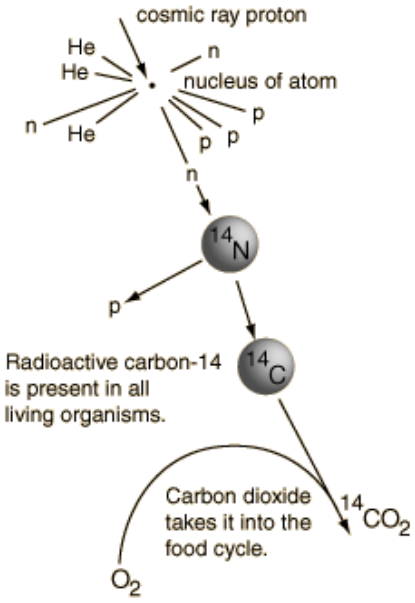
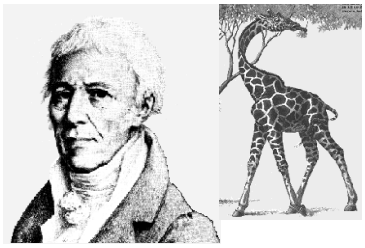
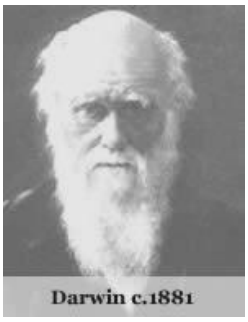
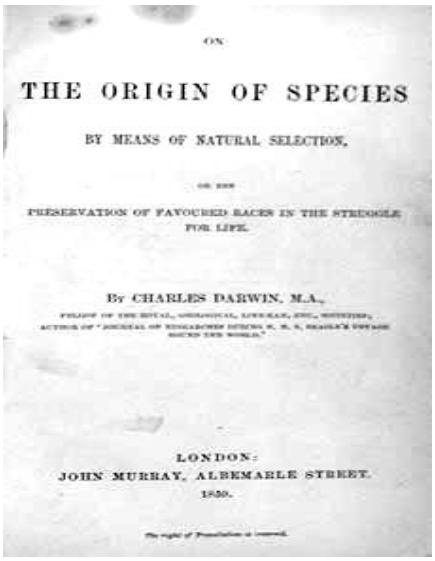





Darwin c.1881


ON
THE ORIGIN OF SPECIES
BY MEANS OF NATURAL SELECTION,
PRESERVATION OF FAVOURED RACES IN THE STRUGGLE FOR LIFE.
By CHARLES DARWIN, M.A.,
LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1859.

Evolution

I. Change over time

II. Evidences that support the theory of evolution

A. Fossils are the hard part of organisms preserved or impressions left behind
   1. Fossils are the hard part of organisms preserved or impressions left behind
      a. Lower layers are the oldest
      b. Upper layers are most recent
         1) Radio Active Dating
         2) Carbon 14 which changes to energy with a half life of 5730 years
         3) Other radio active dating

B. Fossil Record interpretation
   1. interpreting where other organisms fit into the life history on earth

C. Comparative anatomy
   1. Similarity of anatomy structures (homologous structures)
   2. Vestiges, structures not currently used

D. Comparative embryos
   1. Similarity of embryos in development
   2. Ontogeny recapitulates phylogeny

E. Comparative biochemistry
   1. Similarity of DNA make up point to a common ancestry

F. Genetics and selective breeding point to survival of the fittest

G. Micro evolution proves the overall theory of evolution
   1. Bacteria and Penicillin
   2. Peppered moth in Europe

III. Early evolutionist and their theories

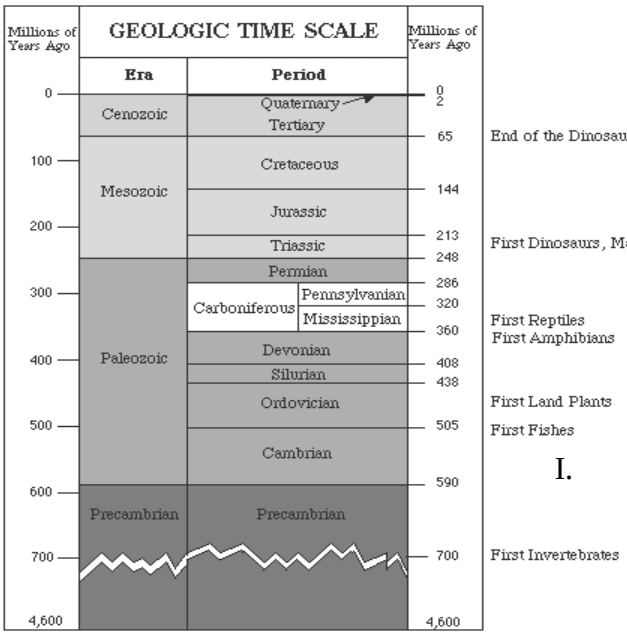
A. John Baptist Lamark 1809
   1. Theory of use and disuse
   2. This theory is not accepted at all but provided a framework for thinking about evolution

B. Charles Darwin - Father of modern evolutionary theory
   1. At age 22 set sail on the ship HMS Beagle in 1831
   2. Darwin's theory developed from what he observed on the trip
   3. The Galapagos Island animals caused Darwin to further question how so many species could exist
   4. Darwin theorized that things were not independently created but evolved by natural selection
   5. Darwin Wrote a book, On the Origin of Species, by Means of Natural Selection
   6. Natural Selection is a struggle to survive and those best equipped to survive will pass on their genetics
      a. External forces that cause natural Selection
         1) Over population
         2) Competition, or lack of competition
         3) Reproductive isolation
         4) Geographic isolation
         5) Speciation

b. Four factors that govern how organisms evolve by natural selection (six in the text book)
    1) More offspring are produced than can survive
    2) There is variation among offspring
    3) Those organisms with variation more suited for their environment will survive and produce more offspring
    4) The resulting population will change and become more like those who are best suited for the environment

IV. The origin of life according to those who believe that life begin from nonliving and slowly evolved into the species of to day

A. Life began evolving about 4 billion years ago
    1. Prebiotic soup hypothesis (Oparin Hypothesis)
        a. An atmosphere of methane, ammonia, hydrogen, water vapor exixted in the early environment
        b. Energy from lighting caused amino acids to form, and eventually DNA and life formed
    2. Stanley Miller used UV light, electricity and prebiotic soup chemical and caused a tar substance to form on the flask.
        a. Turned to be simple amino acids
        b. However no amount of coaxing could cause the amino acids to develop further
        c. The early atmosphere could not have had oxygen or all compounds necessary for life would be destroyed
        d. Page 327 Figure shows how many evolutionist believe life evolved
        e. Page 328 puts animals in groups of animals into what evolution believes the scheme in which they should fit



Adaptation and Speciation

I. Adaptation – an inherited trait or set of traits that aids the chances of survival.

A. Origin of Adaptations
    1. Variation
        a. The results of genetic variety
        b. Also mutations that have taken place through the years
        c. It is thought that complex adaptations would require much time

B. Types of adaptations
    1. Morphological adaptations – changes in the anatomy of the organism
        a. Any change in the way the organism looks
        b. Coloration -
            1) Cryptic coloration – blending with environment
            2) Warning coloration – colors that pronounce rather than hide the organism
            3) Mimicry – deceptive (looks like another animal)

2. Physiological adaptations – metabolic or chemical changes within the organism
3. Behavioral adaptations – Things that an organism does that could help them better survive
    a. Mating rituals
    b. Migratory habits

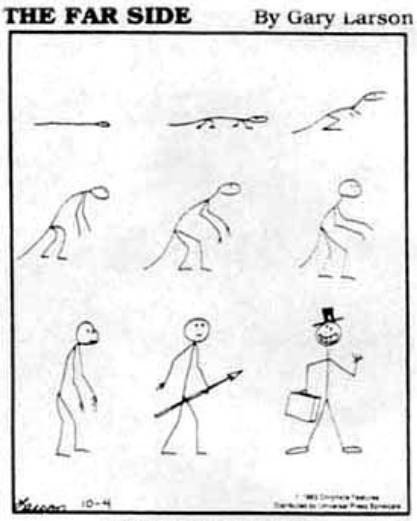
II. Speciation – is any change normal breeding group of organisms so that they quit interbreeding with another group

A. Reasons for speciation
1. Geographic isolation
2. Reproductive isolation
3. Speciation

B. Adaptive radiation – when many species evolve from a common ancestor
1. An example could be the Galapagos finches
    a. Species evolve to fill the geological niche

C. Convergent evolution – refers to a possible evolution where organisms that are completely different have acquire characteristic that are the same
1. A bat and a bird

D. Divergent evolution – is the idea that species with much the same origin acquire characteristics that are completely different
1. The Galapagos finches



Evolution of the Stickman.

III. Gradualism Vs Punctuated Evolution (equilibrium)

A. Gradualism – is the idea that evolution was a slow gradual process of billions of years

B. Punctuated – is the idea that evolution went in jumps of change over a period of billions of years

C. The most widely accepted theory combines both of these theories

IV. Human Evolution

A. Evolutionist believe that men originated in Africa

B. Evolutionist believe that man came from ape like origon
1. *Autralopithecus*
2. *Homo habilis*
3. *Homo erectus*
4. Neanderthals
5. Cromagnon
6. Modern man *Homo sapiens*

Evolution	Design
All living things came from the same ancestor that arose from a pre-biotic soup	All life was designed by an intelligent designer. Life was not just a chance of the right material in the right environment
Comparative anatomy with comparative structures points to a common ancestor	Anatomy and physiology with common characteristics point to one designer or an original design plan
Evolution observed and selective breeding support the theory of evolution explaining all organisms on one family tree	Evolution observed is the designed ability in the DNA to conserve life in an ever changing environment
The lack of geological intermediates point to punctuated evolution caused by catastrophic events and mass extinction	The lack of geological intermediates point to a designer and changes that can be documented demonstrates the designed ability to adapt