# Selection

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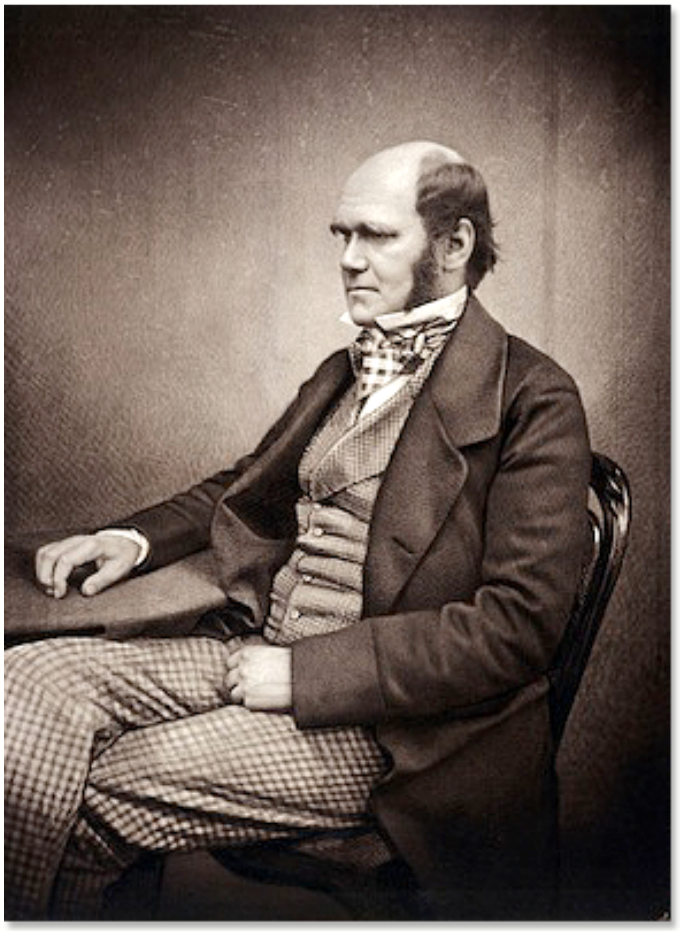
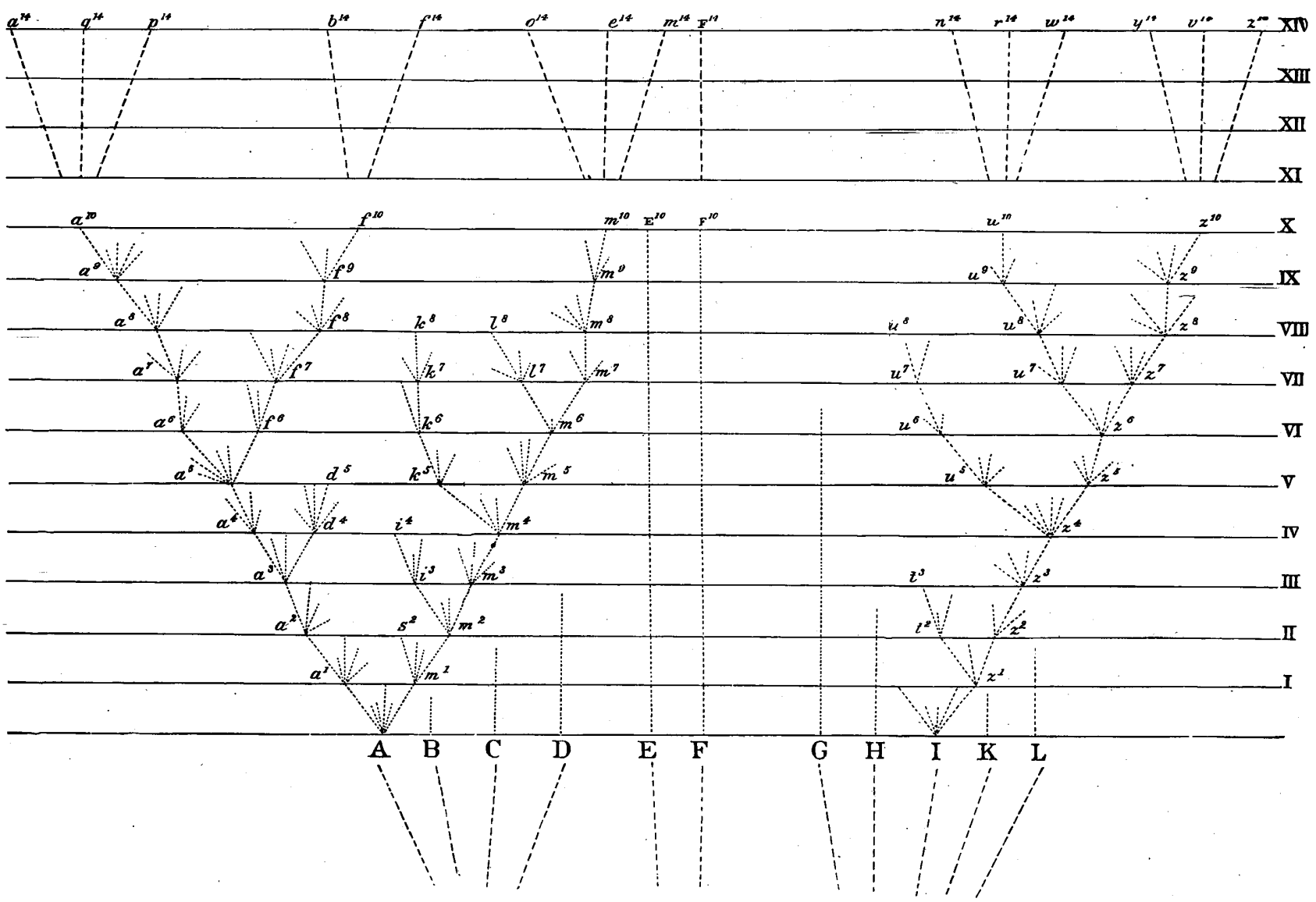
DARWIN.

A naturalist, reflecting on the mutual affinities of organic beings, on their embryological relations, their geographical distribution, geological succession, and other such facts, might come to the conclusion that each species had not been independently created, but had descended, like varieties, from other species.




XIV
XIII
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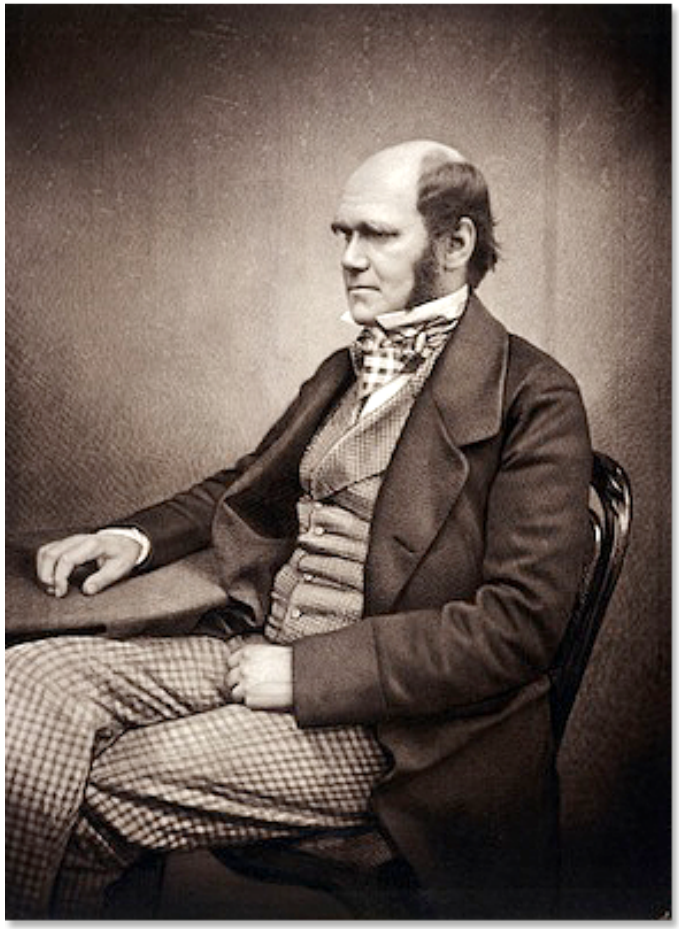
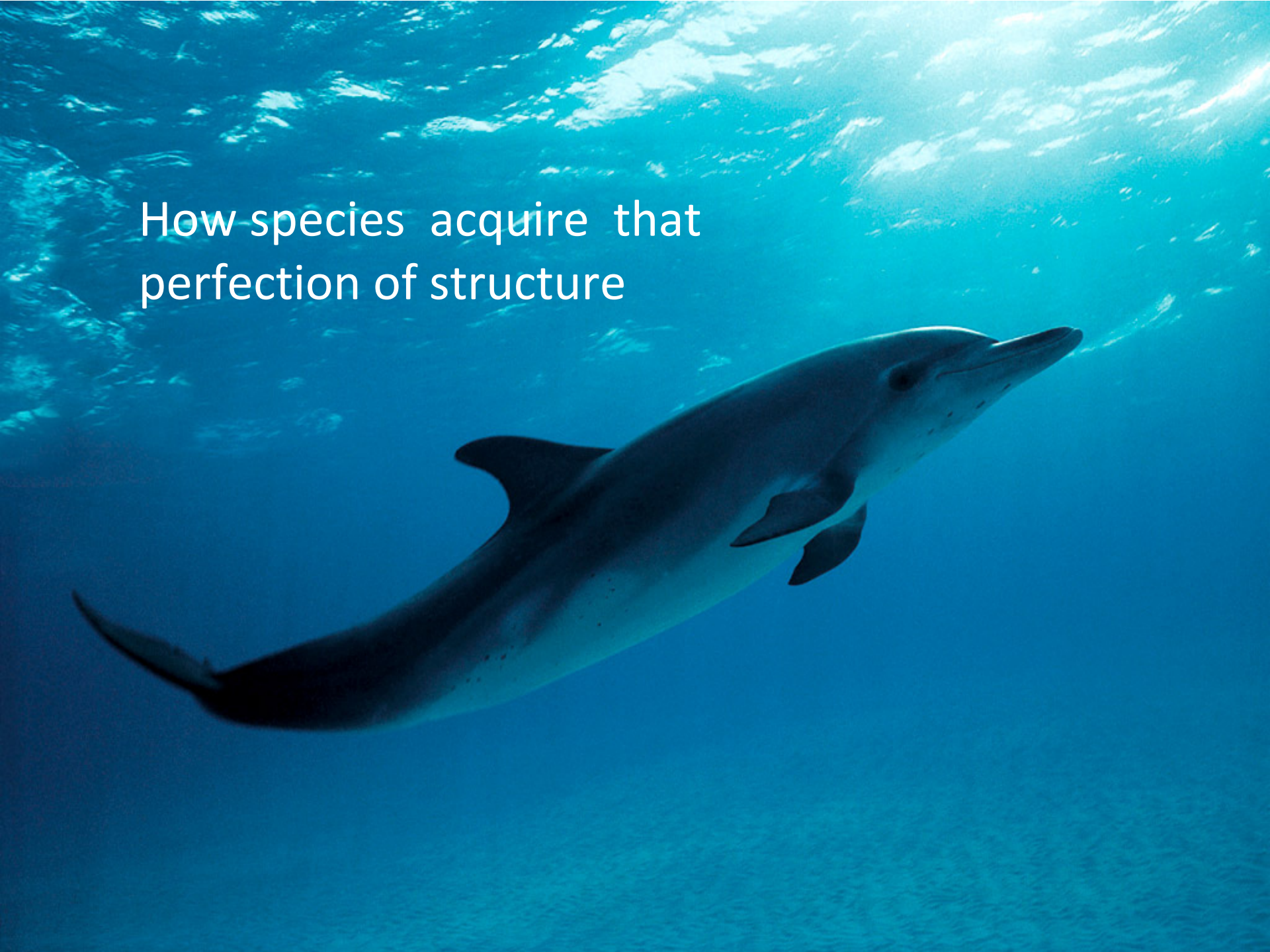
K
L

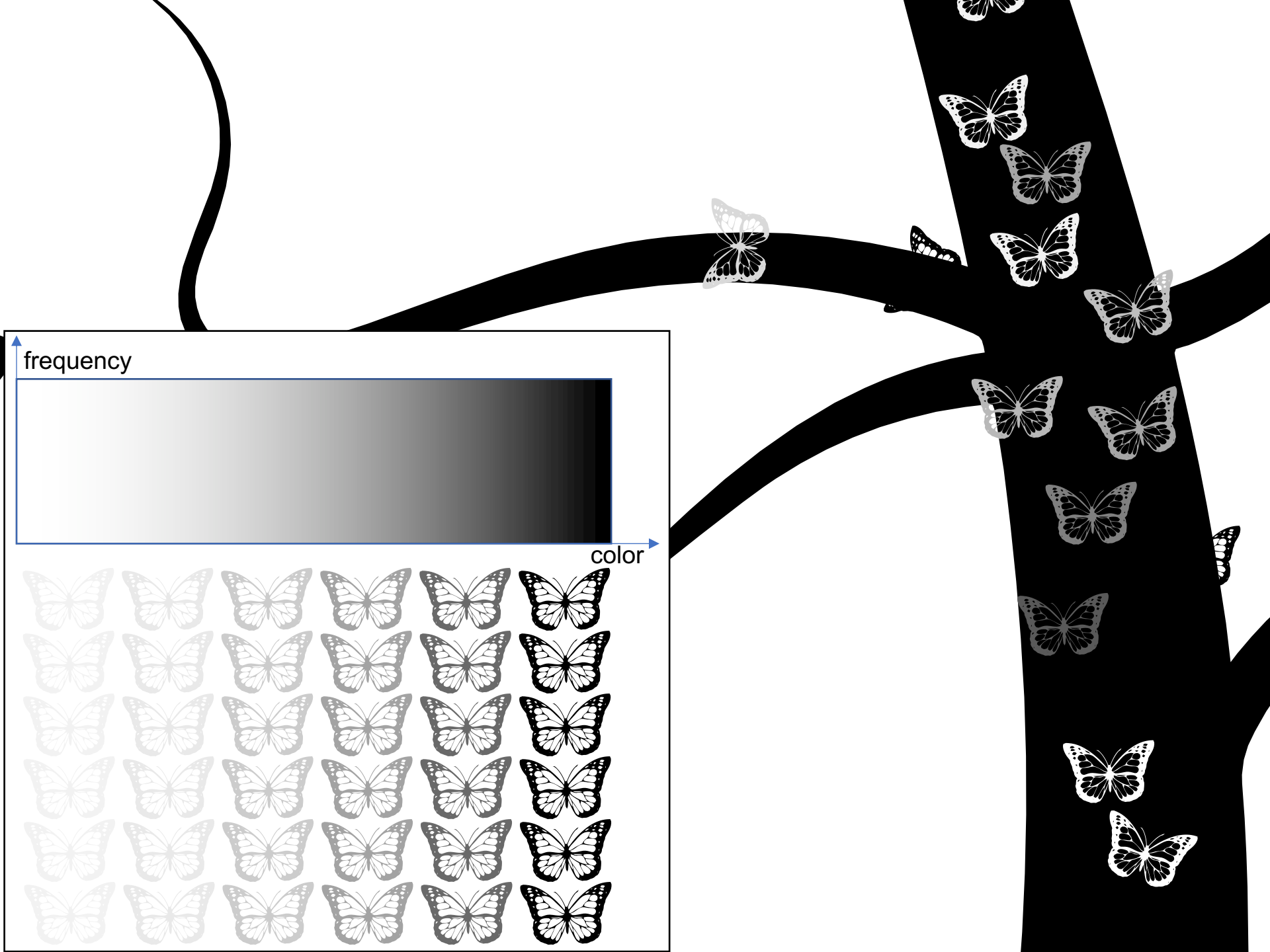
Bacteria
Eukarya
Archaea
Proteobacteria
Cyanobacteria
Animalia
Fungi
Plantae
Archezoa
Euryarchaeota
Crenarchaeota

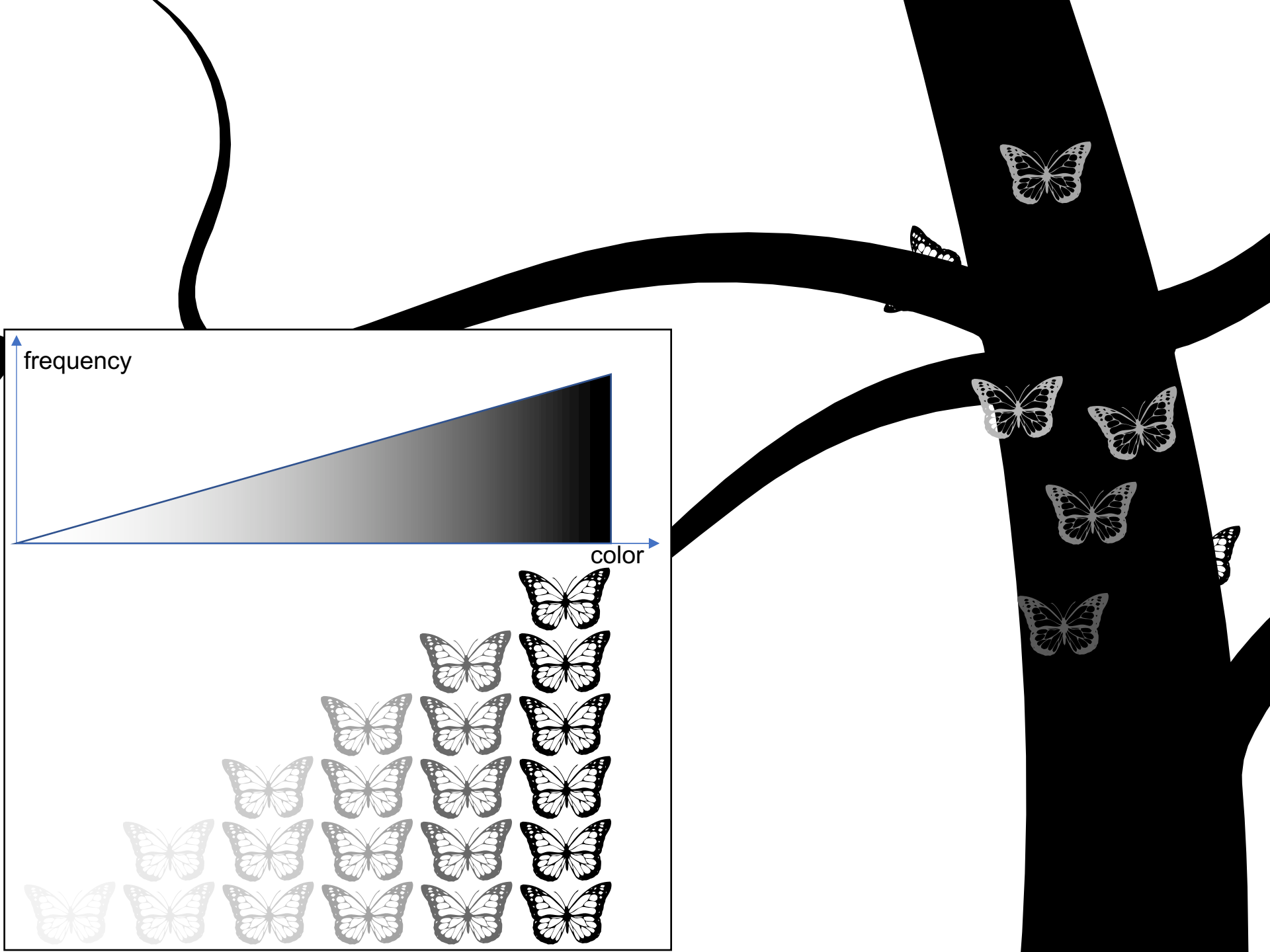
Nevertheless, such a conclusion, even if well founded, would be unsatisfactory, until it could be shown how the innumerable species inhabiting this world have been modified, so as to acquire that perfection of structure and coadaptation which most justly excites our admiration.




How species acquire that
perfection of structure

- Variation
- Inheritance
- Selection


frequency
color


frequency
color

# Variational vs Transformational processes

# The Price equation

$\Delta Z$

$Z$ - Some property (color)

$W$ - Survival

# The Price equation

$$\Delta Z = cov(Z, W)$$

$Z$ - Some property (color)

$W$ - Survival

# The Price equation

$$\Delta Z = cov(Z, W) + E(w\Delta Z)$$

$Z$ - Some property (color)

$W$ - Survival

# The Price equation

$$\Delta Z = \frac{cov(Z, W) + E(w\Delta Z)}{W}$$

$Z$ - Some property (color)

$W$ - Survival

# The Price equation

$$\bar{W}\Delta E = cov\,(Z, W) + E(w\Delta Z)$$

$Z$ - Some property (color)

$W$ - Survival

# The Price equation

$$\bar{W}\Delta E = cov\,(Z, W) + E(w\Delta Z)$$

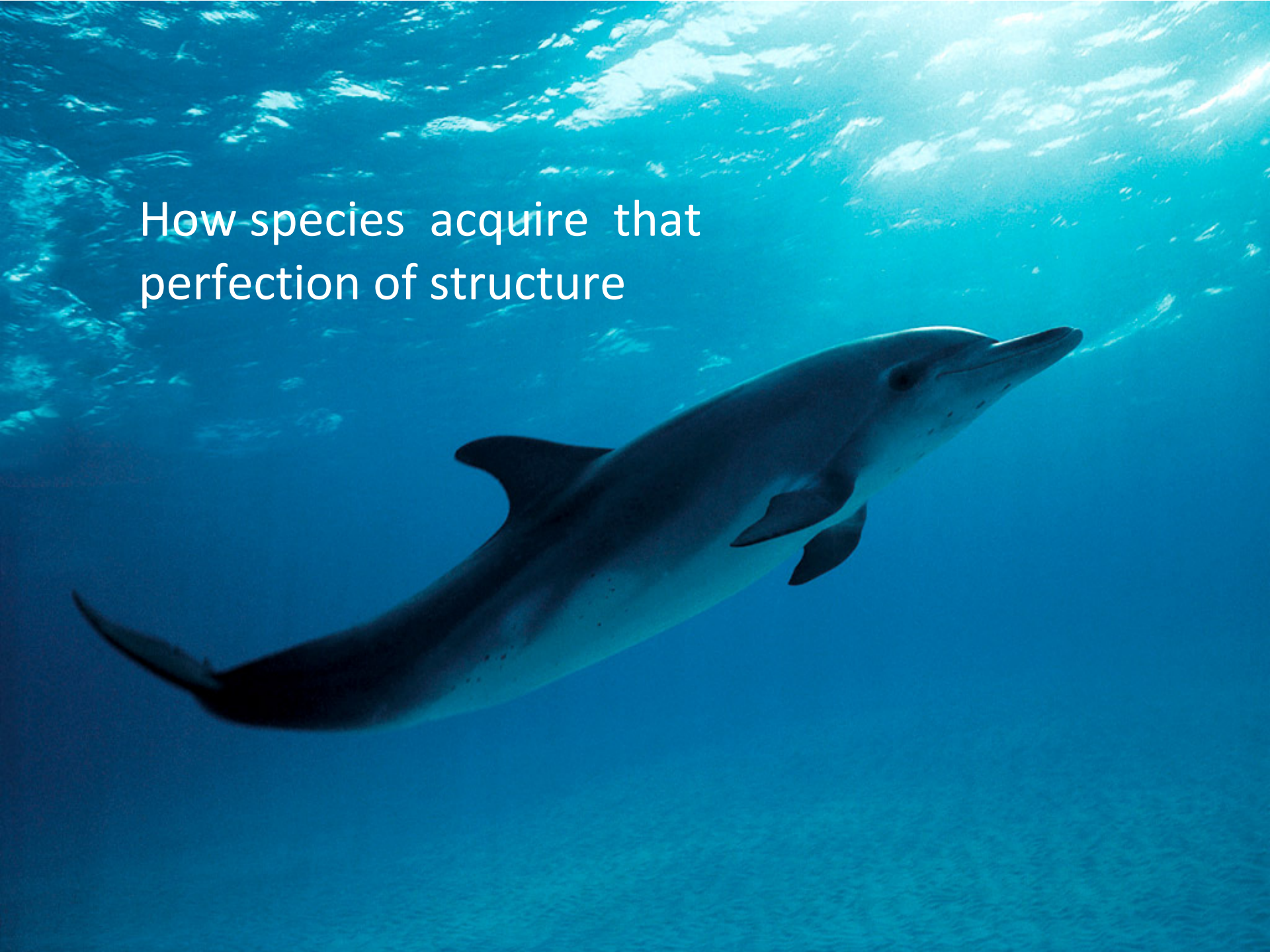
selection

# The Price equation

$$\bar{W}\Delta E = cov\,(Z, W) + E(w\Delta Z)$$

selection

transformation


How species acquire that
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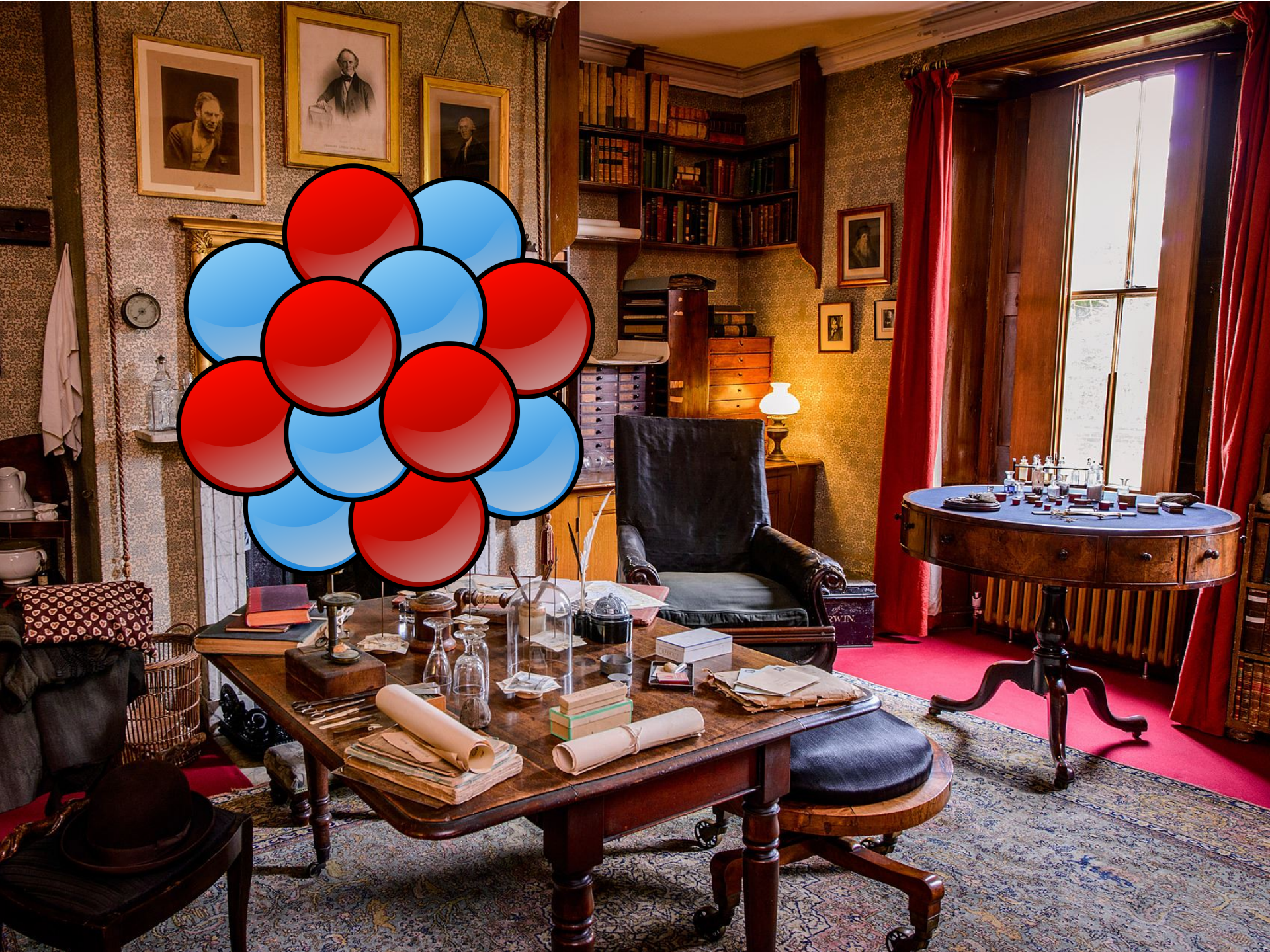

# References

Insert references here. In-text citations are recommended, and reference slide citations are critical.

Always include references for borrowed ideas to set the expectation for students.