Chapter 1: Variation Under Domestication

Species: A group of organisms that can interbreed and produce fertile offspring.

Varieties: Subdivisions within species, showing minor differences.

Natural Selection: The process where organisms better adapted to their environment tend to survive and produce more offspring.

Adaptation: A trait shaped by natural selection, aiding survival.

Domestication: The process of taming and breeding animals or plants for human use.

Heritable Traits: Characteristics passed from parents to offspring through genes.

Artificial Selection: The intentional breeding of organisms to promote desirable traits.

Struggle for Existence: The competition among organisms for limited resources.

Chapter 2: Variation Under Nature

Variation Under Nature: Differences found among organisms of the same species in their natural environment.

Organisms: Individual living entities, including plants, animals, and microorganisms.

Morphology: The study of the form and structure of organisms.

Taxonomy: The science of classifying organisms into groups based on shared characteristics.

Intermediate Forms: Organisms that exhibit traits bridging gaps between distinct species.

Speciation: The evolutionary process by which new species arise.

Geographic Distribution: The natural arrangement of organisms across the planet.

Ecological Niche: The role and position a species occupies in its environment.

Chapter 3: Struggle for Existence

Struggle for Existence: The competition among organisms for limited resources necessary for survival.

Population Pressure: The effect of increasing population density on resource availability.

Overproduction of Offspring: The tendency of species to produce more offspring than can survive.

Competition: The rivalry between organisms for resources, mates, and space.

Predation: The act of one organism hunting and consuming another for sustenance.

Environmental Constraints: Natural limits placed on population growth and survival by ecological conditions.

Extinction: The complete disappearance of a species from the environment.

Balance of Nature: The dynamic equilibrium between species populations and resources.

Chapter 4: Natural Selection

Natural Selection: The process where organisms with advantageous traits survive and reproduce more successfully.

Variation: Differences among individuals within a species that may impact survival.

Fitness: The ability of an organism to survive and reproduce in its environment.

Survival of the Fittest: A phrase describing the outcome of natural selection, where the most adaptable organisms thrive.

Selective Pressure: Environmental factors that influence which traits are advantageous.

Inheritance: The transmission of traits from parents to offspring.

Favorable Variations: Traits that provide an advantage in survival or reproduction.

Speciation: The formation of new and distinct species through evolutionary processes.

Divergence of Character: The tendency for populations to become more distinct over time due to selection pressures.

Extinction: The loss of species as they fail to adapt to changing conditions.

Chapter 5: Laws of Variation

Laws of Variation: The principles governing how traits change and develop in organisms.

Correlation of Growth: The interdependence of different traits within an organism during development.

Use and Disuse: The idea that frequently used traits become stronger, while unused traits diminish over generations.

Inheritance: The passing of traits from parents to offspring.

Environmental Influence: The impact of external factors on the development and variation of traits.

Spontaneous Variation: Random, unpredictable changes in traits within a population.

Adaptive Traits: Characteristics that enhance survival and reproductive success in specific environments.

Reversion: The reappearance of ancestral traits in an organism.

Homology: Similarity in structure or genes due to shared ancestry.

Atavism: The re-emergence of ancestral traits that have been dormant for generations.

Chapter 6: Difficulties on Theory

Difficulties of the Theory: Challenges and objections to the theory of natural selection.

Transitional Forms: Intermediate species that exhibit traits bridging two distinct groups.

Missing Links: Hypothetical ancestral species that connect modern species with their evolutionary predecessors.

Complex Structures: Features of organisms that require multiple components to function.

Eye Evolution: A specific case often cited to question natural selection due to its complexity.

Instinct: Inherited behaviors that aid survival without requiring learning.

Gradualism: The idea that evolution occurs through small, incremental changes over long periods.

Geological Record: Fossil evidence preserved in rock layers over time.

Imperfect Record: The incomplete nature of fossil evidence, which limits understanding of evolution.

Convergent Evolution: Independent evolution of similar traits in different lineages due to similar selective pressures.

Chapter 7: Instinct

Instinct: Inherited behavior patterns that aid in survival and reproduction.

Social Insects: Insects, such as bees and ants, that live in complex, cooperative colonies.

Sterile Workers: Non-reproductive individuals in a colony that contribute to its survival.

Behavioral Adaptation: Modifications in behavior that improve survival or reproduction.

Hive Construction: The process by which social insects build intricate and functional living spaces.

Altruism: Behaviors that benefit others at a cost to the individual performing them.

Natural Selection: The process by which beneficial traits, including instinctual behaviors, become more common in populations.

Mutual Aid: Cooperative behavior between individuals that provides mutual benefits.

Variation in Instincts: Differences in behavioral patterns among individuals or species.

Evolutionary Flexibility: The capacity for instincts and behaviors to adapt over generations.

Chapter 8: Hybridism

Hybridism: The process of crossbreeding between individuals of different species or varieties.

Fertility: The ability of organisms to reproduce successfully.

Sterility: The inability of hybrids or species to produce offspring.

Crossbreeding: The mating of individuals from different species or populations.

Species Barriers: Biological mechanisms that prevent interbreeding between species.

Reproductive Isolation: The inability of different species to produce viable, fertile offspring.

Hybrid Vigor: The enhanced biological qualities observed in some hybrid organisms.

Genetic Variation: Differences in DNA sequences among individuals, populations, or species.

Natural Selection: The process by which advantageous traits become more common in a population.

Speciation: The formation of new and distinct species through evolutionary processes.

Chapter 9: On the Imperfection of the Geological Record

Geological Record: Historical layers of rock and fossils that provide evidence of Earth's past.

Fossil Evidence: Remains or impressions of organisms preserved in geological formations.

Strata: Layers of rock that represent different time periods in Earth's history.

Extinction Events: Periods when large numbers of species disappeared from the fossil record.

Transitional Fossils: Fossils showing intermediate traits between ancestral and descendant species.

Imperfect Record: The idea that the geological record is incomplete due to various natural processes.

Erosion: The wearing away of rock and fossil evidence by wind, water, or other natural forces.

Sedimentation: The process of depositing material that forms new rock layers.

Geological Time: The vast scale of Earth's history measured in millions or billions of years.

Continuity of Life: The concept that life has persisted and evolved over geological time.

Chapter 10: On the Geological Succession of Organic Beings

Geographical Distribution: The natural arrangement of species across different regions and environments.

Endemic Species: Organisms found only in specific geographic locations.

Biogeography: The study of the distribution of species and ecosystems across the planet.

Islands: Isolated landforms that often host unique species due to geographic separation.

Continental Drift: The movement of Earth's continents over geological time.

Barriers to Dispersal: Physical or environmental obstacles that limit the spread of species.

Migration: The movement of organisms from one location to another, often seasonally.

Adaptation to Environment: Changes in organisms that enhance survival in specific habitats.

Convergent Evolution: Independent evolution of similar traits in species from different regions.

Dispersal Mechanisms: Methods by which species spread to new locations, such as wind, water, or animal carriers.

Chapter 11: Geographical Distribution

Affinities of Species: The evolutionary relationships and connections between species.

Geological Succession: The chronological order of fossils and rock layers, reflecting Earth's history.

Extinction: The disappearance of species due to various natural and evolutionary factors.

Survival of the Fittest: The concept that organisms best suited to their environment are more likely to survive and reproduce.

Morphological Continuity: The gradual changes in form and structure among related species.

Paleontology: The scientific study of fossils to understand past life forms and evolutionary history.

Ancestral Traits: Characteristics inherited from distant ancestors that may appear in multiple species.

Adaptive Radiation: The diversification of a group of organisms into various forms filling different ecological niches.

Transitional Fossils: Fossils showing intermediary traits between ancestral and descendant species.

Phylogenetic Tree: A diagram representing the evolutionary relationships among species.

Chapter 12: Geographical Distribution—Continued

Geographical Distribution: The arrangement of species across different regions and habitats.

Historical Biogeography: The study of how historical events, such as continental drift, have shaped species distribution.

Dispersal: The movement of species to new regions or habitats.

Barriers to Distribution: Physical or ecological factors that limit species movement and spread.

Endemic Species: Species found exclusively in a specific geographic area.

Isolated Ecosystems: Unique environments, such as islands, that host distinct species due to geographic separation.

Adaptive Traits: Characteristics that enable species to thrive in specific environments.

Environmental Pressures: Factors like climate, food availability, and predation that influence species survival.
Convergent Evolution: Independent evolution of similar traits in species from different areas.

Ecological Niches: The specific roles or functions a species fulfills within its environment.

Chapter 13: Mutual Affinities of Organic Beings: Morphology—Embryology—Rudimentary Organs

Classification: The organization of species into groups based on shared characteristics.

Taxonomy: The science of naming, describing, and classifying organisms.

Hierarchical Structure: The arrangement of organisms in a ranked system, such as kingdom, phylum, and species.

Homology: Similar traits in different species due to shared ancestry.

Analogy: Similar traits in species due to similar functions, not common ancestry.

Phylogenetic Tree: A diagram showing evolutionary relationships among species.

Morphology: The study of the form and structure of organisms.

Embryology: The study of the development of embryos, providing insights into evolutionary relationships.

Convergent Evolution: Independent evolution of similar traits in unrelated species due to similar environmental pressures.

Natural Classification: Grouping organisms based on their evolutionary relationships rather than superficial similarities.

Chapter 14: Recapitulation and Conclusion

Recapitulation: A summary or restatement of the main points of the argument.

Unity of Type: The concept that organisms within a group share a fundamental structural framework due to common ancestry.

Divergence of Character: The process by which populations of the same species become increasingly different over time.

Morphological Relationships: Structural similarities among organisms that indicate evolutionary connections.

Embryological Evidence: Observations of developmental stages that provide clues about evolutionary relationships.

Vestigial Structures: Features that have lost their original function but are remnants of ancestral traits.

Natural Selection: The mechanism by which advantageous traits become more common in a population.

Speciation: The formation of new species through evolutionary processes.

Fossil Record: The preserved remains of organisms that provide evidence of evolution over time.

Adaptation: Traits that enhance survival and reproduction in specific environments.