<http://www.xtimeline.com/timeline/Timeline-of-Biological-Discoveries>

1910 Thomas Hunt Morgan: Gene theory of inheritance

1912 Funk suggests the name "vitamin"

1913 Discovery of vitamin A

1915 Friedrick Twort describes bacteriophage

1915 Yamagiwa adn Ichikawa discover chemical carcinogens

1916 Calvin Bridges provides experimental proof for Sutton's hypothesis of 1902

1920 Banting and Best isolate insulin

1924 Australopithecus africanus

1925 Scopes trial

1926 Chromosome inversions predicted by C.B. Bridges

1927 H.J. Muller induces mutations with X-rays

1928 Alexander Flemming's discovery of penicillin

1929 Zondek and Ascheim discover estrogen

1930 R.A. Fisher and S. Wright provide mathematical foundations for population genetics

1932 Kroll and Ruska: first electron microscope

1932 Gerhard Domagk: sulfanilamide

1933 Thadeus Reichstein synthesizes ascorbic acid

1935 Wendell Stanley prepares virus in crystalline form

1935 Fritz Zernicke: first phase contrast microscope

1940 Rene Dubos discovers gramicidin & tyrocidin

1940 The Krebs Cycle

1941 Beadle and Tatum: One-gene, one-enzyme hypothesis

1944 Avery, McLeod, and McCarty show that DNA controls heredity effects

1946 Genetic recombination demonstrated

1914-Charles Doolittle Walcott identifies fossil bacteria in *Cryptozoon*-like structures (stromatolites).

1915-Calvin Bridges identifies strains of mutant fruit flies with extra pairs of wings. Decades later, these strains will help biologists understand Hox genes that control the head-to-toe anatomy of widely varying animals.

1916-Two duckbill dinosaur fossils, with extremely rare skin impressions, sink to the bottom of the Atlantic when a German warship fires on the vessel carrying them.

1924-1934-British biochemist J.B.S. Haldane publishes 10 mathematical papers arguing that natural selection of genetic variations, as described by Mendel, can enable populations to adapt to change.

1925-Tennessee schoolteacher John Thomas Scopes is tried for teaching evolution in the famous "Scopes Monkey Trial." Two-time presidential candidate William Jennings Bryan leads the prosecution. Labor lawyer Clarence Darrow leads the defense and goads Bryan into declaring that humans are not mammals. The conviction will be overturned on a technicality, and the anti-evolution law will remain on the books for decades.

1942-Ernst Mayr publishes *Systematics and the Origin of Species*, and Julian Huxley publishes *Evolution: The Modern Synthesis*. Both books are significant contributions to the neo darwinian synthesis combining elements of natural selection, genetics, mutation, population biology and paleontology.

1943-Oswald Avery, Colin MacLeod and Maclyn McCarty submit a paper for publication in the *Journal of Experimental Medicine* describing nucleic acid DNA as the carrier of genetic messages.

1944-Theoretical physicist Erwin Schrödinger publishes *What is Life?* arguing that living organisms store and pass along information, perhaps using something like Morse code. This book will inspire James Watson, Francis Crick and Maurice Wilkins, who will share the Nobel prize for discovering the structure of DNA.

1910-11 The chromosome theory of heredity is confirmed in studies of fly eye color inheritance by T.H. Morgan and colleagues.

1913 First ever linkage map created by Columbia undergraduate Alfred Sturtevant (working with T.H. Morgan).

1910's-30's The eugenics movement is popular, fueling racist sentiment and leading to involuntary sterilization laws.

1925-27 H. Muller shows that X-rays induce mutations in a dose-dependent fashion.

1928 Some component of heat-killed virulent bacteria can "transform" a non-virulent
strain to become virulent, as shown by Fred Griffith. This sets the stage for work done in 1944.

1931 Genetic recombination is caused by a physical exchange of chromosomal pieces, as shown in corn by Harriet Creighton and [Barbara McClintock](http://profiles.nlm.nih.gov/LL/).

1941 One gene encodes one protein, as described by Beadle and Tatum.

1944 DNA is the molecule that mediates heredity, [as shown in Pneumococcus transformation experiments by Avery, MacLeod, and McCarty.](http://profiles.nlm.nih.gov/CC/Views/Exhibit/documents/discovery.html) Most people were skeptical of these findings until 1952.

1946 Genetic material can be transferred laterally between bacterial cells, as shown by [Lederberg](http://profiles.nlm.nih.gov/BB/) and Tatum.

1913 - Alfred Henry Sturtevant (1891-1970) began constructing a chromosome map for Drosophelia (it was completed in 1951 for all four Drosophelia chromosomes).

1919 - Hermann Joseph Muller (1890-1976) of the U.S. experimented with Drosophelia to create more mutant flies.

1941 - George W. Beadle (1903-1989) of the U.S. and Edward L. Tatum (1909-1975) of the U.S. discovered that genes control the production of enzymes.

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|  | 1944 - Oswald T. Avery (1877-1955) of the U.S. announced that DNA alone is the substance responsible for heredity. |

1911 - Thomas Hunt Morgan proposes that genes are arranged in a line on the chromosomes.

1920 - Nikolay Vavilov establishes the Earth’s biomes

1927 - Austrian zoologist Karl von Frisch publishes *Dancing Bees*.

1928 - Alexander Fleming discovers penicillin.

1928 - Frederic Clements proposes the theory of plant succession.

1929 - Phoebus Levene discovers the sugar deoxyribose in nucleic acids.

1933 - Tadeus Reichstein artificially synthesizes vitamin C; first vitamin synthesis.

1937 - Konrad Lorenz describes the imprinting behavior of young birds.

1944 - Oswald Avery shows that DNA carries the genetic code in pneumococcus bacteria.

1946 - American chemist Melvin Calvin explains photosynthesis.

1949 – Aldo Leopold’s book *A Sand County Almanac* becomes the inspiration for the environmental movement