

Opening Thought Questions – 2/2

1. What is evolution?
2. What is natural selection and how does it work?

Instructions:

1. Based on your knowledge from other classes you've take and Tuesday's lecture, think about this question on your own and write down your answers/thoughts in your notes.
2. Next, you will discuss this question with your neighbor.
3. Finally, we will share our thoughts about this question as a class.

1. What is Evolution?

Evolution is the change in gene frequencies over time in a population.

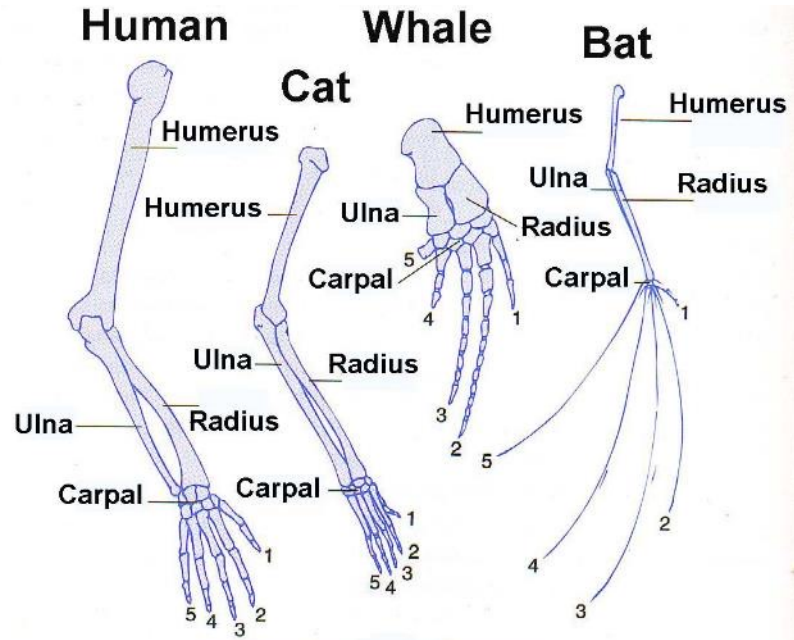
2. What is natural selection and how does it work?

Natural selection is differential survival and reproduction of individuals due to their phenotype in a population.

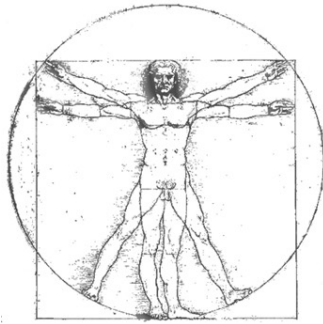
Requirements of natural selection are:

- Tremendous reproductive potential of organisms
- Populations remain stable (differential mortality/survival)
- Organisms vary (trait variation)
- Variation is heritable
- Differential reproductive success

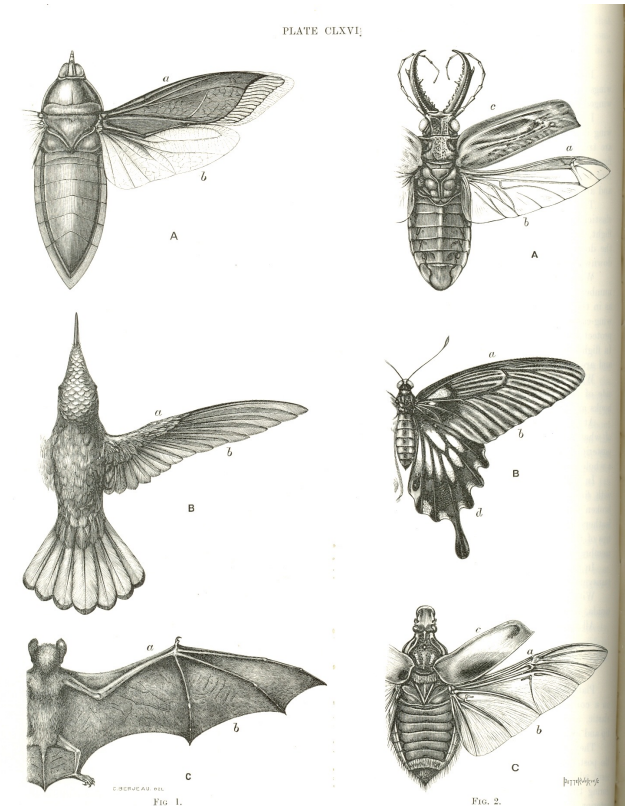
Homology is similarity due to shared ancestry

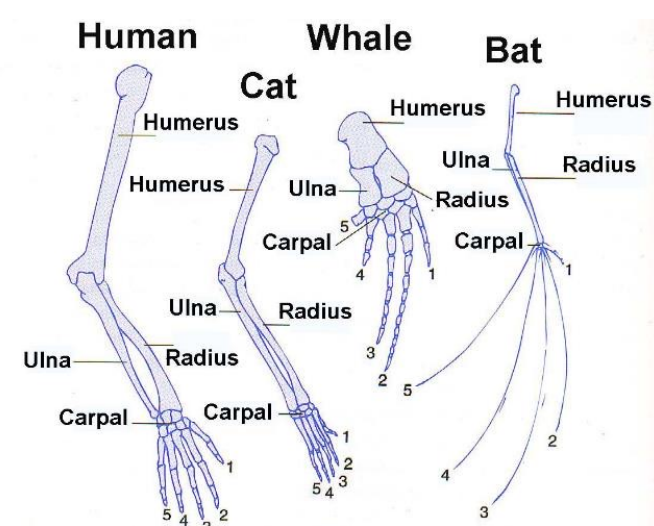
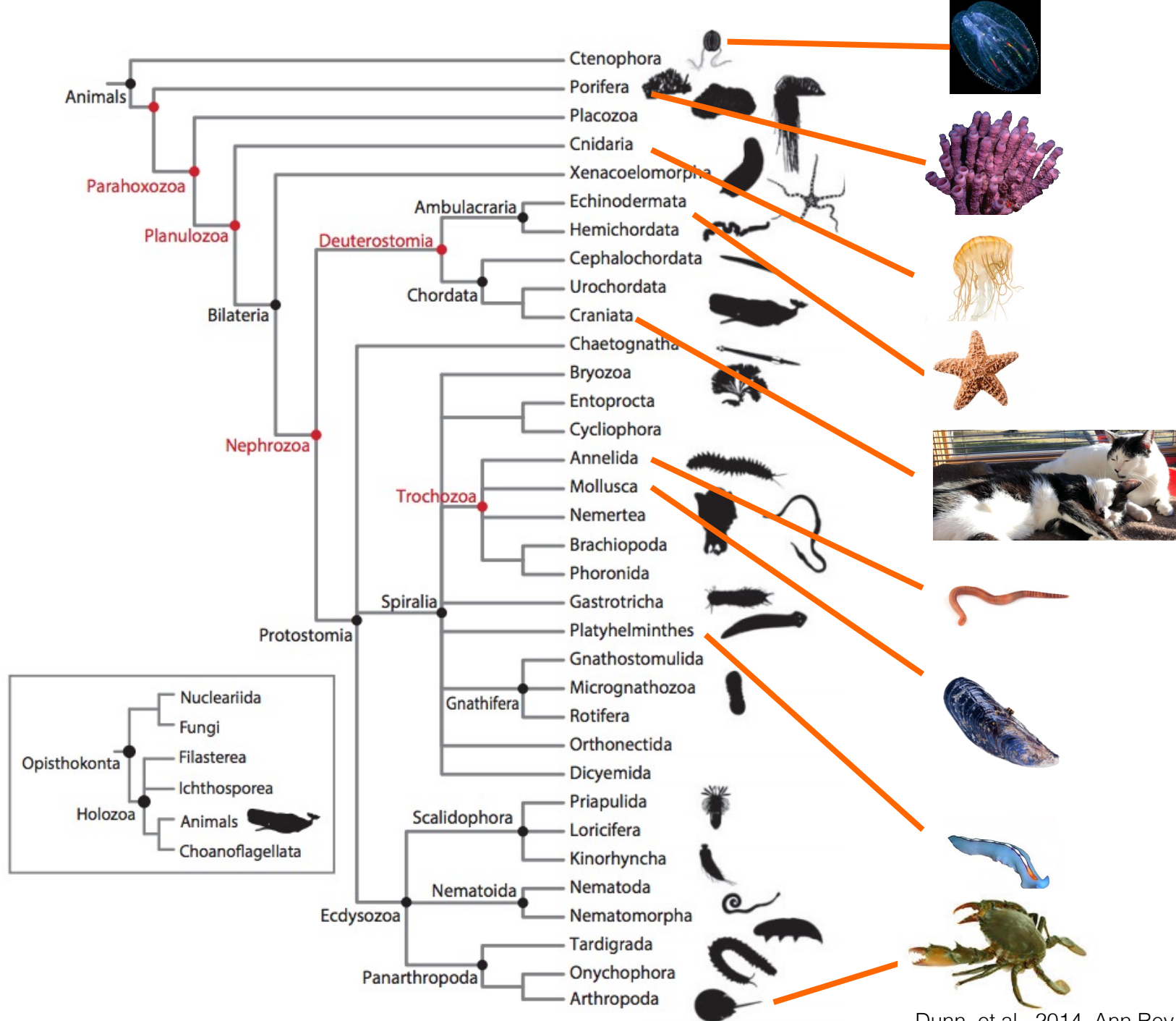


From: Ridley, M. 1996. Evolution. Blackwell Science.

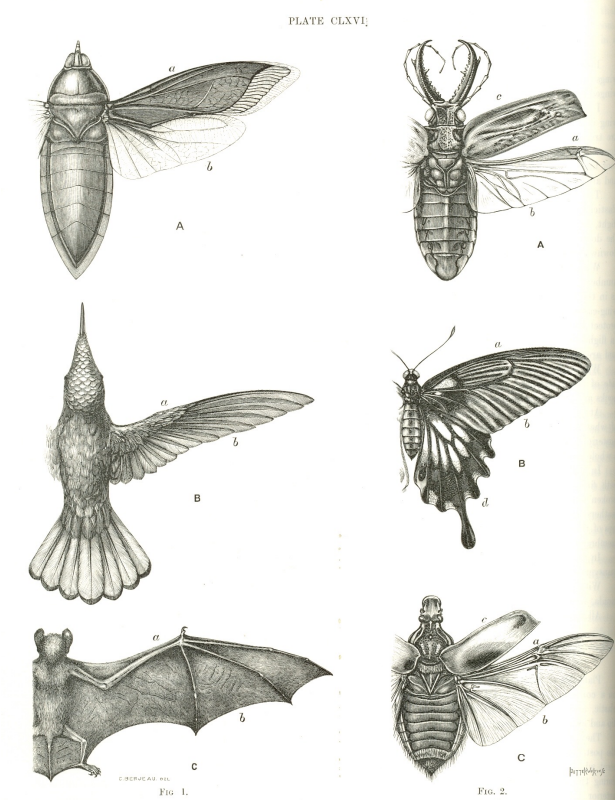


Homoplasy is similarity due to **convergence**





From: Ridley, M. 1996. Evolution. Blackwell Science.



Dunn, et al., 2014. Ann Rev Evol Ecol System.



Crustacea: Ostracoda

Homoplasy-really important too!

Tells us about function and adaptation

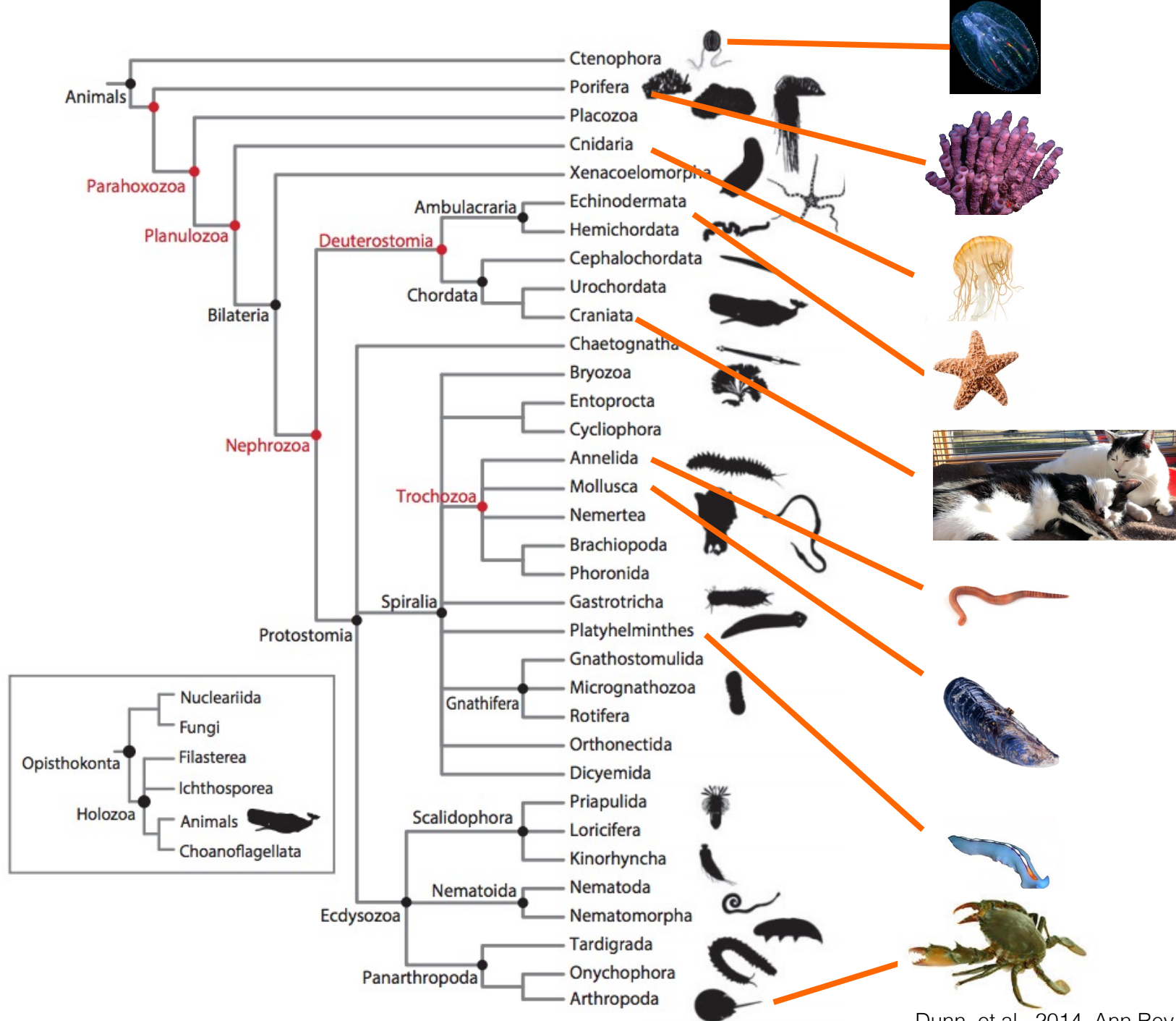
Example: bivalved shells



Crustacea: Conchostraca



Mollusca: Bivalvia



Crustacea: Ostracoda



Crustacea: Conchostraca

Homology: the key to understanding evolutionary relationships among taxa

Homoplasy/Convergence: useful for understanding the diversity of life on Earth and adaptation

Convergence at the gene level

It does happen!

Similar gene sequences that code for similar phenotypes has been documented in echolocating dolphins and bats.

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Genome-wide signatures of convergent evolution in echolocating mammals

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