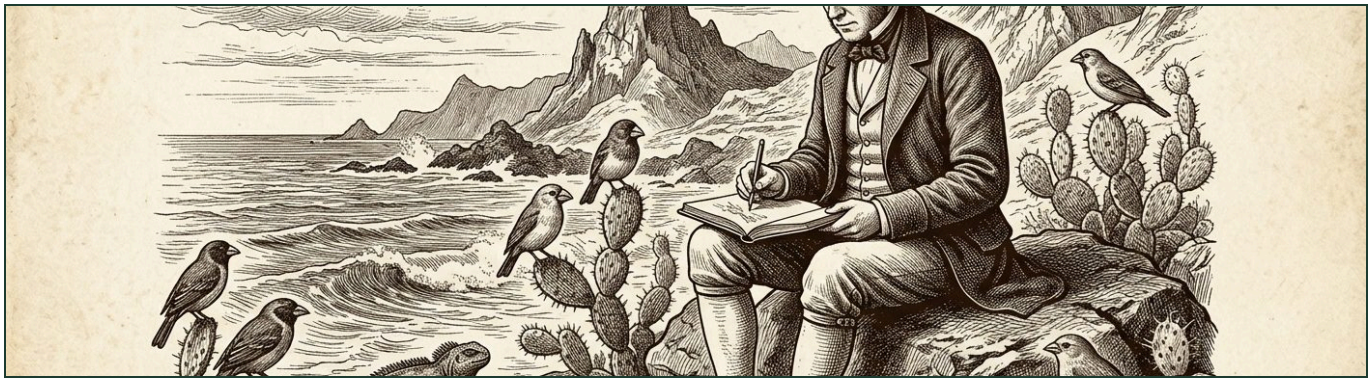


1831 – 2003

Evolution & Natural Selection Timeline

The theory of evolution by natural selection — developed by Charles Darwin in the 19th century and confirmed at the molecular level in the 20th — is the central organizing theory of all biology, explaining how all living things are related and how species change over time.

1831–36

Darwin's Voyage on the Beagle

Charles Darwin, aged 22, joins the HMS Beagle as a naturalist on a five-year voyage around the world — collecting thousands of specimens and observing subtle variations in animals across different locations, including the famous finches of the Galápagos Islands.

> **Why it mattered:** *The Beagle voyage gave Darwin the raw evidence for evolution — diverse organisms on isolated islands, fossil mammals resembling living species, and small variations between populations across short distances — all pointing toward species changing over time in response to local conditions.*

1844–58

Darwin Develops His Theory

Darwin writes out his theory of natural selection fully in 1844 but holds back from publishing for fifteen more years — aware of the controversy it will cause — while quietly gathering more evidence and corresponding with scientists around the world.

> **Why it mattered:** *Darwin's 15-year delay shows how carefully he built his case; it also led to one of science's great near-misses — when Alfred Russel Wallace independently arrived at the same theory in 1858 and wrote to Darwin, Darwin was finally pushed to publish.*

Evolution & Natural Selection Timeline *continued*

1858

Wallace and Darwin Present Natural Selection

Alfred Russel Wallace, working in the Malay Archipelago, independently develops the same theory as Darwin; their ideas are jointly presented to the Linnean Society in London on July 1, 1858 — the formal birth of the theory of evolution by natural selection.

> **Why it mattered:** *The joint presentation is one of science's great moments of coincidence — two scientists on opposite sides of the world arriving at the same revolutionary idea independently — and ensured that both men received historical credit for the discovery.*

1859

On the Origin of Species Published

Darwin publishes On the Origin of Species, laying out the evidence for evolution by natural selection in exhaustive detail — the first edition of 1,250 copies sells out on the day of publication, November 24, 1859.

> **Why it mattered:** *Origin of Species is one of the most important books ever written — within a decade, most scientists accepted the fact of evolution; it gave biology a single unifying principle that explains the diversity of all life on Earth and remains the foundation of modern biology.*

1865–66

Mendel Discovers the Rules of Inheritance

Gregor Mendel, an Augustinian friar in what is now the Czech Republic, presents and publishes the results of his experiments breeding pea plants — discovering that traits are passed down in predictable ratios through discrete units (what we now call genes).

> **Why it mattered:** *Mendel discovered what Darwin lacked: a mechanism for inheritance. Darwin knew natural selection worked but couldn't explain exactly how traits were passed from parents to offspring; Mendel's genetics provided the missing answer — though his work went unnoticed for 35 years.*

1900

Mendel's Work Rediscovered

Three European scientists independently rediscover Mendel's forgotten 1865 papers; his laws of genetics are quickly recognized as the explanation for how inherited variation — the raw material of natural selection — is transmitted between generations.

> **Why it mattered:** *The rediscovery of Mendel was the moment evolution and genetics merged — it launched the Modern Synthesis of the 20th century, which unified Darwin's natural selection with Mendelian genetics into the robust framework that underpins all modern biology.*

1925

The Scopes Trial

Tennessee teacher John Scopes is tried for teaching evolution in violation of a state law banning it; the 'Scopes Monkey Trial' becomes a national sensation, pitting attorney Clarence Darrow against former presidential candidate William Jennings Bryan in a debate followed across the country.

> **Why it mattered:** *The Scopes Trial showed that evolution was not just a scientific question but a cultural flashpoint — it put the teaching of evolution at the center of the American debate about science, religion, and public education, a debate that continues in school boards and courts today.*

1953

Watson, Crick, and Franklin Discover DNA's Structure

James Watson and Francis Crick, building critically on X-ray crystallography data produced by Rosalind Franklin, discover that DNA is a double helix — two strands wound around each other, explaining exactly how genetic information is stored and copied during cell division.

> **Why it mattered:** *The double helix explained evolution at the molecular level — the heritable information that Mendel studied as abstract units was now a physical molecule that could be read, copied, mutated, and compared across species; it launched molecular biology and the era of genetic medicine.*

1972

Punctuated Equilibrium Proposed

Stephen Jay Gould and Niles Eldredge propose punctuated equilibrium — the idea that evolution happens in bursts of relatively rapid change separated by long periods of stability — based on patterns they observe in the fossil record.

> **Why it mattered:** *Punctuated equilibrium was a productive refinement of Darwin's original model, sparking debate about the pace of evolution and showing that the theory of evolution continues to grow and improve — scientists debate HOW evolution works even as the fact that it occurs is entirely settled.*

2003

Human Genome Project Completed

The Human Genome Project completes the first full sequence of human DNA — three billion base pairs — providing the reference genome that allowed scientists to later confirm humans share roughly 98-99% of their DNA with chimpanzees, and revealing the molecular blueprint shared by all human beings.

> **Why it mattered:** *The Human Genome Project gave evolution its fullest molecular confirmation — the patterns of similarity and difference in DNA across species match exactly what evolution predicts, provided tools for personalized medicine and disease research, and connected every living human being through a shared genetic heritage.*