

Evolution 2

New lab section opened!

- Survey responses
- the cheetah story
- results (ex. Horses & Limbs)
 - "common ancestor" vs "intermediate form"

Weds 5³⁰ - 8³⁰ pm

W-2-032 #27201

*lab section swap
meet" after class

- Be sure you fill out Student Info Sheet if you didn't on Monday or you will be dropped from class
- Labs start NEXT week
- Free HMNH tickets handed out FRIDAY in lobby after class
- iClicker starts monday; get transmitter at Bookstore

in lobby

Important Survey Quotes

The following were taken and adapted from your responses to the survey on Monday.

- * 1) The cheetah's ability to run faster evolved because they needed to learn to adapt to environmental changes and they evolved through the years by learning from previous cheetahs. ^a b

a) not learning - individual cheetahs don't get faster over their lifetimes
(average speed of each generation increases)

b) speed not passed as learning - its passed genetically

- 2) If the prey were running faster the need to be faster had to be adapted into their systems.

* evolution is not an active response to a need
(if a trait is advantageous, those with it will have more offspring ∴ more frequent in next generation ⇒ passive process)

- 3) Cheetahs have dog-like paws allowing them to run faster. At some point in time cheetahs must have mixed with canines to develop this feature. Over time these paws have stayed the same.

convergent evolution = similar features with different origins (ex. wing of bird & fly)
→ different species cannot interbreed

4) The slower cheetahs died out as a result of not being able to catch prey, while the faster ones would survive from catching prey. The ability to catch prey remains while the ability of not being able to catch prey dies out.

not necessarily "adapt or die"

ex. lions are slower but live just fine

better: "fast cats exploit unexploited food source (fast prey)"

5) There was a variation in the population of ancestors that were only able to run 20mph. A select few had the gene variation to run faster. These cheetahs were able to catch prey easier so they became stronger than the others. This allowed them to reproduce more and healthier offspring than the slower cheetahs. By reproducing, they passed on the gene to run faster and those offspring were more likely to survive.

AOK

In formal terms, like #5

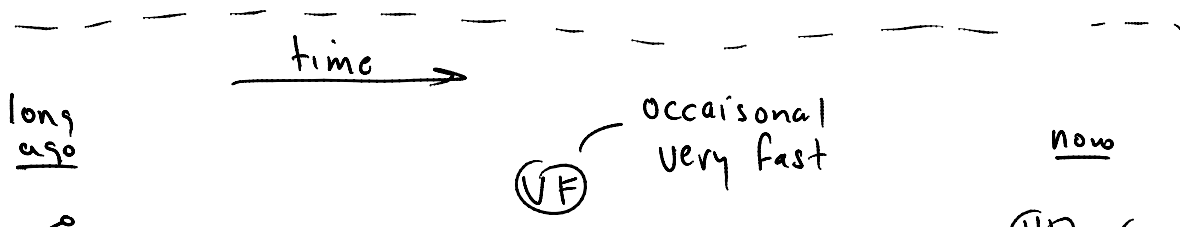
- ① more offspring are born than survive (not all cats live to reproduce)
- ② variation in individual characteristics & much of this variation is genetic (genes partially control speed & fast cats have fast kids)

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- ③ this variation influences reproduction (fast cats eat better \Rightarrow have more kids)

\therefore higher proportion of individuals in next generation will have advantageous trait

\Rightarrow evolution



ago



fast ones
at advantage:
eat more
→ have
more kids
than slow
ones

many large
slow cats
& a few
fast ones

(VF) Very fast

(S) (S)

(F) (F)

(F) (F)

(F) (F)

(F) (F)

(S*) different advantage
slow

but
strong
(different mutation)

now

(VF) (VF)

(UF) (UF)

(UF) (F)

(F) (S)

= cheetahs

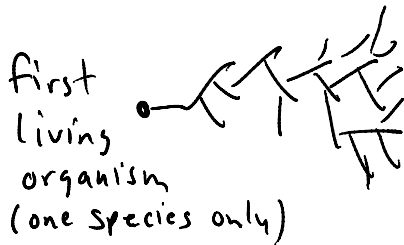
(S*) (S*) (S*)

= lions

Result

~ 3500 ma

(1 ma = 1 million years ago)



first
living
organism
(one species only)

each branch =
new species
• some continue
• some go
extinct

now (0 ma)

many different
species

• not progress but lots of "experiments"

terms

• common ancestor of A and B - an organism whose
descendants gave rise to both A and B

* intermediate form between A and B = an organism
on the evolutionary lineage from A to B
with intermediate phenotype between A and B

not "progress" but "experimentation"

Evolution of the Equidae (horse-like animals)

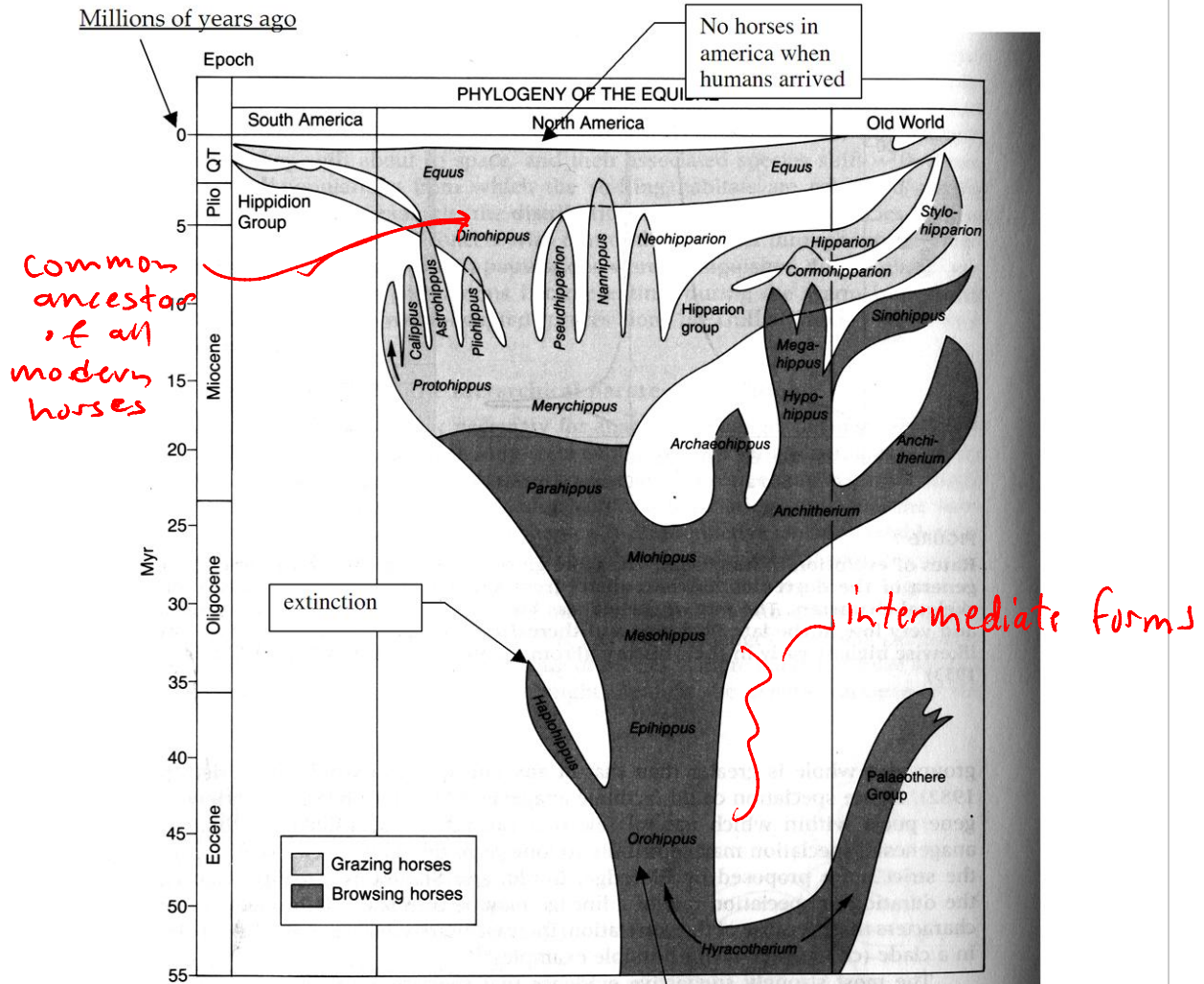
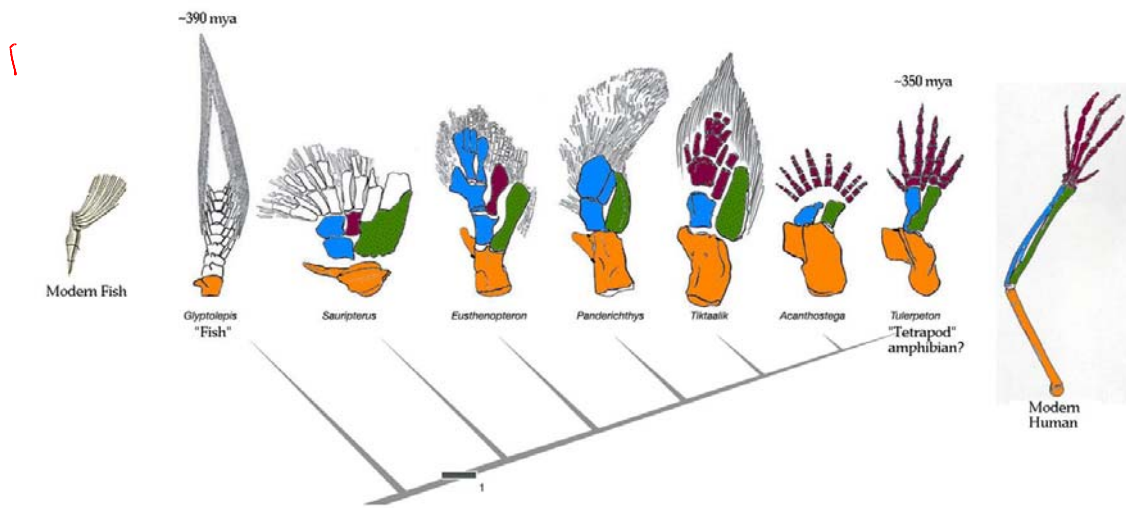


FIGURE 8
The phylogeny of the horse family, Equidae, as currently understood. Note that the grazing habit evolved in the Miocene, in only one of the lineages extant at that time. (From MacFadden 1985)

Width indicates number of species of each group (diversity not population).

Evolution of Vertebrate Limbs

intermediate forms



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