

Theory of evolution

creationists

religious belief vs. scientific theory

Charles Darwin

Alfred Wallace

George Louis Leclerc, Comte de Buffon,

Erasmus Darwin

Jean Baptiste, Chevalier of Lamarck.

inheritance of acquired characteristics/ "use-disuse" theory

George Cuvier

theory of catastrophism.

Charles Lyell

uniformitarianism

Charles Darwin, naturalist, British Navy's H.M.S. Beagle mapping expedition (1831-1836).

Galápagos Islands finches

adaptive radiation

"descent with modification".

Thomas Malthus, 1798

peppered" moths

On the Origin of Species, 1859.

The proof of the theory of evolution can be stated as 3 observations and 2 deductions:

Fact 1. There is a natural tendency for organisms to increase in number geometrically. Prefacing this: reproduction must occur (must reproduce).

Fact 2. Despite this tendency to geometrically increase, the number of a given species remains constant.

Deduction 1. In order to exist, there is competition for survival through reproduction and greater fertility.

"Struggle for existence"

Fact 3. Individual members of a population vary in the characters they possess.

Deduction 2. Since there is a struggle for existence and since individuals are not all alike, some variation will be advantageous while other kinds of variation are unfavorable in the struggle. In other words, certain individuals, because of the traits they possess, are more successful in reproducing and surviving.

adaptations

an adaptation: any characteristic that allows an organism to live and reproduce in an environment where it probably could not otherwise exist.

Definition: "Natural selection is a mechanism for evolutionary change favoring the survival and reproduction of some organisms over others because of their biological characteristics".

opportunistic

orthogenesis

irreversible.

orthoselection

extinction

Evidence of Evolution

1. fossil record of change in earlier species
2. chemical and structural similarities of related life forms
3. recorded genetic changes in living organisms over many generations
4. geographic distribution of related species

Punctuated Equilibrium

Stephen Jay Gould and Niles Eldredge