Evolution and Behavior

Charles Darwin (1809-1882)

Published *Origin of Species* (1859), proposing the theory of evolution by natural selection.

Historical Context

- Most believed in the fixity of species
- Species had been created in their present forms only a few thousand years ago.
- Species do not evolve.
- The French naturalist Lamark had proposed a theory of evolution through the inheritance of acquired characteristics.
**Lamarkian Evolution**

- Changes take place in an organism’s structure during its lifetime through use or disuse.
- These changes are somehow transmitted to the organism’s offspring.
- Example: Weightlifter’s children would have stronger than average muscles.

**Darwin’s Theory of Evolution**

- Based on three principles:
  - Variation – members of a species are not identical to one another.
  - Natural Selection – in a given environment, individuals with certain characteristics tend to survive better than others and produce more surviving offspring.
  - Like Begets Like – offspring resemble their parents.

**Darwin Versus Lamark**

- Darwin did not reject Lamarkian inheritance, but thought that it played a minor role in evolution.
- Darwin did not know the mechanisms for “like begets like” and variation: genes and genetic mutation.
- We know of no way that acquired characteristics could be inherited via the genes.
Evolution and Final Causation

- Darwin’s theory explains Aristotle’s “final causation”:
- Needed characteristics do not work backward in time to produce their causes.
- Instead, characteristics appear through mutation, and those that prove adaptive in a given environment are selectively retained. Result – organism’s characteristics have purposes or functions.

Evolution and Behavior

- Darwin’s theory explains how new structures appear that serve particular functions in the life of the organism.
- But it also explains the origin of instincts and their evolution.
- Of course, instincts per se do not evolve.
- Instead, organisms inherit structures, such as brains, in which instincts are “hard-wired”.

Natural Selection at Work
Implications

- Animal instincts can be explained by a process of blind variation and natural selection. There is no need to invoke magical processes.
- We and other animals share a common ancestry and therefore may share many characteristics. Studying animal behavior may disclose principles that apply with equal force to ourselves.