

Evolution by natural selection

Evolution

Natural selection

The nature of adaptation

Outline

Evolution

Change through time

Relationships between species

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White beds contain fossilized tracks of vertebrate animals that lived about 260 million years ago.



Limestone accumulated in the oceans about 335 million years ago, burying marine animals and preserving their skeletons.



Slopes made of mud laid down in a shallow sea about 500 million years ago contain fossils of early arthropods called trilobites.

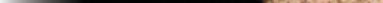


Figure 22.14
Biology: How Life Works

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Transitional forms



Figure 22.22 (Part 2)
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► *See book*

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Ground finches (see textbook)

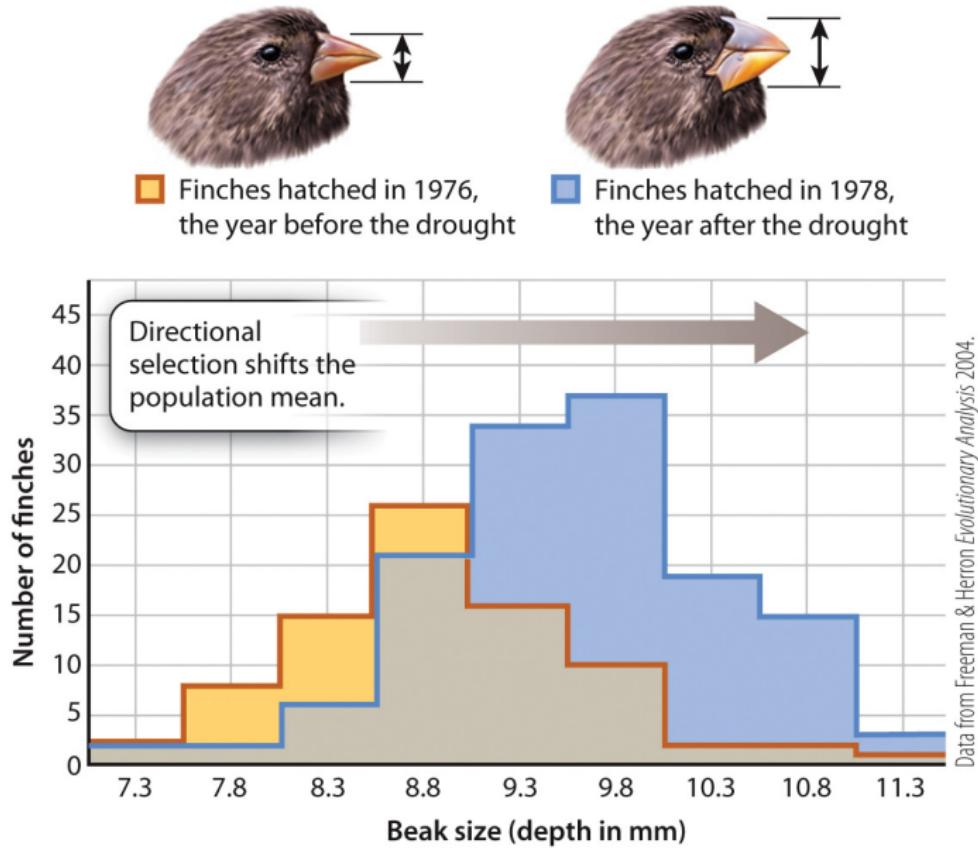
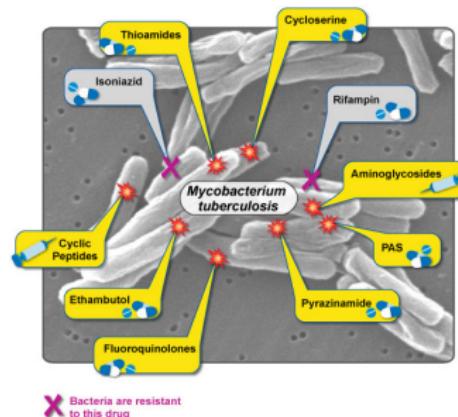


Figure 20.8b
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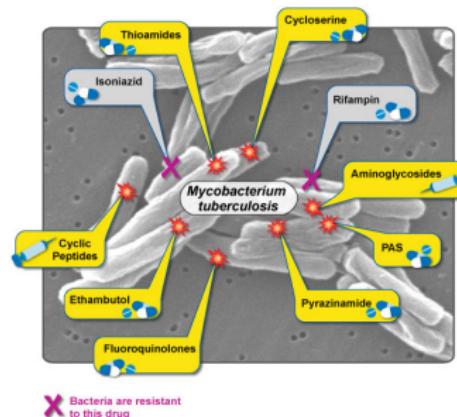
Tuberculosis

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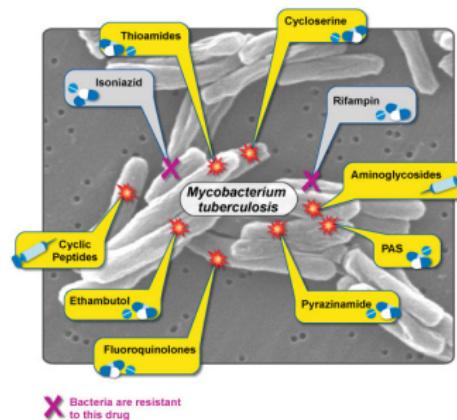
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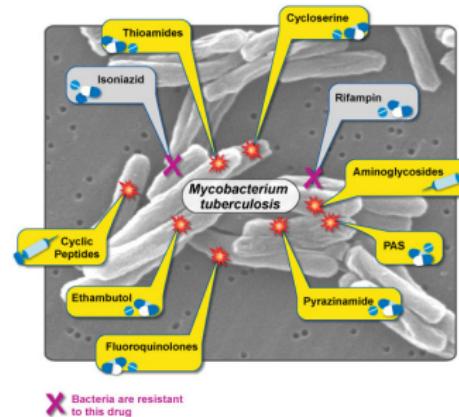
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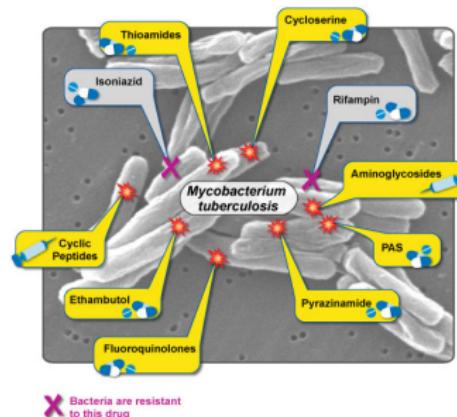
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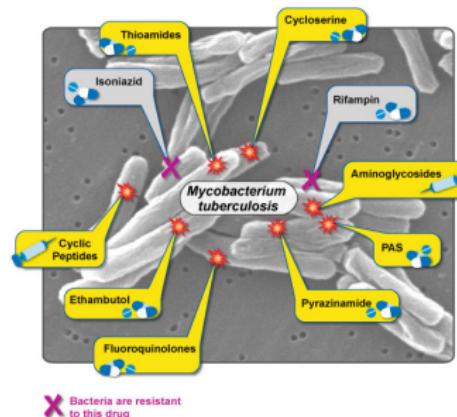
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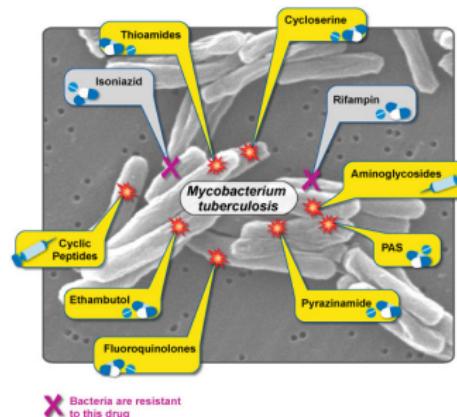
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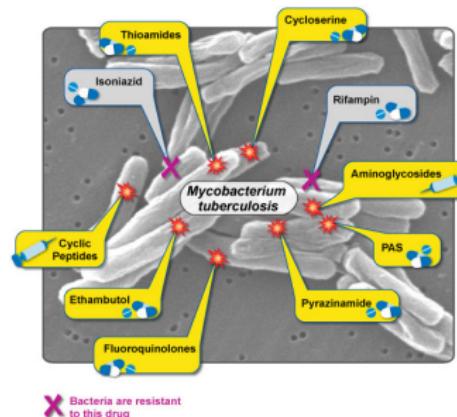
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E. coli (see textbook)

At the first time point ($t = 0$), the numbers of ancestral and descendant bacteria are similar. The ratio is 1:1.

At the second time point ($t = 1$), there are greater numbers of descendant bacteria and fewer ancestral bacteria. The ratio is no longer 1:1.

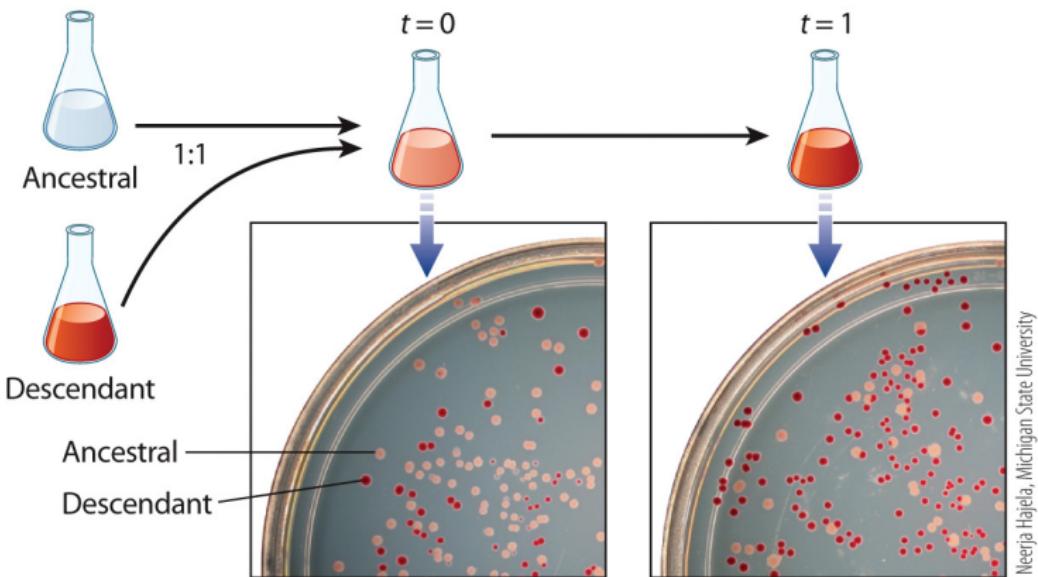
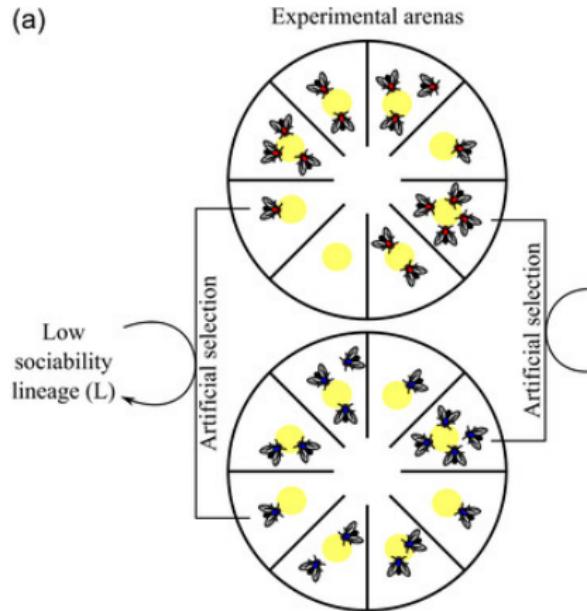


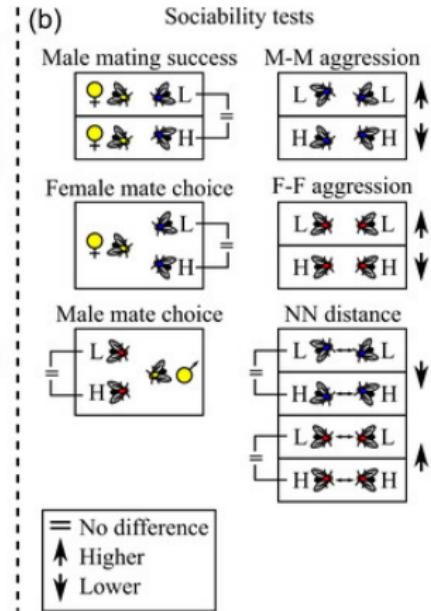
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Sociable fruit flies:

(a)



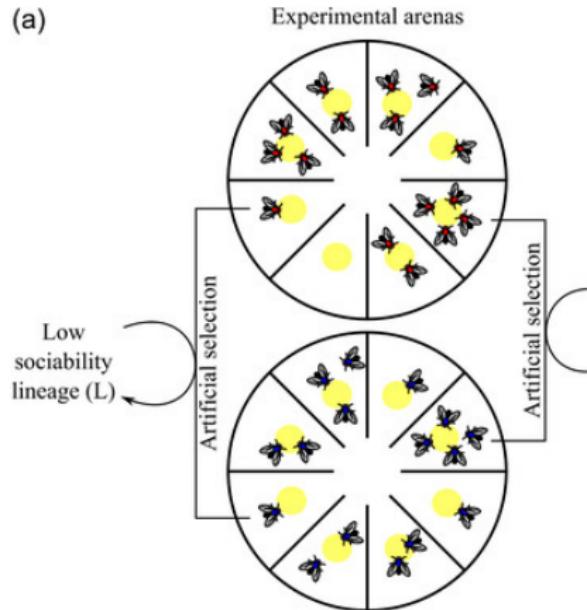
(b)



► Flies selected to hang out with each other or not

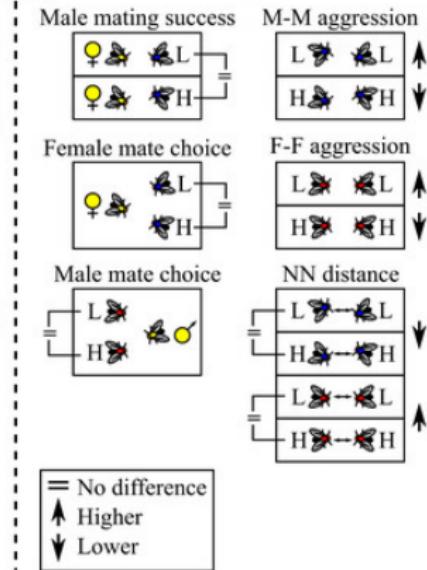
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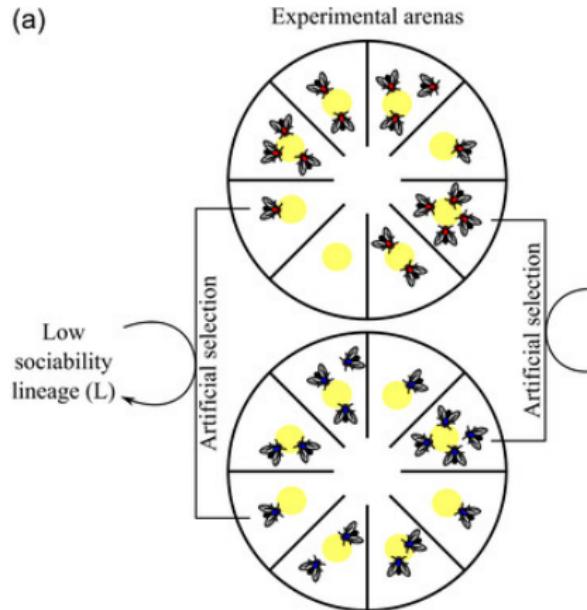
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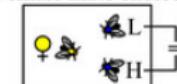
Male mating success



M-M aggression



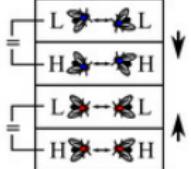
Female mate choice



Male mate choice



NN distance

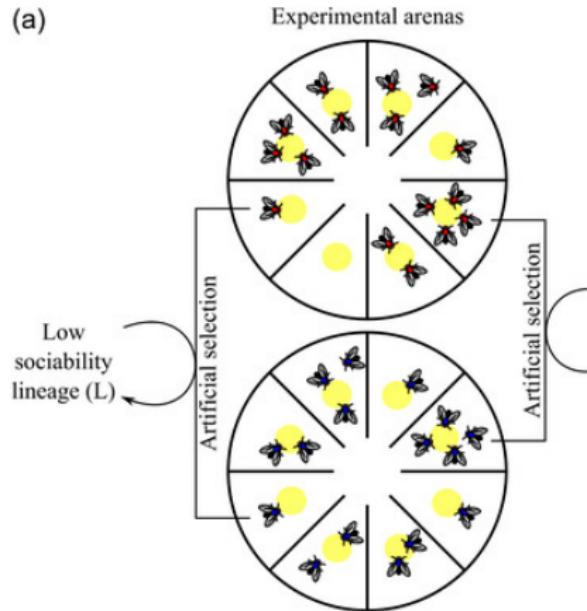


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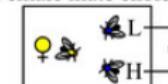
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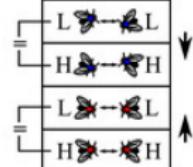
F-F aggression



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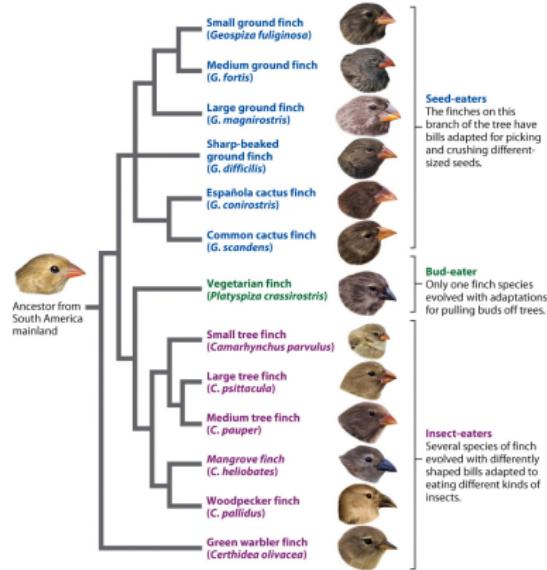


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▶ See book

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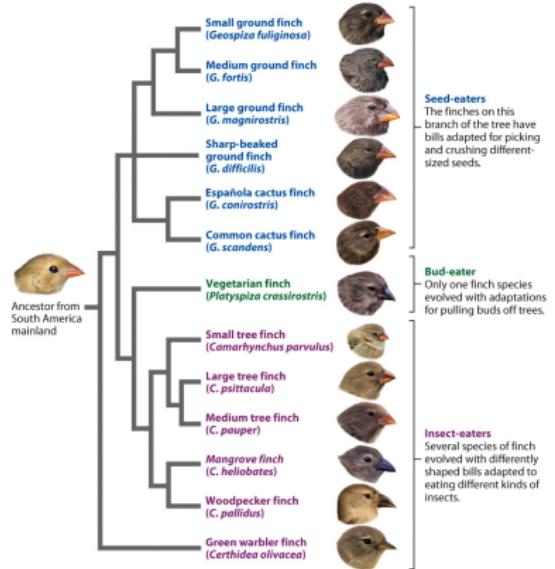


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► See book

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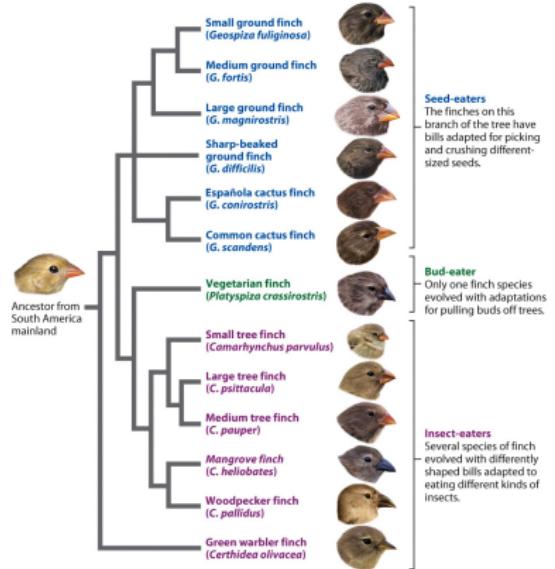


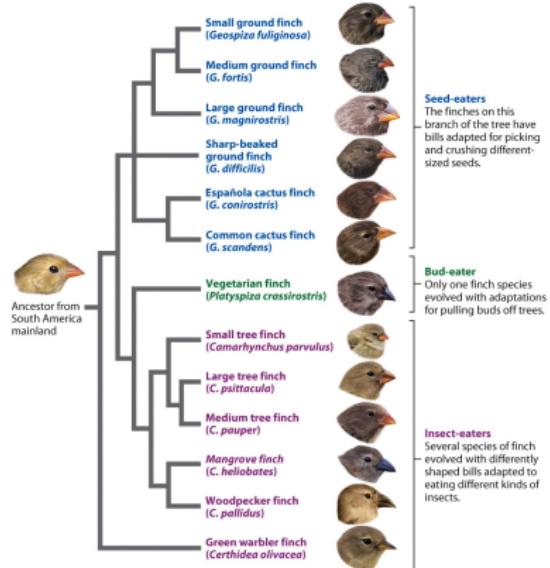
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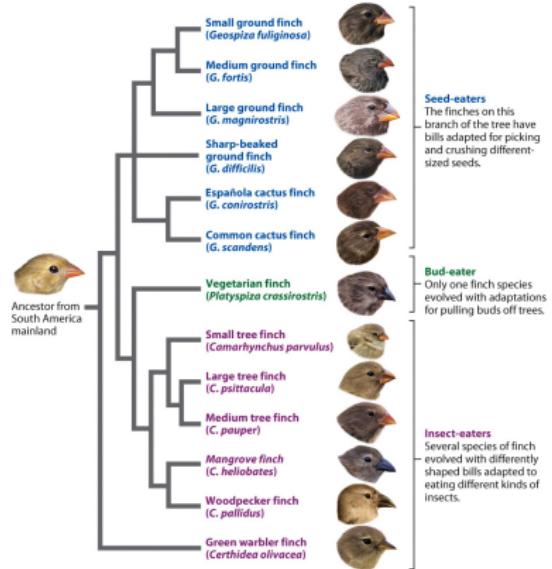


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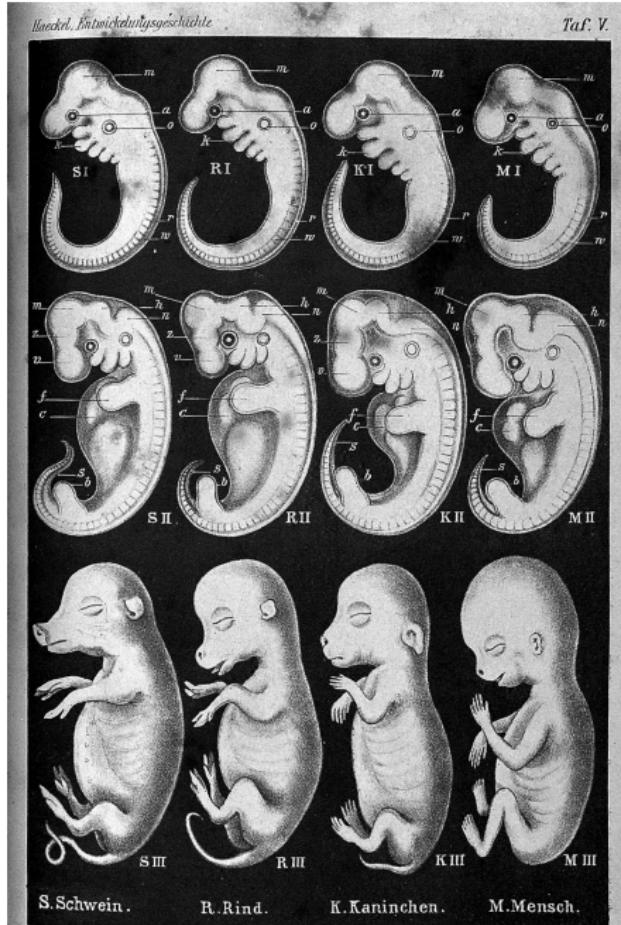
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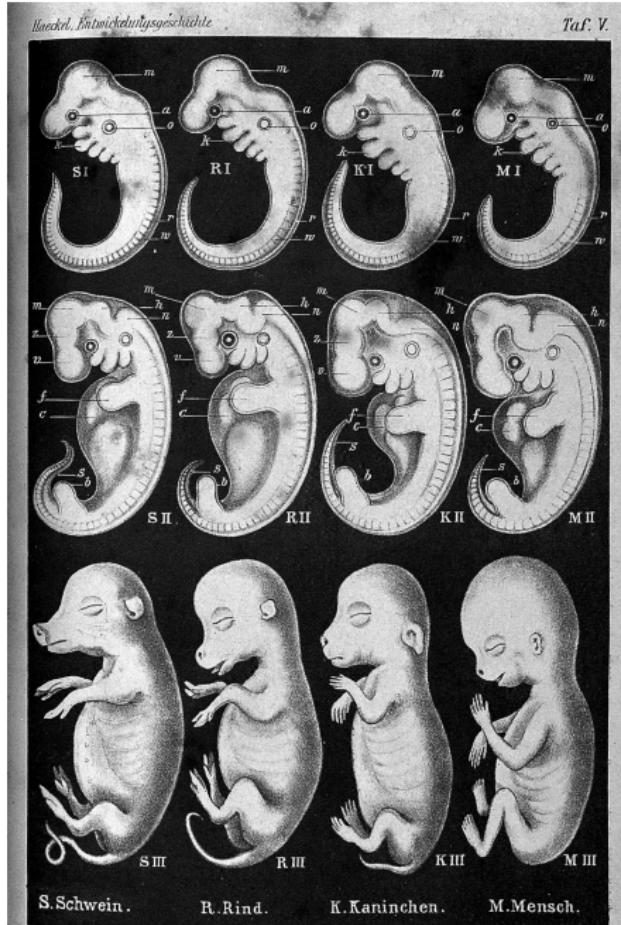
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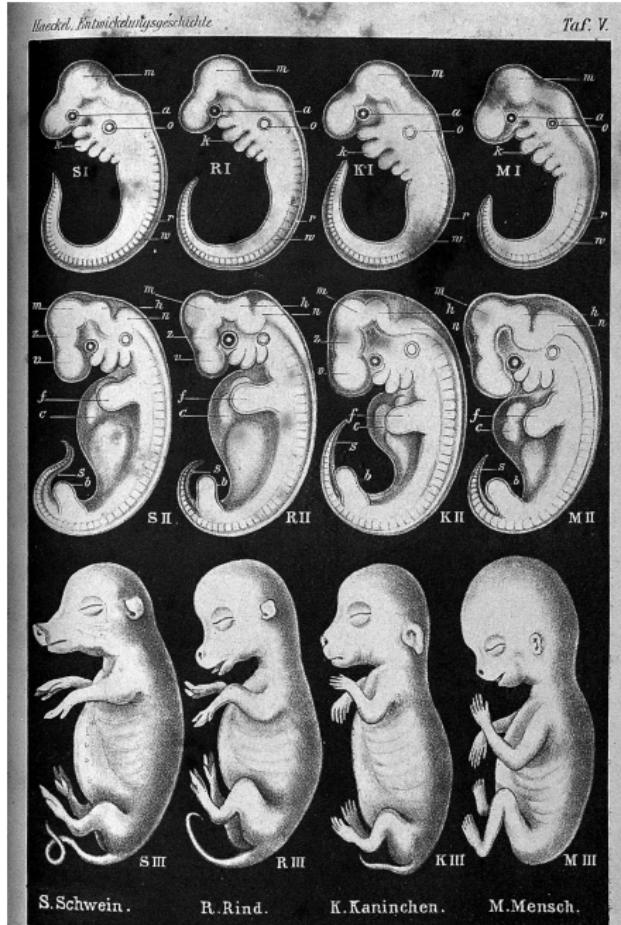
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► Embryos of all vertebrates show striking similarities

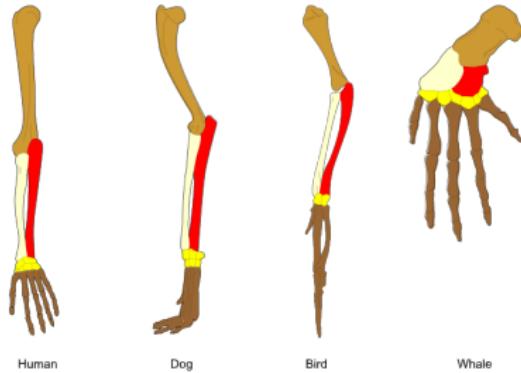
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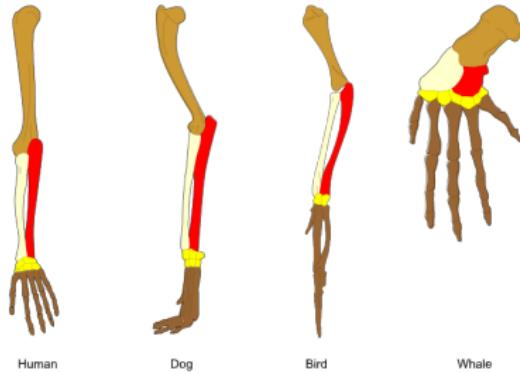
► Embryos of all vertebrates show striking similarities

Structural homology



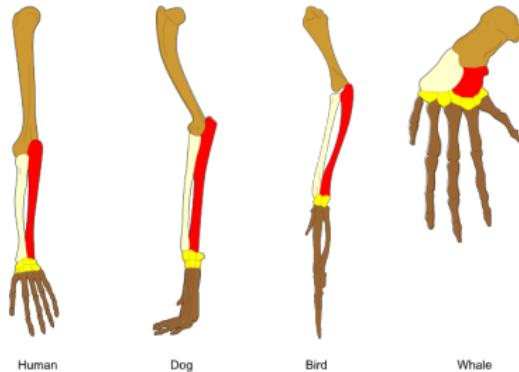
► **Structural homology** is homology at the level of developed organisms.

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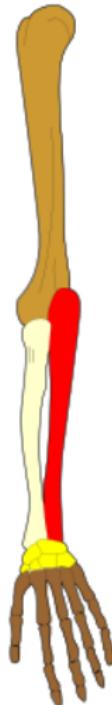
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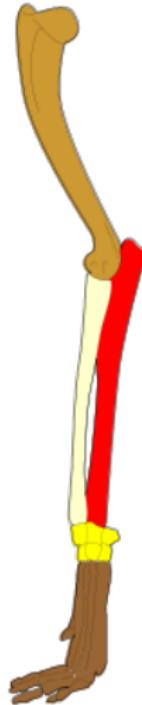


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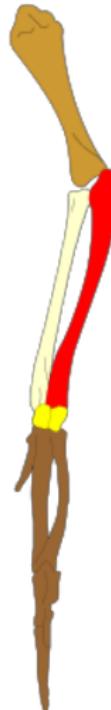
Tetrapod limbs



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Dog



Bird



Whale

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Natural selection

The nature of adaptation

Natural selection

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Finch beaks (see textbook)

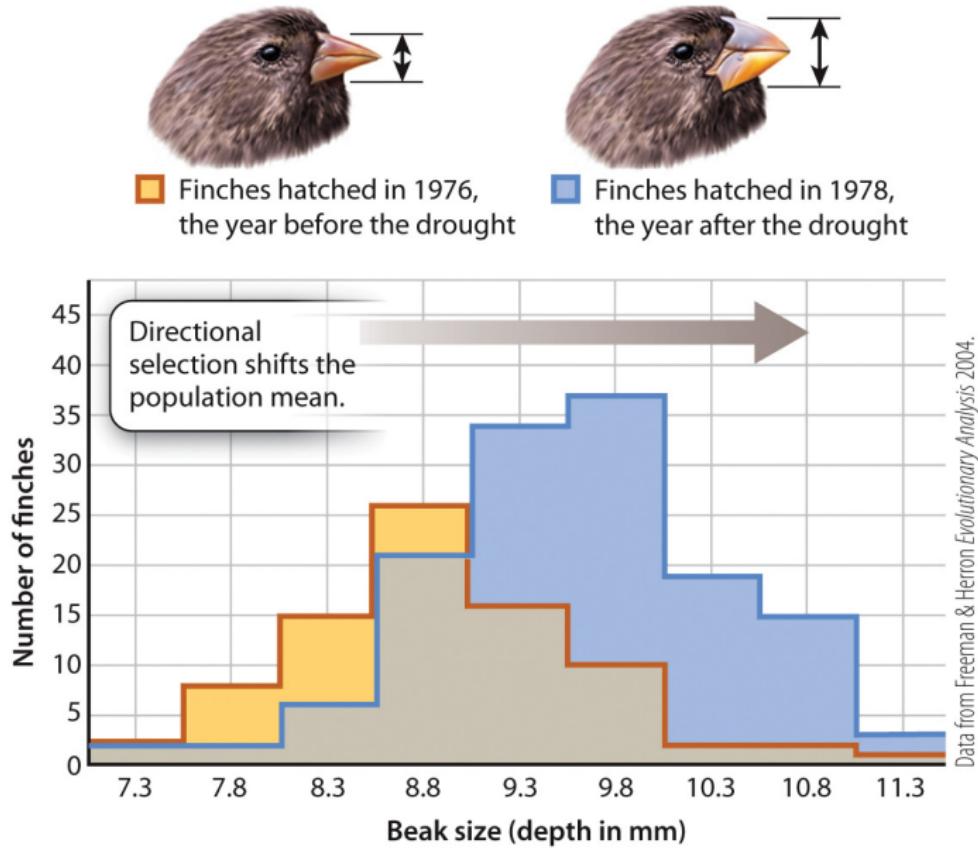


Figure 20.8b
Biology: How Life Works
© Macmillan Learning

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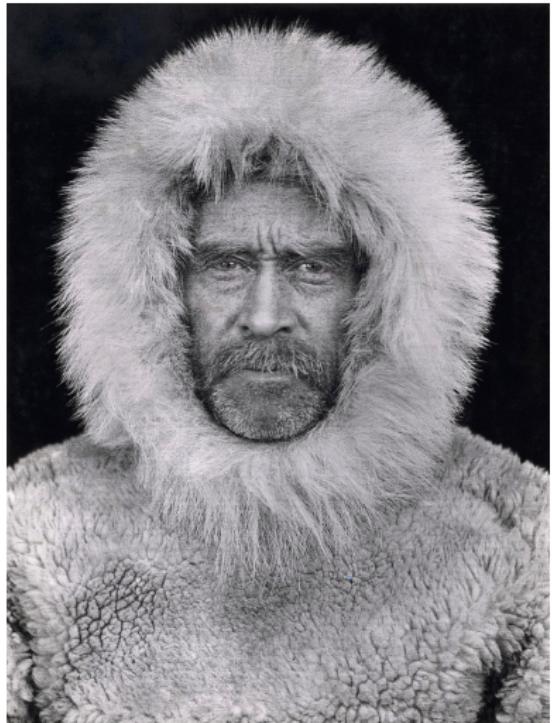
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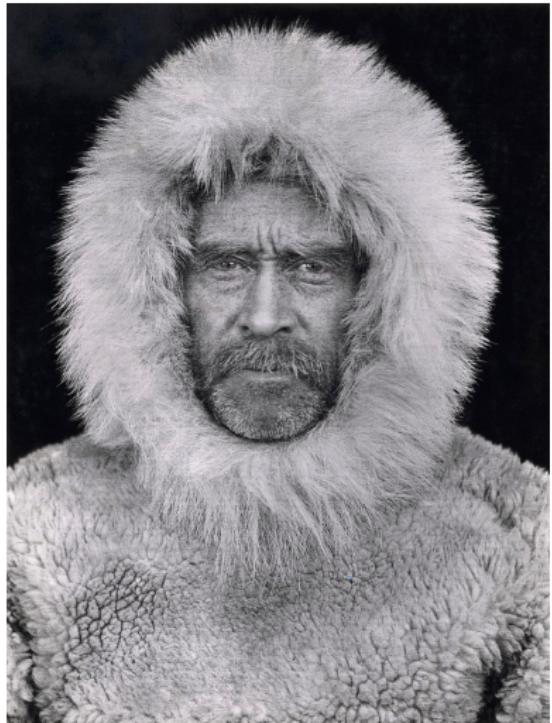
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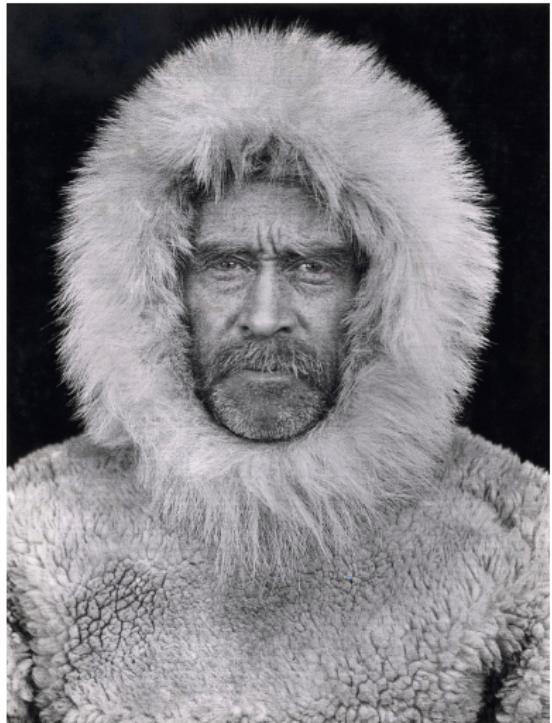


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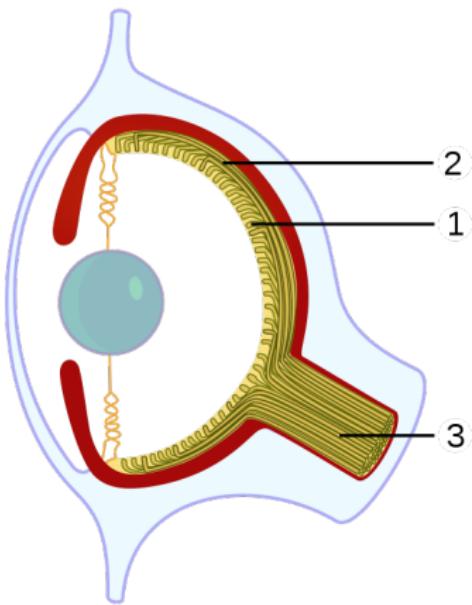
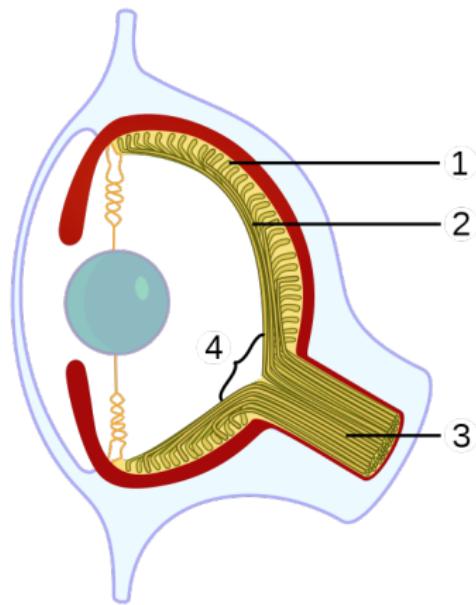
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