2014).

Robert Darwin, his father, and Erasmus Darwin , his grandfather, were both successful in their careers, so Charles was expected to be equally successful. Robert Darwin insisted on Charles becoming a doctor, but since Charles did not like school, he did not want to go to even more school to become a doctor. Eventually, Charles decided to go to school to become a doctor to please his father.

While Charles Darwin was attending medical school, he had to observe two operations as they took place. It pained him to witness the patient in so much agony, and he was not able to stay for the entire time of either operation. After the second operation, he decided that he could not become a doctor. He told this to his father, and his father suggested that Charles become a priest instead.

Charles Darwin accepted his father's idea, and went to Cambridge University to get the proper education for becoming a priest. As Charles was attending Cambridge University, he found many people that shared his interest in the outdoors. One person he met was a botany professor named John Stevens Henslow. Charles Darwin and John Henslow became great friends. In fact, Charles Darwin and John Henslow became such great friends and spent so much time together that Charles became known as, “The man who walks with Henslow.” (Student Resources in Context, 2006)

On August 24, 1831, John Henslow sent a letter to Charles Darwin informing him that he had talked to Robert Fitzroy to recommend Charles Darwin for the naturalist position on an expedition that Robert was about to go on with the H.M.S. Beagle.

## **Exploration On the Voyage**

Once Charles Darwin had graduated from Cambridge University in 1831, he returned to his home where he later received a letter from Robert Fitzroy inviting him to go on an expedition on the H.M.S. Beagle as an unpaid naturalist. Charles Darwin accepted this invitation (against the will of his father) and set out with the H.M.S. Beagle on December 27, 1835.

On the voyage of the Beagle, the ship traveled through the Pacific, Atlantic, and Indian Oceans, stopping along the way at various continents and islands. Along the way, they stopped in Argentina, South America. While Charles Darwin was exploring parts of Argentina, he encountered many fossils. These fossils included that of an extinct giant sloth, which looks very similar to the smaller sloth that currently exists. Charles Darwin brought all the fossils that he found with him back onto the H.M.S. Beagle to study them later. The ship sailed away from Argentina and continued its voyage.

While traveling on the H.M.S. Beagle, Charles Darwin was in many places where bathing was not optional. His disregard for hygiene at a young age may have helped him stay comfortable while on the expedition in areas where he could not stay clean.

## **Encounters of Species and Areas**

The Galapagos Islands are volcanic islands and had been around for a long time. As Charles Darwin was exploring the islands, he recorded that they had ten main islands and several smaller islands. Charles Darwin spent several weeks exploring both the highland areas and the lower areas (in the water and on the shore) of the Galapagos Islands. He encountered several species that he had never seen before. Some of these species were Galapagos tortoises and both land and water iguanas (the only sea faring lizards in the world). While on one of the islands,

Charles Darwin met a cook who worked in the Galapagos. He was talking to him, and the cook said that when he was eating a Galapagos tortoise, he could tell which island it was from by the taste and texture. This made Charles Darwin wonder why the taste of each Galapagos tortoise would be different.

As Charles Darwin continued exploring the Galapagos Islands, he encountered the rich biodiversity of them. Sometimes when he encountered a new animal species in the Galapagos Islands, he would make a detailed drawings of them to study later. Charles Darwin noticed that the finches on each of the islands were slightly different from the finches on the other islands. Whenever Charles Darwin encountered a finch that looked different from the others, he would make a detailed drawing that would clearly depict the differences in that bird compared to finches on the other islands. Many of these differences were related to their beaks. Charles Darwin also encountered some animal species that looked similar to other species he had seen while on the expedition with the H.M.S. Beagle.

Charles Darwin returned to England in 1836 and brought all of his findings with him to study later. He had encountered many things that made him wonder such as why the fossilized giant sloth looked so similar to the sloth that was alive in his time and why the finches on each island in the Galapagos Islands had different beak shapes than the finches on each of the other islands. He also wondered why the Galapagos tortoises on each island tasted different from one another and why some of the species in the Galapagos Islands looked similar to species in other parts of the world.

### **Exchange of His Findings**

Charles Darwin returned to England on October 2, 1836 with numerous drawings and notes of species. He studied these notes and drawings as he looked for an explanation to all of his questions. After a lot of studying, Charles Darwin began to think that these species had those differences because of a process which he called natural selection.

Natural selection occurs when individuals of a species have a certain trait that helps them to survive. Because these individuals are able to survive, they are more likely to reproduce than other individuals of that same species, and their offspring are more likely to carry that trait. Therefore, with each generation more individuals in the population will carry that trait, so after several generations, most of the population will have that trait and the species will fit better in its environment.

Natural selection explained why the species on the Galapagos islands resembled other species Charles Darwin had seen. Once a species had migrated to the Galapagos Islands, some individuals had certain traits that helped them survive and reproduce in the new environment. Over generations through natural selection, these traits became more frequent in the species. This altered the species' appearance from the way it looked when it's ancestors migrated to the island.

Evolution takes place over long periods of time. However, The Church of England taught that the Earth was not very old and there could not have been enough time for evolution to take place. Because Charles Darwin was trained to become a priest, he had a strong belief in what the church taught and it was hard for him to admit that species evolved from their original form. In a letter Charles Darwin sent to Hooker on January 11, 1844, he said, "At last gleams of light have

come, and I am almost convinced (quite on the contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable.”

In 1858, a man from the United Kingdom by the name of Alfred Russel Wallace sent a letter to Charles Darwin, exchanging his thoughts on evolution taking place through natural selection. He had gone on an expedition alone to the Malay Archipelago that lasted eight years. Over these 8 years, Alfred Wallace made observations that later led him to propose a theory of evolution that was quite compatible with Darwin’s ideas and also suggested that evolution took place through natural selection. He wished to have Darwin review his thoughts on evolution before publishing his findings, so he sent a letter expressing his thoughts on natural selection. Charles Darwin saw how similar Alfred Wallace’s thoughts were to his own, and consequently, he decided to publicize his findings. He had been developing the theory for twenty years so that he would have enough evidence.

Charles Darwin published his findings in 1858 in a book called The Origin of Species. In his book, he wrote “We see leaf-eating insects green, and bark-feeders mottled-grey; the alpine ptarmigan white in winter, the red-grouse the colour[sic] of heather, we must believe that these tints are of service to these birds and insects in preserving them from danger.” These are just a few examples of the effects of natural selection on species that he used to exchange his ideas with the rest of the world.

The Church of England did not agree with Charles Darwin’s thoughts on evolution through natural selection. Many people in the Church of England did not accept his theories but there were other scientists that accepted his thoughts. Now the thought of evolution through natural selection is better accepted and is applied in agriculture and treating diseases.

The exchange for Charles Darwin's work is that we now have the theory of evolution by natural selection of species. The theory of evolution by natural selection is extremely important because it has helped mankind many times. It is important because it explains why the natural world looks and works the way that it does. Charles Darwin going on the voyage of the H.M.S. Beagle enabled him to come up with the theory of evolution by natural selection of species, and therefore was an extremely important man in history. It is through this exchange of ideas that we are able to understand the evolution of species and we have used this information to create other scientific advancements.



## Annotated Bibliography

### Primary

Darwin, Charles. "Birds in the Galapagos Archipelago, September 1835." Gale World History in Context. Detroit: Gale, 2014. Student Resources in Context. Web. 19 Nov. 2015

This first hand account helped me understand the wildlife in the Galapagos Islands better. I also learned that the birds on the Islands were not bothered at all by humans.

Darwin, Charles Robert. Letter to Dear Friend. 4 Jan. 1822. MS. Web.

This letter that Charles Darwin wrote to his friend is a primary source, and it helped me understand what it was like in his childhood. I learned that he had a disregard for personal hygiene.

Darwin, Charles. Letter to Hooker. 11 Jan. 1844. Web.

This letter was a primary source and it helped me understand Charles Darwin's thoughts towards his work and discoveries. I learned that it was hard for him to admit that evolution takes place over time.

Darwin, Charles Robert. Letter to John Stevens Henslow. 30 Aug. 1831. MS. Web.

This letter sent from Charles Darwin to John Stephens Henslow was a primary source and helped me understand his circumstance with accepting the invitation to the Beagle. I learned that if it weren't for his father, Charles Darwin would have accepted the invitation to join the Beagle immediately.

Darwin, Charles. The Decent of Man. Print. 2015

This book helped me understand how humans have evolved. It also helped me understand how Charles Darwin's theory of Natural Selection works.

Darwin, Charles. The Origin of Species. Print. 2015

This book helped me gain a better knowledge of Charles Darwin's theory of natural selection. It taught me that species are fit perfectly to their surroundings.

Darwin, Charles. *The Voyage of the Beagle*. Print. 2015

This autobiography of Charles Darwin helped me understand what he observed on the Galapagos Islands. It also helped me understand the characteristics of the islands.

Henslow, John Stevens. Letter to Charles Robert Darwin. 24 Aug. 1831. MS. Web.

This letter to Charles Darwin helped me understand how Charles Darwin got accepted on the Beagle. I learned that John Stevens Henslow recommended Charles Darwin as a naturalist on the H.M.S. Beagle to Robert Fitzroy.

## **Secondary**

1996-2015 National Geographic Society. Web. 2015.

This documentary of the Galapagos Islands helped me understand what the wildlife on the Galapagos Islands is like. It also helped me understand how amazed Charles Darwin was when he visited the islands.

"Alfred Russel Wallace". *Encyclopædia Britannica*. Encyclopædia Britannica Online. Encyclopædia Britannica Inc., 2016. Web. 02 Jan. 2016.

This secondary source helped me understand Alfred Russel Wallace's home circumstances. I learned that his family was poor.

"Alfred Russel Wallace." *Encyclopedia of World Biography*. Detroit: Gale, 1998. Student Resources in Context. Web. 12 Jan. 2016.

This secondary source helped me understand who Alfred Russel Wallace was. I learned that he sent a letter to Charles Darwin on July 1, 1858.

"Alfred Russel Wallace." *Science and Its Times*. Ed. Neil Schlager and Josh Lauer. Vol. 5. Detroit: Gale, 2000. Student Resources in Context. Web. 16 Dec. 2015.

This secondary source helped me understand who Alfred Russel Wallace was. I learned that he went on an expedition alone for eight years and came up with his own theory of evolution by natural selection.

Barter, James. *The Galapagos Islands*. 1946. Print. 2015.

This source was used to learn about the Galapagos Islands. It helped me understand my topic because it helped me understand what it is like at the Galapagos islands. It was a secondary source.

Blashfield, Jean. *Wonders of the World; Galapagos Islands*. Print. 2015.

This secondary source helped me understand the biodiversity on the Galapagos Islands. It also informed me of all the many species that live only on those islands.

Brain Pop. 1999–2015 BrainPOP, 21 Nov. 2012. Web. 2015.

This secondary source about Charles Darwin helped me understand that the mocking birds on the different islands in the Galapagos Archipelago had slight changes on them. I learned that Charles Darwin noticed these changes and used them to come up with the theory of natural selection.

Charles Darwin by David C. King from the Public Library. Print. 2015.

This secondary source about Charles Darwin helped me understand how he died. I learned that he died when he was 73 years old by a series of heart attacks.

"Charles Darwin." *Scientists: Their Lives and Works*. Detroit: UXL, 2006. Student Resources in Context. Web. 29 Dec. 2015.

This secondary source helped me understand Charles Darwin's view of the Beagle better. I learned that he had a great passion for the outdoors.

"Charles Darwin." *World of Scientific Discovery*. Gale, 2006. Student Resources in Context. Web. 21 Dec. 2015.

This secondary source helped me understand how other people helped Charles Darwin. I learned who John Stephens Henslow was.

"Charles Robert Darwin." *Science and Its Times*. Ed. Neil Schlager and Josh Lauer. Vol. 5. Detroit: Gale, 2000. *Student Resources in Context*. Web. 28 Dec. 2015.

This secondary source helped me understand who was in his family. I learned that he had four kids.

"Charles Darwin." *UXL Encyclopedia of Science*. Ed. Amy Hackney Blackwell and Elizabeth Manar. 3rd ed. Farmington Hills, MI: UXL, 2015. *Student Resources in Context*. Web. 15 Dec. 2015.

This secondary source helped me understand what it was like for Charles Darwin on and after the Voyage of the Beagle. I learned that once the Beagle got back to England, he talked to plant and bird experts about his findings on the Voyage of the Beagle.

"Charles Robert Darwin." *Encyclopedia of World Biography*. Detroit: Gale, 1998. *Student Resources in Context*. Web. 17 Dec. 2015.

This secondary source helped me understand what he found while on the Beagle. I learned that he he spent 535 days on sea, and about 1,200 days on land.

Cook and Konstantinov, Dian and Vitali. *People of Importance : Charles Darwin British Naturalist*. Print. 2015.

This source was used to help me learn about Charles Darwin. It helped me understand my topic by giving me background knowledge of Charles Darwin. This was a secondary source.

*Darwin Was Right*. Copyright 2012-2015 DarwinWasRight.org. Web. 2016.

This secondary source helped me understand how natural selection is helpful today. I learned that it is used in treating diseases.

Nardo, Don. *The Theory of Evolution A History of Life on Earth*. 2010. Print. 2015.

This secondary source helped me understand that Charles Darwin's theory of evolution was useful because it was correct. I learned that scientists doubted his theory, but it was later proven to be correct.

"Natural Selection: Charles Darwin & Alfred Russel Wallace." *Understanding Evolution*. Web. 28 Mar. 2016.

This secondary source helped me better understand the long term effects of natural selection. I learned that similar species have a common ancestor evolved to better fit their environment as they move to a new habitat.

"Population and Evolutionary Genetics." *Darwin's Theory of Evolution by Natural Selection*. Phillip McClean, 1997. Web. 3 Jan. 2016.

This secondary source gave me a better understand of the theory of evolution through natural selection. I learned that with a species, there are special traits that allow some individuals to survive, so in the next generation, more of the population will have those traits.

*Understanding Evolution*. 2015. University of California Museum of Paleontology. 22 August 2008. Web. 2015.

This secondary source helped me understand how natural selection works. I learned that small mutations will take place within an organism and make change in the organism's appearance.