

# Medicine in Stamps

## Charles Darwin (1809-1882): history's most famous naturalist

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The embryonic science of geology came into being in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries, and it calculated the true age of Earth to be 4,000 million years rather than the biblical version of 6,000 years. Both geological and fossil research generated interest in the origin of species and more importantly, the origin of man. Though some in the scientific community at the time suspected that species can undergo changes and descend from more primitive forms, few were willing to challenge the dogma that species were created separately and hence immutable. It was left to a young English naturalist in the mid-19<sup>th</sup> century named Charles Darwin to adduce evidence from geological and biological artifacts in order to advance his famous theory of evolution and natural selection.

**From Medical School Dropout to Naturalist:** Born on February 12, 1809 in Shrewsbury, England, Charles Darwin was the fifth of six children of Robert Darwin, a country physician, and Susannah Wedgwood. His grandfather was Erasmus Darwin, a physician, inventor and poet who was himself interested in evolution. As if anticipating his eventual career, Darwin as a child collected and categorised coins, minerals, stamps and pebbles. At the age of 16 years, he left for Edinburgh to study medicine, but was so repelled by the sight of surgical procedures without anaesthesia that he quit after two years.

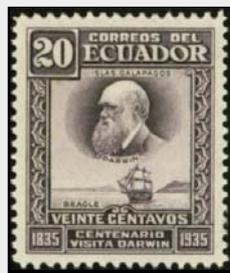
Darwin next enrolled at Christ's College at Cambridge to become a country clergyman. There, he developed a passion for collecting beetles, and had the good fortune to meet Professor John Stevens Henslow, a renowned naturalist. Darwin was able to go on a geological expedition to North Wales with geologist Adam Sedgwick and so developed expertise in glacial and rock dating.

Not long after Darwin graduated from Cambridge, Professor Henslow recruited him to join the expedition of *H.M.S. Beagle*, a survey ship that belonged to the British Royal Navy. The voyage was intended to be

a three-year survey of the coast of South America, Cape Verde, New Zealand, Australia and the Galápagos Archipelago. The *Beagle* set sail on December 27, 1831, and during this historic voyage, Darwin observed and recorded changes in geologic strata and natural inhabitants. He blindly collected fossil bones, plants and flowers without any purposeful design. Most notably, he observed and recorded his studies of the incredible fauna that included rare birds (finches, mockingbirds and blue-footed boobies), iguanas, green sea turtles and other species in the Galápagos, a group of islands off the coast of Ecuador.

As with most naturalists, Darwin believed in the immutability or separateness of species. He embraced the notion of *catastrophism*, which dates current geological features to "sudden, powerful or violent events," much like the Biblical Flood. At the same time, Darwin was aware of the writings of French naturalist Jean Baptiste Lamarck, who had postulated that all species including man are descended from other species. He had also read about *uniformitarianism* in Charles Lyell's book, *Principles of Geology*, which concluded that geological changes are gradual (phenomenon of gradualism) rather than precipitous.

During his expedition, Darwin noted the undulating topography along the South American coasts, and this made him more receptive towards gradualism. Upon his return to England, he retrospectively analysed the collected specimens and recorded observations, and immediately recognised the similarities of existing animals to the fossils of extinct ones. Although he had tentatively concluded that transmutation was a natural phenomenon, he was unsure how one species may change to form a new one. In 1838, he arrived at the idea of natural selection after reading Thomas Malthus' *An Essay on the Principles of Population*. The essay was about human struggles in society, but it suggested to Darwin that under the competitive conditions of animal



and plant life, “favorable variations would tend to be preserved and unfavourable ones to be destroyed [through decreased chance of survival].” Darwin had stumbled on the natural law of the survival of the fittest, or more accurately, survival of the most adaptable, that inexorably predicts natural selection. Interestingly, Alfred Russell Wallace, another British naturalist, had independently arrived at the same theory, also after reading Malthus’ essay.

Darwin published *On the Origin of Species by Means of Natural Selection* in 1859, and expanded his evolution theory to man in his 1871 book, *The Descent of Man*. Initially ignored, *The Origin of Species* was eventually recognised as an important contribution, and in 1864, Darwin received the Copley Medal of the Royal Society, the highest science award in England.

**Evolution versus Creation:** Darwin’s ideas elicited fierce opposition from older naturalists including his mentor Adam Sedgwick, who deemed the theory a blasphemy. Many condemned Darwin for the outrage that “*the Ape was our Adam*.” His harshest opponent was the Bishop of Oxford, Samuel Wilberforce, who declared that his theory of evolution was “*absolutely incompatible not only with the revealed word of God but also with his works and spirit: man’s supremacy on earth, his gift for speech and reason . . .*” During a notorious public debate over Darwin’s theory, Bishop Wilberforce asked Thomas Huxley, Darwin’s strongest advocate, “*on which side of his family he claimed to be descended from an ape*,” upon which Huxley replied that he “*would rather be descended from an ape than from a cultivated man who used his gifts of culture and eloquence in the service of prejudice and falsehood*.”

Prior to the theory of evolution, public schools widely taught the biblical account of creation. However, as the theory gained popularity in the early 20<sup>th</sup> century, it became increasingly incorporated into school curricula, but its teaching in public education continued to be challenged. For example, the Tennessee Anti-Evolution Act of 1925 prohibited the teaching of evolution in public schools, and in the infamous Scopes Monkey Trial, the Tennessee Supreme Court found schoolteacher John T. Scopes guilty of breaking the law, but the case was thrown out on a technicality. In the 1968 case of *Epperson v. Arkansas*, the United States Supreme Court held that “*the Arkansas statutes forbidding the teaching of evolution in public schools and in colleges and universities supported in whole or in part by public funds are contrary to the freedom of religion mandate of the First Amendment and in violation of the Fourteenth Amendment*.”

Yet the controversy is far from over. As late as 2001, various jurisdictions such as Georgia, Washington, Louisiana, and West Virginia were proposing legislation to outlaw the teaching of evolution in high school biology courses.

The majority of scientists accept Darwin’s theory of evolution, but the general public is more skeptical, with only a third believing that evolution is well supported by the evidence. For one thing, Darwin’s use of gradualism to describe evolutionary changes fails to explain the abrupt appearances of new species in fossil records without evidence of an intermediary species. In 1972, two paleontologists, Niles Eldredge and Stephen Jay Gould, directly challenged Darwin by proposing that speciation occurs by abrupt changes followed by extended periods of stasis, a theory termed *punctuated equilibrium*, which is closely aligned with *catastrophism*. However, the greatest enigma about Darwin’s theory on the origin of man remains the missing link between ape and man, a topic hotly debated notwithstanding the discovery of “Java man,” or *Pithecanthropus erectus*, the purported missing link, by Eugene Dubois in 1891.

**Agoraphobia:** In 1839, at the age of 30 years, Charles Darwin married his cousin Emma Wedgwood, with whom he had 12 children. For most of the next 43 years, he lived a secluded, quiet life with his family in the countryside in Downe, Kent. Throughout much of his life, Darwin was ill with undiagnosed complaints of nausea, vomiting, abdominal pain, diarrhoea, multiple allergies, palpitations and anxiety. Diagnostic speculations abound, and these include Chaga’s disease, arsenic poisoning, neurasthenia, depression and hypochondriasis. A recent theory attributes Darwin’s bouts of gastrointestinal symptoms to lactose intolerance, but the most accepted diagnosis appears to be panic disorder with agoraphobia (abnormal fear of being in public places). This theory would nicely explain his recurrent palpitations, dizziness, shortness of breath and abdominal distress, as well as emotional symptoms like trembling, crying and difficulty with public speaking and group meetings.

Charles Darwin died in 1882 at the age of 73 years. History’s greatest naturalist was a medical school dropout, but he managed to garner three honorary MD degrees for his achievements, and earned a burial place in Westminster Abbey.

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