

Darwin's Theory of Evolution

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Darwin's Theory of Evolution is the widely held notion that all life is related and has descended from a common ancestor: the birds and the bananas, the fishes and the flowers – are all related. Darwin's general theory presumes the development of life from non-life and stresses a purely naturalistic (undirected) "descent with modification". That is, complex creatures evolve from more simplistic ancestors naturally over time. In a nutshell, as random genetic mutations occur within an organism's genetic code, the beneficial mutations are preserved because they aid survival - a process known as "natural selection." These beneficial mutations are passed on to the next generation. Over time, beneficial mutations accumulate and the result is an entirely different organism (not just a variation of the original, but an entirely different creature).

In this case study I intend to question whether Darwin's theory is as relevant today as it was in 1859, and how it matches up to evidence from the past 150 years since the publication of *The Origin of the Species*. I intend to look at recent evidence for and against this groundbreaking theory, which is controversial even today.

Evolution's biggest rival is creationism. Creationism is one of the oldest theories in the world, and one of the most believed. Creationism is a religious belief that a higher being created the world and all that resides within it. This theory completely opposes Darwin's theory, which cites no divine intervention. Darwin found many roadblocks while writing and researching his theory, and faced much opposition from the church and many religious leaders as this theory directly contradicted their teachings.

Creationists would argue that all life seems designed and scientists can't explain why, so they use the explanation of divine intervention; and they would also argue that people's brains and minds are separate from one another which could lead them to dwell on, yet again, divine intervention.

Darwin first became interested in species while on a navy ship heading to the Galapagos Islands. The Galapagos Islands have species found in no other part of the world, though similar ones exist on the west coast of South America. Darwin was struck by the fact that the birds were slightly different from one island to another. He realized the reason this difference existed was connected with the fact that the various species live in different kinds of environments.

This was the first part of his road to discovery.

Darwin identified 13 species of finches in the Galapagos Islands. This was puzzling since he knew of only one species of this bird on the mainland of South America, nearly 600 miles to the east, where they had all presumably originated. He observed that the Galapagos species differed from each other in beak size and shape. He also noted that the beak varieties were associated with diets based on different foods. He concluded that when the original South American finches reached the islands, they dispersed to different environments where they had to adapt to different conditions. Over many generations, they changed anatomically in ways that allowed them to get enough food and survive to reproduce [Figure 1].

Nineteenth century critics of Darwin thought that he had misinterpreted the Galapagos finch data. They

said that God had created the 13 different species as they are and that no evolution in beak shape had ever occurred. It was difficult to conclusively refute such counter arguments at that time. However, 20th century field research has proven Darwin correct.

Today we use the term adaptive radiation to refer to this sort of branching evolution in which different populations of a species become reproductively isolated from each other by adapting to different ecological niches and eventually become separate species [Figure 2].

Darwin came to understand that any population consists of individuals that are all slightly different from one another. Those individuals with a variation that gives them an advantage in staying alive long enough to successfully reproduce are the ones that pass on their traits more frequently to the next generation. Subsequently, their traits become more common and the population evolves. Darwin called this “descent with modification”.

But as always to every argument there is a counter

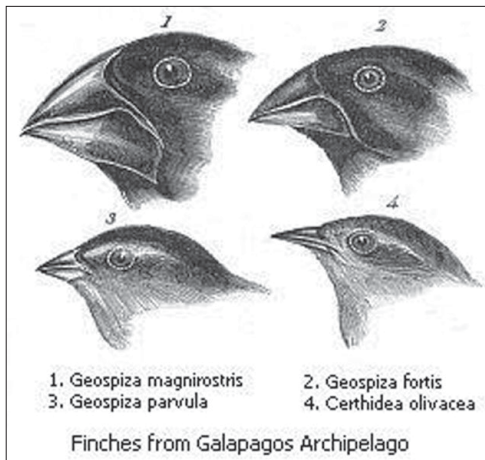


Figure 1: Shows adaptive radiation in Galapagos finches

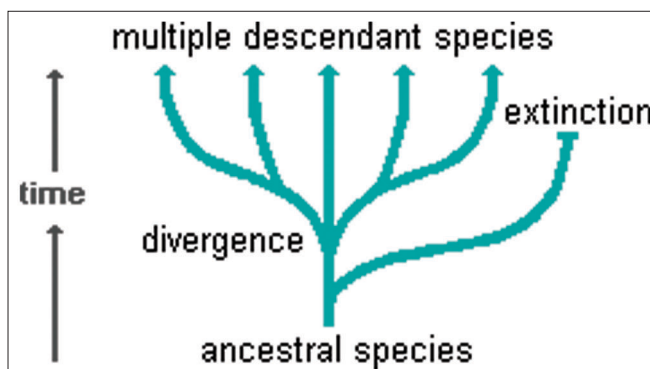


Figure 2: Shows a diagram depicting natural selection

argument, as creationists believe they can disprove spontaneous generation of life -“Louis Pasteur disproved spontaneous generation of life. Sir Fred Hoyle and Charles Wickramasinghe stated in their book, *Evolution from Space*, that “they estimated the probability of forming a single enzyme or protein at random, in a rich ocean of amino acids, was no more than one in 10 to the 20th power.” Next, they calculated the likelihood of forming all of the 2000+ enzymes used in the life forms of earth. This probability was calculated at one in 10 to the 40,000th power. They popularized the following cliché: “belief in the chemical evolution of the first cell from lifeless chemicals is equivalent to believing that a tornado could sweep through a junkyard and form a Boeing 747.” (Quote: www.allaboutcreation.org).

The latest theory regarding the evolution of man (*sapiens sapiens*) suggests that modern humans and apes originate from an apelike ancestor that resided on earth. The theory states that man, through a mixture of environmental and genetic factors, emerged as a species to produce the diversity of ethnicities seen today, while modern apes evolved on a separate evolutionary pathway. Mankind’s origin has usually been explained from an evolutionary perspective. In addition, the theory of man’s evolution has been and continues to be modified as new findings are discovered, revisions to the theory are adopted, and past concepts proven incorrect are discarded [Figure 3].

“One of the foremost evidences for the evolution of man is homology, that is, the resemblance of either anatomical or genetic features between species. For instance, the similarity in the skeleton structure of apes and humans has been correlated to the homologous genetic sequences inside each species as strong confirmation for common ancestry.

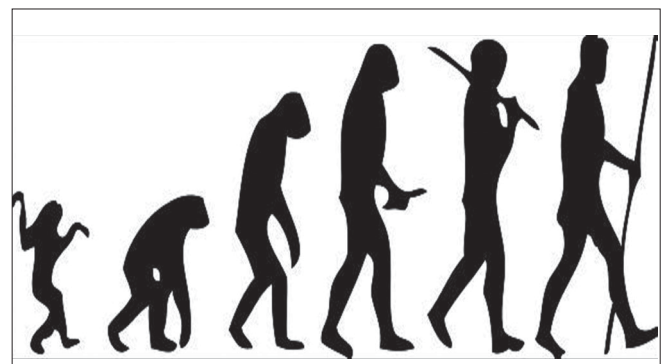


Fig 3: Ascension of man, showing how modern humans might have evolved.

This argument contains the major assumption that similarity equals relatedness. In other words, the more comparable two species appear, the more closely they are related to one another. This is known to be a poor assumption. Two species can have homologous anatomy even though they are not related in any way. This is called “convergence” in evolutionary terms. It is now known that homologous features can be generated from entirely different gene segments within different unrelated species. The reality of convergence implies that anatomical features arise because of the need for specific functionality, which is a serious blow to the concept of homology and ancestry.” (Quote modified: www.allaboutscience.org).

In conclusion, I think evolution is the most logical explanation for the creation of man but creationism

still has many valid points and it comes down to choosing what you believe in. Even today the word “evolution” is not used in the state of Kansas’s science curriculum. To fully understand your own view you need to understand a different view and I feel that some creationists are being very close-minded when it comes to learning and understanding a viewpoint different to their own.

Resources

- <http://www.allaboutscience.org/darwins-theory-of-evolution.htm>
 - http://anthro.palomar.edu/evolve/evolve_2.htm
 - <http://www.allaboutcreation.org/evidence-against-evolution-faq.htm>
 - <http://www.media-2.web.britannica.com> (finch diagram)
 - <http://www.juliantrubin.com> (ascension of man diagram)
- Evolution 101 podcast