

CHAPTER XIV: RECAPITULATION AND CONCLUSION

The *Origin of Species* as “one long argument”

A) Main objections to natural selection:

- **Complexity** of organs and instincts, products of a superior reason
[observed strange gradations in nature as variations of a process of perfection through struggle for existence, *Natura non facit saltum*]
- **Species ≠ Varieties**, clear separation based on **sterility and fertility**-the first are products of special creation, the second are products of “secondary powers”
[more complex and incidental based on **constitutional differences in the reproductive systems** and **conditions of life**, a continuum between varieties and species]
- **Geographical distribution**, how can species that descent from common parents to have reached such distant and isolated parts of the world?
[ignorant of the different climatal and geological changes, as well as the occasional means of transport, during very long periods of time]
- **Intermediate (missing) links**, where are the intermediate forms that showcase the gradation of species? Why do we not observe them around us? Where are the connecting links between species in the geological record?
[intermediate forms exist in lesser numbers and thus don't modify or improve in such a quick rate-the fossil record is far more incomplete than what geologists suggest]

B) Analysis of natural selection (comparison to artificial selection, what makes it a good explanatory tool-instead of the theory of creation)

analogy-the same rules that apply to artificial selection apply to natural selection

Arguments **in favor** of the theory:

- If species are just well marked varieties, the **same laws** that have produced the latter must have also produced the former
- Dominant species with large populations tend to produce many varieties (**diversion of character**)-explanation for the arrangement of all the forms of life
- **Variety-no innovation**, slight modifications-no great or sudden modifications (*Natura non facit saltum*)
- Mismatches between animals and their environment, **transition to a new lifestyle** (for example, the upland goose and its webbed feet)
- Inhabitants of one country supplanted by non-native species, **variation in the intensity** of the struggle based on **locality**
- Seeming “**imperfections**” in nature (the sting of the bee)
- **Use and disuse**-reaction to external factors
- Reversions to **long-lost characters** (stripes on species of the horse-genus)
- Why should characters by which species of the same genus **differ** from each other be **more variable** than the generic characters in which they all agree?
- **Instincts** as inherited traits (the thrush of South America lines her nest like the British species)
- The imperfection of the **geological record**
- **Geographical distribution**- in the same continent, **under the most diverse conditions**, inhabitants are plainly related (descendants of the same progenitors)-**under the same conditions** inhabitants can be widely different due to long complete separation-**oceanic islands** are inhabited by certain species
- Existence of closely allied or representative species **in any two areas**- inhabitants of each area are related to the inhabitants of the **nearest source** whence immigrants might have been derived (Galapagos archipelago)
- **Homology** (framework of bones being the same in the hand of man-wing of bat)
- Explains why organisms that are quite different as adults are pretty **similar as embryos**
- **Rudimentary organs** (the teeth of the calf)

C) The reason naturalists and geologists **reject** natural selection

(short duration of the history of the world → immutable productions)

“we are always slow in admitting any great change of which we do not see the intermediate steps”-connection to **Lyell’s** geology

“plan of creation” or “unity of design” have **no explanatory value**

“Although naturalists very properly demand a full explanation of every difficulty from those who believe in the mutability of species, on their own side they ignore the whole subject of the first appearance of species in what they consider reverent silence”.

D) The **scope** of natural selection and the degree of **change** it can bring

- “I believe that animals have descended from **at most only four or five progenitors**, and plants from an equal or lesser number”.

“Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from **some one prototype**. But analogy may be a **deceitful** guide”.

- **Revolution** in natural history- Systematists won’t have to worry about the distinction between species and varieties

“Systematists will have only to decide (not that this will be easy) whether any form be sufficiently constant and distinct from other forms, to be capable of definition. and if definable, whether the differences be sufficiently important to deserve a specific name”.

a different distinction between species and varieties (connected at the present day by intermediate gradations)

Natural history will become a **more interesting** field of study

“The whole history of the world, as at present known [...] will hereafter be recognised as a **mere fragment of time**, compared with the ages”.

Further research opportunities in different fields, such as Psychology

Final Remarks:

The same laws that apply to the production (and extinction) of species apply to varieties. **No being is the product of special creation**, but of a continuous, very slow process.

As all the living forms of life are the lineal descendants of those which lived long before the Silurian epoch. There has been **no cataclysm** that breaks this slow process (\neq Cuvier).

The **main laws** that govern nature:

Growth with Reproduction, Inheritance, Variability, Ration of Increase, Struggle for Life, Natural Selection, Divergence of Character, and Extinction

↳ “whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, **evolved**”.

