

Major Events in Biology

Pre-Darwinian Biology Keywords

Ages of sand: Douglas Adams, author of “The Hitchhikers’ Guide to the Galaxy, divided Earth’s history in accordance to the use of sand in scientific innovation. There exist four periods of time: The first involves glass and its role in constellation and planetary observation. The second division is defined by the glass lense that is the microscope. It grasps in detail forms and functions of organisms. The silica chip in the third period raises the mathematical model aspect of the natural sciences to unprecedented levels. Fiber optics conclude the four ages, and allow scientists from all over the world to exchange information and exercise peer to peer review.

Al-Dinawari: Islamic botanist that catalogued plants at the dawn of the Muslim golden age. Alongside his plant collection, he described plant reproduction and growth. His greatest contribution is his “Book of Plants” which labeled him the father of Arabic botany. Of the six volumes, only the third and fifth survive today.

Alhazen: The first to have brought forth the scientific method. In this, he described a true scientist as being somebody who questions the information before him and doesn’t confide in what has been previously found. Additionally, he is somebody that treats all that he reads as an enemy, and “attacks it from all sides”. Alhazen’s passion for the natural sciences grew from the belief that understanding it would bring him closer to God.

Folk Taxonomy: Classification is set by word of mouth as it’s passed from one generation to another. The degree to which it’s subdivided varies from one culture to the next. For example, North America treasures automobiles, therefore there are a variety of brands and models. Moreover, the Eskimos and Inuits have 30 names for snow. In regards to similarity, there’s a limit to the amount of unique components of a classification. This number approximates 500.

Great Chain of Being: Organized throughout the years by Greek philosophers and expanded in the the Middle Ages, the Great Chain of Being classifies specimens through their complexity and structure. A combination of existence + life + will + reason + immortality + omniscient, omnipotent determines ranking. Also called the *scala naturae*, the gods occupy the highest level, and humans are somewhere beneath. The nonliving world stands at the bottom, and every other living thing fills the in between.

Harvey: This English physician is known as the father of physiology. He was the first to describe the process of blood flow, and how it’s pumped from the heart. In 72 pages, Harvey accounted the circulation of blood in his book, *De Motu Cordis*.

Hierarchical system: A system of organization containing categories within larger categories. At a time when the natural sciences were behind in innovations, Linnaeus came up with a hierarchical system to form taxonomic groups. In addition to this, he used this system to categorize plants and animals in his *System naturae*.

Hippocrates: One of the first individuals to contribute to the understanding of the living world. A Greek philosopher who specialized in the area of medicine and human biology. The *Hippocratic Corpus*, one of his greater works, contained approximately 70 medical texts.

Historical narrative: A component to the experimental method used by biologists today. It follows inductive reasoning since it creates a general path to be later specified. Prior to the scientific revolution, scientists made observations and used historical narratives as explanations. After the scientific revolution, narratives were replaced with experiments.

Hypothesis: Often mistaken with the term theory, it is a component to the theory. It's obtained through observation and research, and through this comes an explanation, otherwise known as a hypothesis. Approved hypotheses are ones that can be tested.

Ibn al-Baitar: A pharmacist, botanist, physician, and scientist that contributed to the Islamic scientific movement. He recorded 300-400 types of medicine which he gathered from other Islamic physicians. Travelling from Africa to Anatolia, he collected plants to which he later added to his book, "Compendium on Simple Medicaments and Food".

Induction: A scientific method in which one observes many events and draws a pattern from it all. It is to take the specific and form a general. It's the complete opposite of the deductive approach, which takes the general and forms a specific.

Industrial melanism: The dark colour of animals acquired through the soot-covered environment in the industrial age. This change in characteristic also hints at the increased probability that the animal will survive, since they become less visible to predators. The case of the peppered moths is a common demonstration of this.

Van Leeuwenhoek: The father of microbiology and an early developer of the microscope. He used glass spheres as the lenses to his microscopes. The smaller the sphere, the greater the magnification. Apart from this, he regularly corresponded to the Royal Society of London to report his findings in the field of microbiology. The legitimacy of his work was later questioned by the society when he discovered single-celled organisms.

Vesalius: A Brabantian anatomist and physician that made significant progression in the field of human anatomy. His book *De humani corporis fabrica*, is one of the most significant on the subject of anatomy. In a time when his area of study was disregarded, Vesalius performed numerous dissections to correct ancient thoughts. Later on, he left his research to focus on medicine, and was appointed physician of the imperial court of Emperor Charles V.

Vitalists: Those who indoctrinate the thought that the living is separate from the nonliving. The differentiating characteristic is what has been anciently coined as "essence". This essence can be further explained as the inexplicable force that lies within the the biotic that the abiotic don't possess.

Lamarck (Jean- Baptiste) :

- Transmutation of species (change of species)
- The environment changes the organism and that same organism passes down those trait to their off-springs
- Germ Cells - are not used to create change (somatic cells)

Leclerc (George-Louis Buffon):

- He found the common groups of animals
- Bio-Geography
- All organisms on the planet were in the same region and later migrated (an abiotic change of the essence of the animals)

Linnaean taxonomy :

- Mechanical taxonomy (looking for patterns)
- Kingdoms (Kingdom, Phylum, Class, Order, family, Genus, Species)
- Binomen (use italic and genus is capitalized)

Linnaeus (Carolus):

- The hierarchy System
- He established Kingdoms (Kingdom, Phylum, Class, Order, family, Genus, Species)
- No more crazy descriptions of each animal , just two word names for different species

Law:

- Is universal (can apply anywhere)
- An equation to explain an experiment
- Mendel's Laws: The math behind the shuffling (pairing) of the punnett square

Logical Prediction :

- The gathering of facts that already exist to make an accurate guess

Mechanical taxonomy :

- Looking for patterns
- Arranging organisms into inclusive categories
- Domain , Kingdom, Phylum, class, Order, Family, Genus, Species

Middle Ages:

- Early (middle ages): Goths invade
- High (middle ages) : Europe builds itself back
- Late (middle ages) : Black plague
- Black Plague : Deadly flea bite (Ring around the rosy)

Natural Sciences:

- Not universal

- Induction: from specific to general (an animal that is an insect has wings = all insects have wings)
- Based on historical narratives