

Precursors to the theory of evolution



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“ In the eighteenth century, Swedish botanist Carolus Linnaeus (1707-78) had brought order to the explosion of knowledge in the organic realm... by arranging plants and animals in the ‘ binomial’ system of classification still in use today. ” (McClellan, 2006, p.

325.) It was another 60 years before the birth of Charles Darwin, and more still before he began his own research into the theory of evolution.

A vast amount of research had been done in the century before Darwin’s birth in the areas of botany, natural history, and geology, mostly as a result of the reconciliation of science and religion and the newfound interest in the study of natural theology. There was so much new information to enter into the scientific record, and research might not have advanced as far as it did or as quickly had it not been for the contribution of Linnaeus.

His binomial system of classifying species gave stability to the dissemination of all of this new knowledge and did so with an ease and clarity that enabled its widespread use and adoption by the scientific world.

Linnaean classification put new focus on all the world’s different species and the variation within them. Charles Robert Darwin (1809-1882) has often been heralded as the “ father of evolution” and certainly no less so today in the 200th year after his birth.

If one looks back into the history evolutionary theory, however, and not just Darwin’s role in it, a rich history emerges involving numerous scientists and the confluence of their scientific discoveries. Just as the evolution of a species describes how it came to be through a process of natural selection

occurring over time, scientific breakthroughs are the result of a process developed over time as scientific thought always has some basis on the observed and recorded scientific studies of the past.

Scientific innovation is never the result of just one event or the sole work of one scientist.

Darwin's seminal work, *The Origin of Species*, is the culmination of the ideas of many scientists who were all important precursors to Darwin's arriving at his theory of evolution by natural selection. Charles Darwin is remembered today because he applied the principle of natural selection as the main mechanism for evolution change and proposed his theory along with vast amounts of scientific evidence to support it.

Previous theories on the transmutation of species had been put forth, logically debated, and some proposals even published well before Darwin's publication, but aside from the independent discoveries of Alfred Russel Wallace, none of these past conjectures were able to credibly account for the biological transformation of species, and hence, were not generally accepted as a viable counterpoint to previous notions about the fixity of species and the approximate age of the earth as suggested by Christianity.

The Count de Buffon (1707-88), a French naturalist, proposed a theory that species devolved over time, rather than evolved, from their more robust ancestors. His ideas never had much standing, however, because he never gave any explanation as to why or how this was even possible.

Jean-Baptiste Lamarck (1744-1829), another French naturalist, postulated that an organism would modify itself in order to adapt to its environment and that these modifications were then passed on to its offspring.

This mechanism, known as the inheritance of acquired characteristics, provided an explanation of how evolution could occur yet did not explicitly contradict the age of the earth according to biblical interpretation. This appealing explanation of evolutionary change led to the theory gaining acceptance by many in the scientific world. Lamarck's ideas had some popularity even with Darwin himself.

Darwin's grandfather, Erasmus Darwin (1731-1802), published his own ideas in the form of scientific poems. While his publications were not scientifically rigorous, they were still respected and influential to the younger Charles Darwin.

Erasmus had views very similar to those of Lamarck's, but his notion that beings were formed from the slow accumulation of useful traits required that the earth be substantially older than people at that time were willing to accept.

Towards the end of the eighteenth century, many scientists were beginning to suspect that the age of the earth was much older than previously thought, and in 1800 an important fossil discovery provided evidence of biological extinction, a notion that further suggested the passing of long periods of time. A theory called catastrophism tried to explain how the earth could undergo great changes in only a brief amount of time. When this was successfully challenged by the idea of uniformitarianism, however, it was

then the popular consensus that the biblical account of the earth was in error.

A major proponent of uniformitarianism was Charles Lyell (1797-1875). It was his three-volume work, *Principles of Geology*, which Darwin read while voyaging the earth on board the HMS Beagle. By the end of his five-year circumnavigation of the earth, Darwin was wholly convinced of the fact of biological evolution but needed to come up with a reason for why it occurred in order to complete the theory. The missing piece of the puzzle came to him about a year after his return.

In 1838, Darwin was able to account for the biological transformation of species by adapting a principle put forth forty years earlier by the Reverend Thomas Robert Malthus in his *Essay on the Principle of Population*.

Regarding human population, Malthus postulated that “ as population necessarily outpaces food production, competition for resources becomes increasingly fierce, a competition in which the swifter, stronger, hardier, and more cunning are most likely to survive and reproduce. ” (McLellan, 2006, p. 331. Darwin transferred this “ theory of natural selection” to plants and animals, thereby finally possessing an explanation that would encompass the patterns of variations in species and observations he had made on his voyage. Darwin did not publish his important discovery right away. He had trepidation in announcing publicly his discovery before he had more substantiated evidence to back up his argument.

Instead, he spent the next twenty years publishing his research in other areas of biology, thereby establishing his renown as a leading naturalist as well as a rigorous systematist.

The news that Alfred Russel Wallace (1823-1913) had arrived independently at the same conclusion of natural selection came in 1858, forcing Darwin to rush the announcement of his own discovery with the help of friends he had been writing to informally on the subject. The two scientists were then named co-discoverers and about a year later Darwin completed and published his well-received book, *The Origin of Species*. It is clear that Darwin arrived at the theory of evolution by natural selection with in-depth consideration of the theories put forth by many other scientists before him.