

Evolution by natural selection

Evolution

Natural selection

The nature of adaptation

Outline

Evolution

Change through time

Relationships between species

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Fossils (see textbook)

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



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Figure 21.22 (Part 2)
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► See book

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Figure 22.22 (Part 2)
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Figure 21.22 (Part 2)
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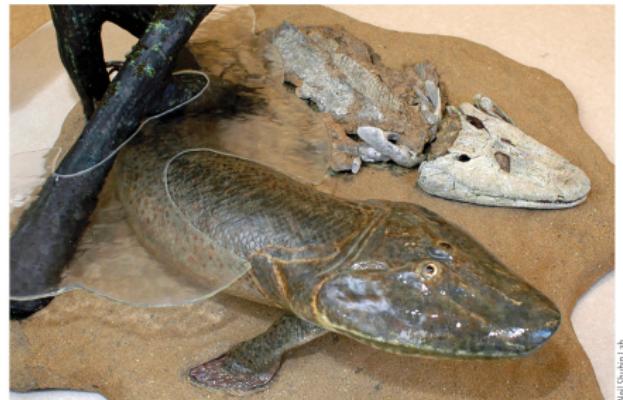


Figure 21.22 (Part 2)
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Ground finches (see textbook)

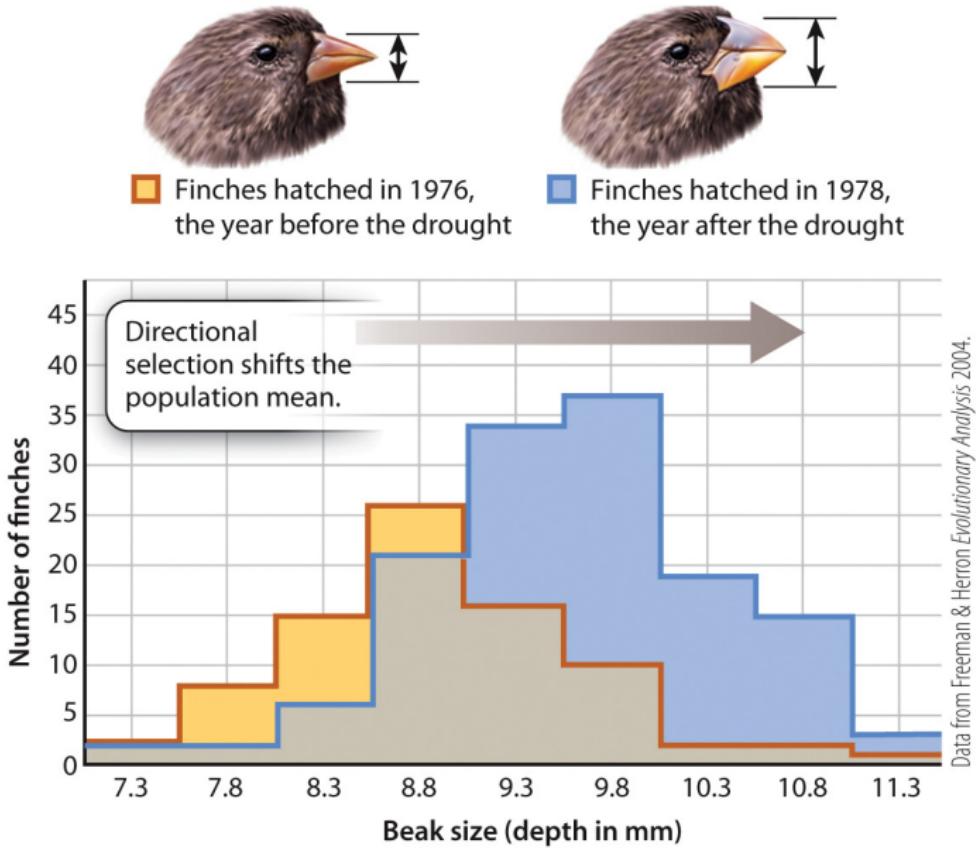
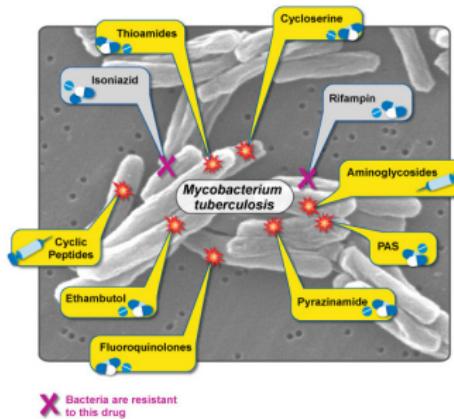


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Tuberculosis

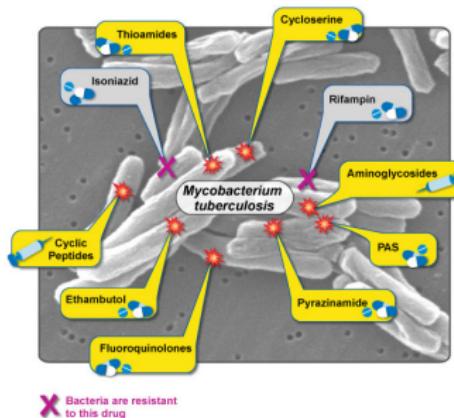
- By the time tuberculosis disease becomes apparent, there are usually many millions of bacteria in the lungs



Bacteria are resistant to this drug

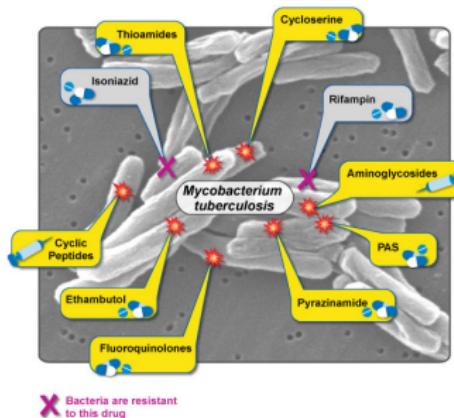
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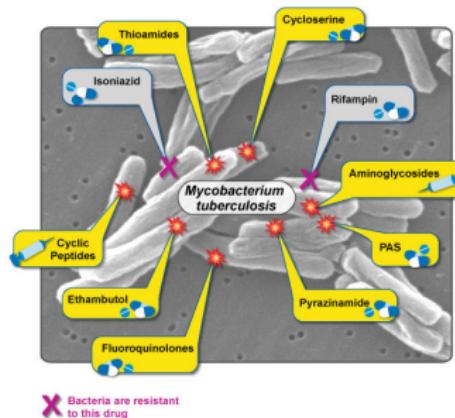
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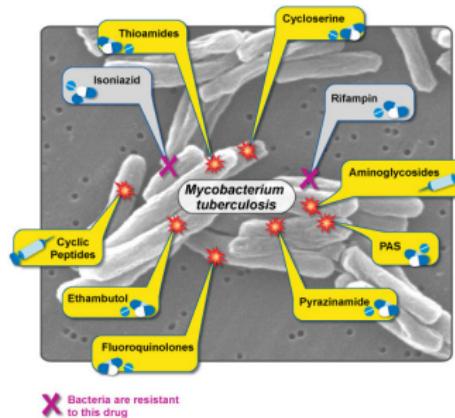
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E. coli (see textbook)

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.

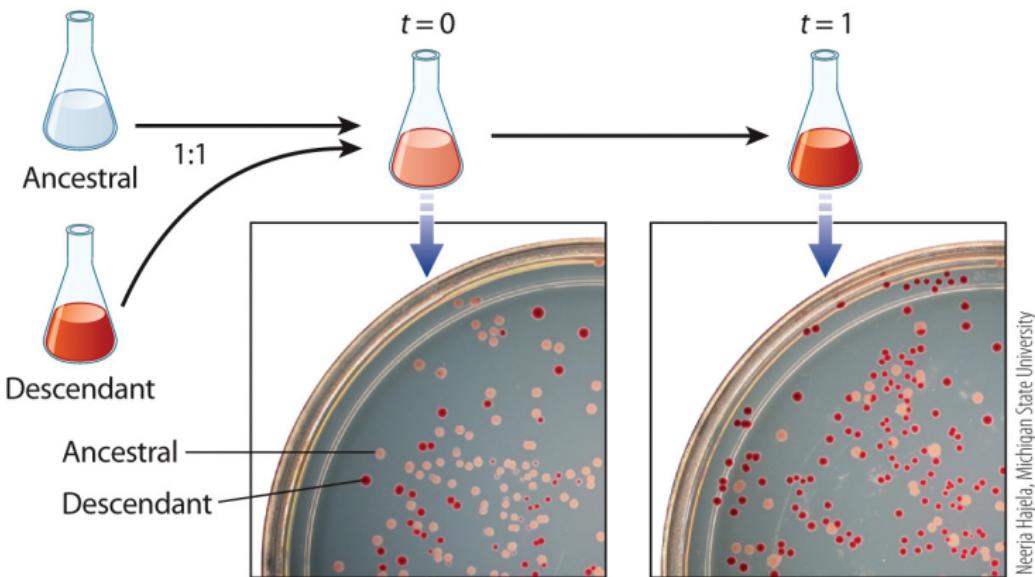
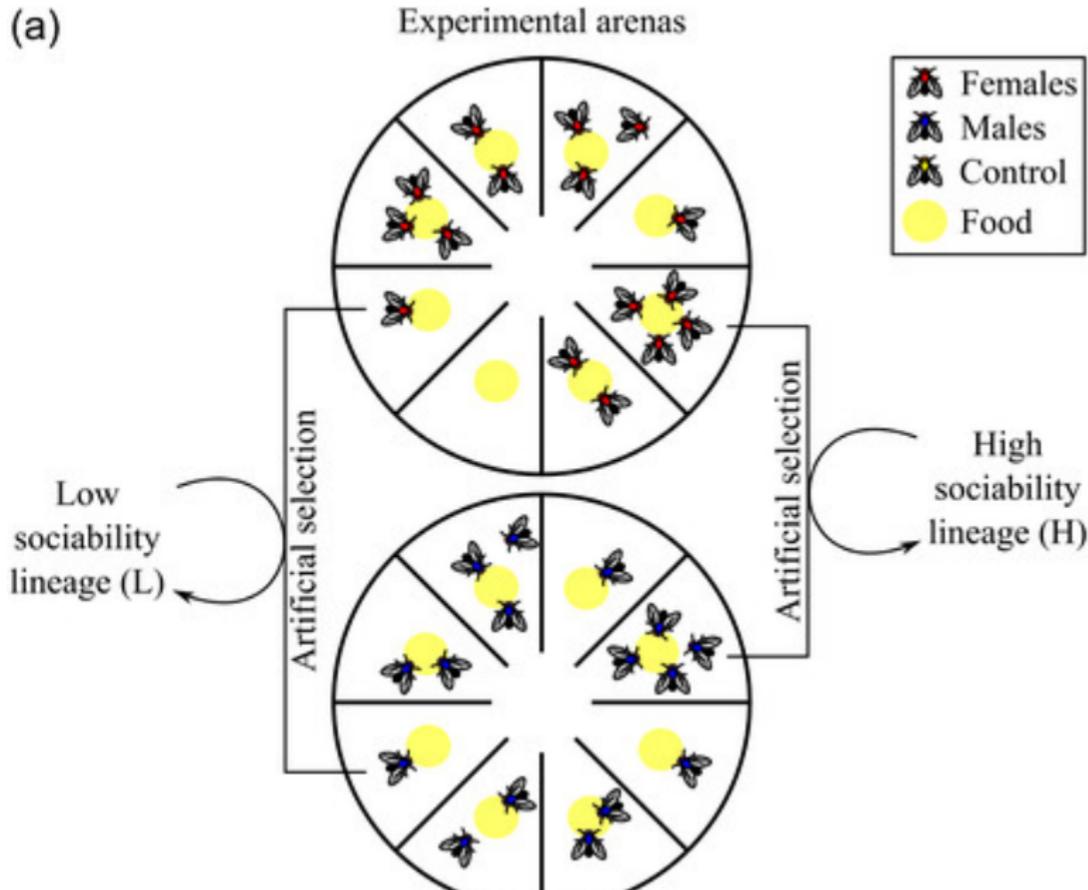


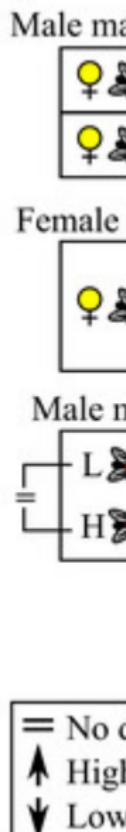
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Sociable fruit flies:

(a)

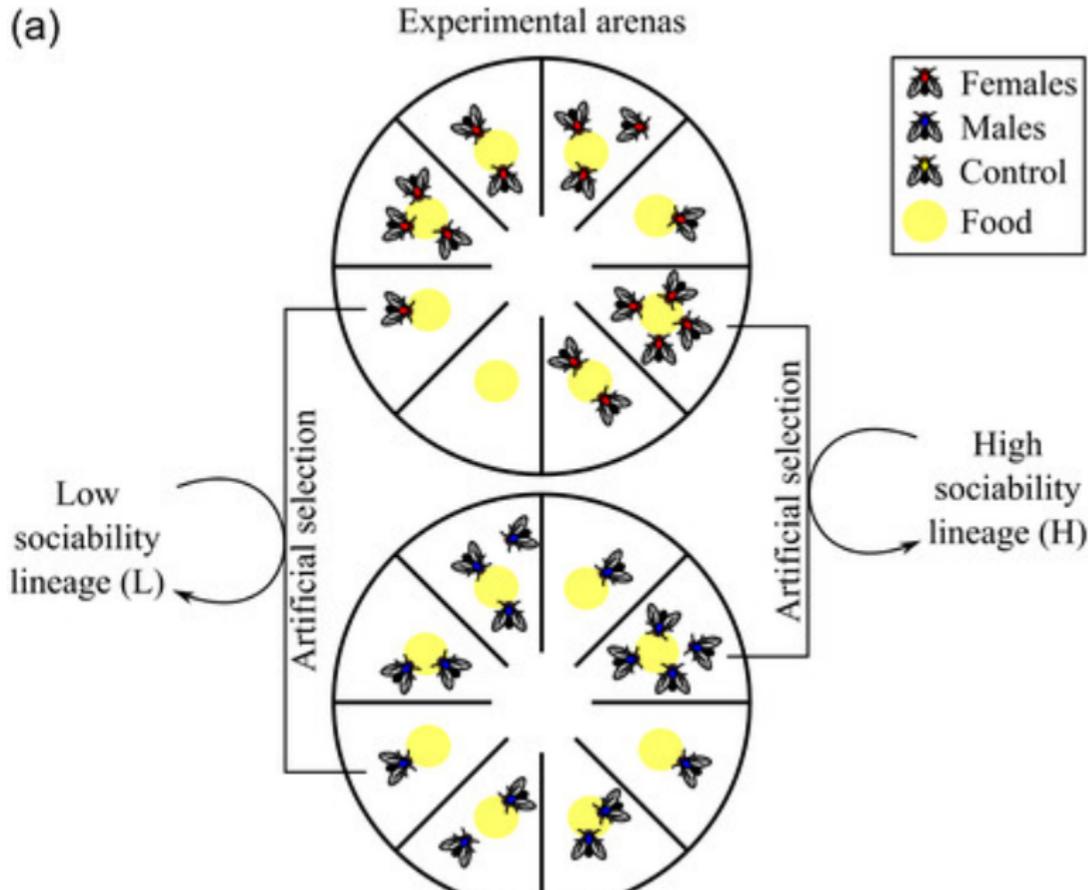


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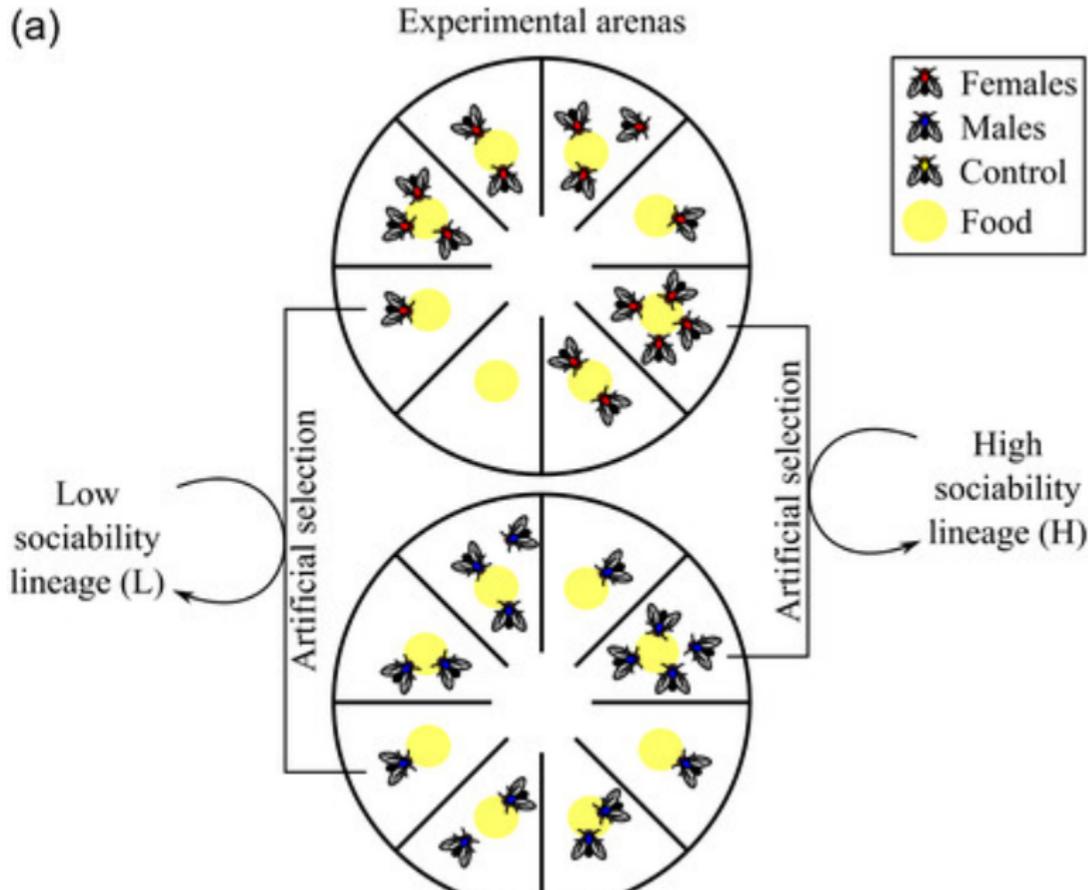


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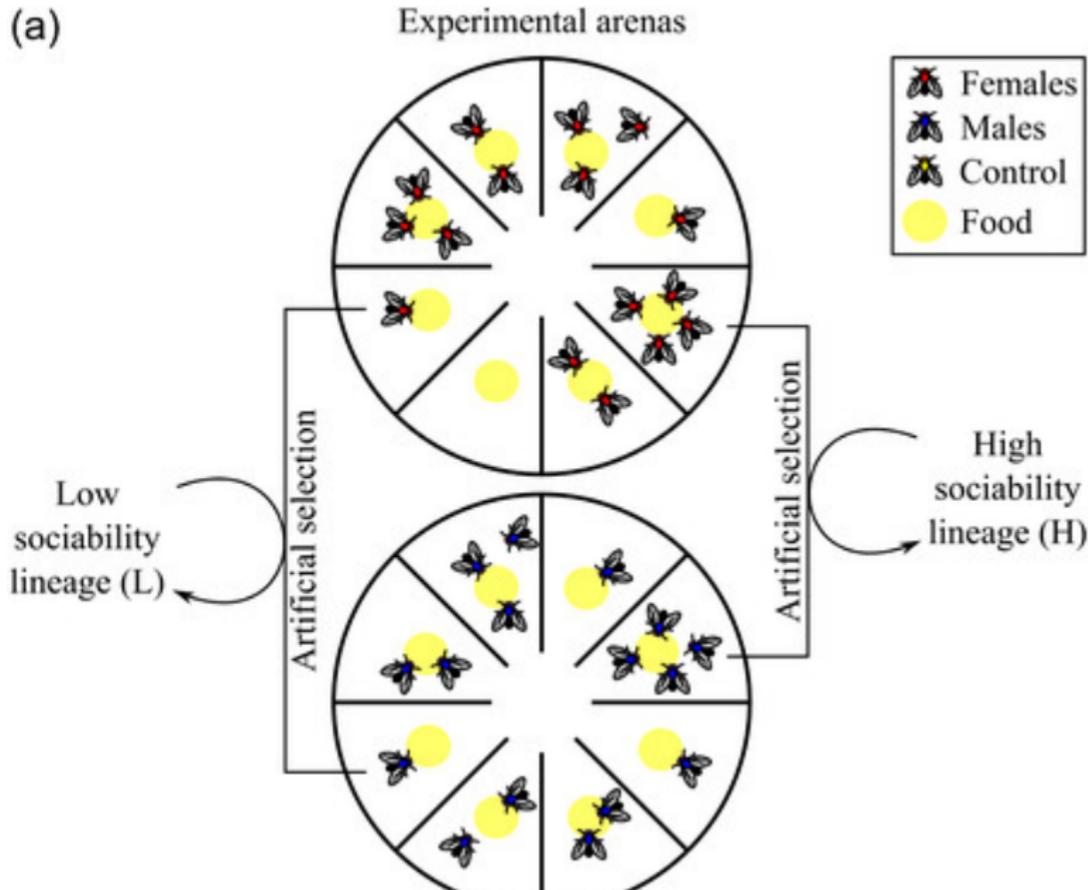


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Geographic relationships

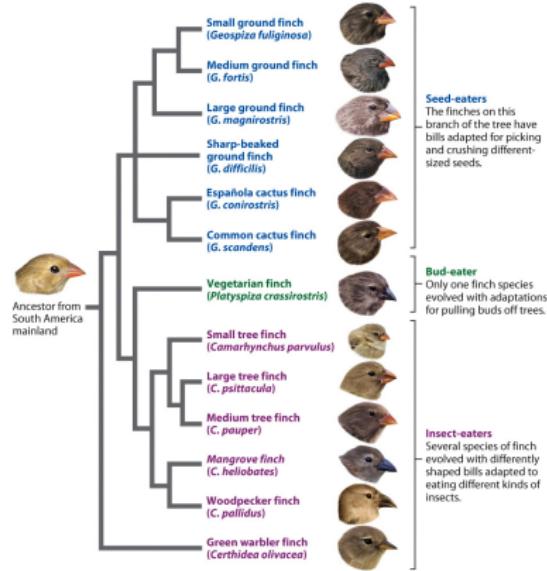


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▶ See book

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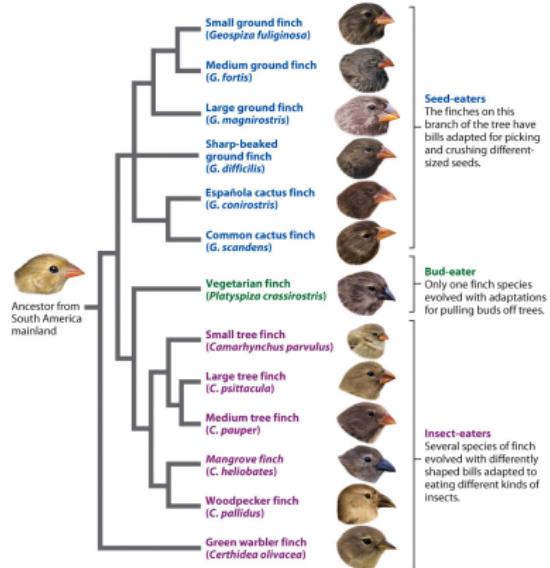


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► See book

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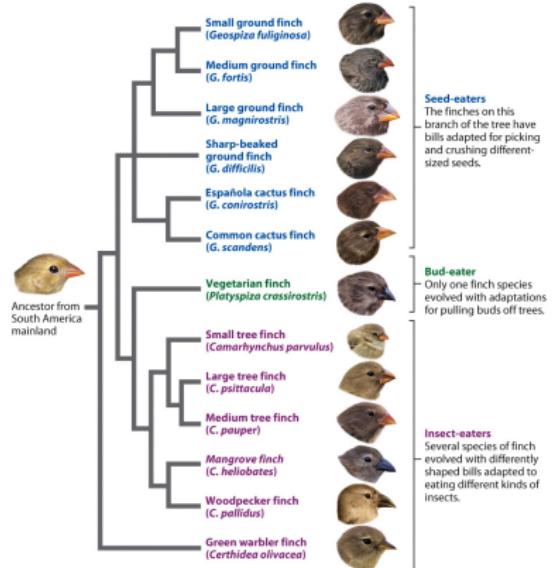


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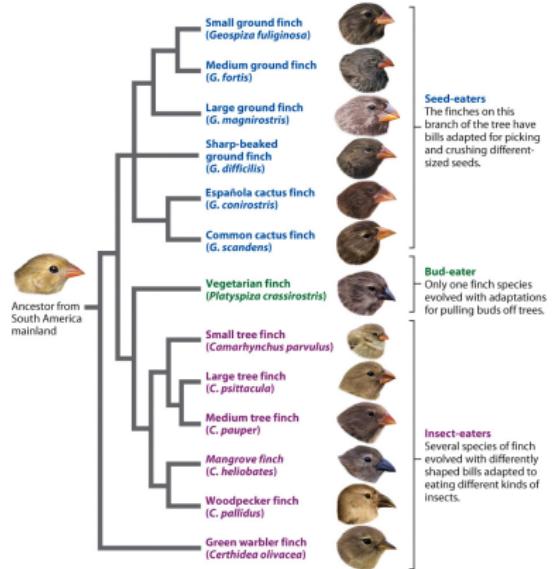


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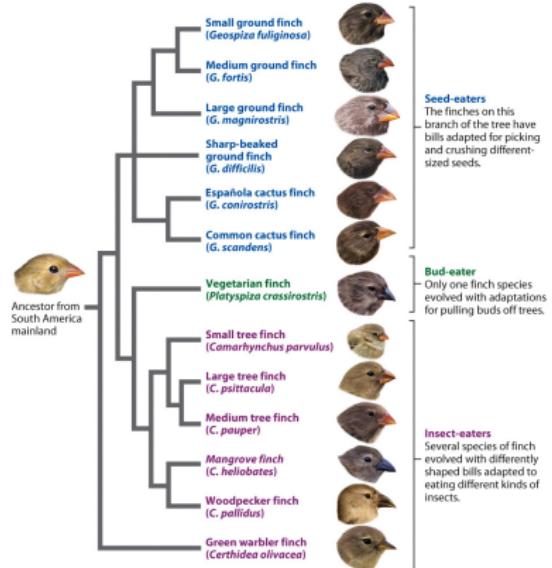


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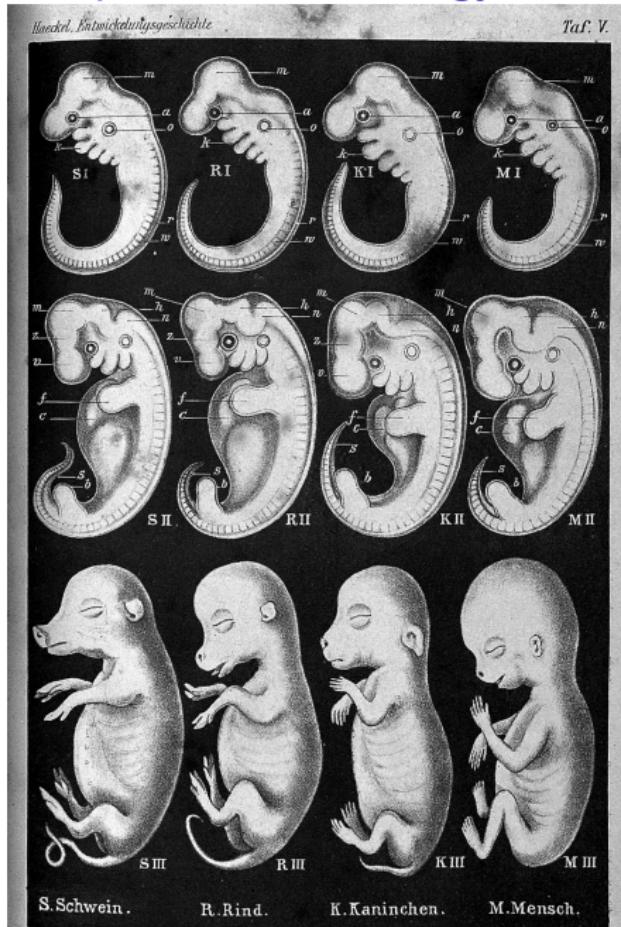
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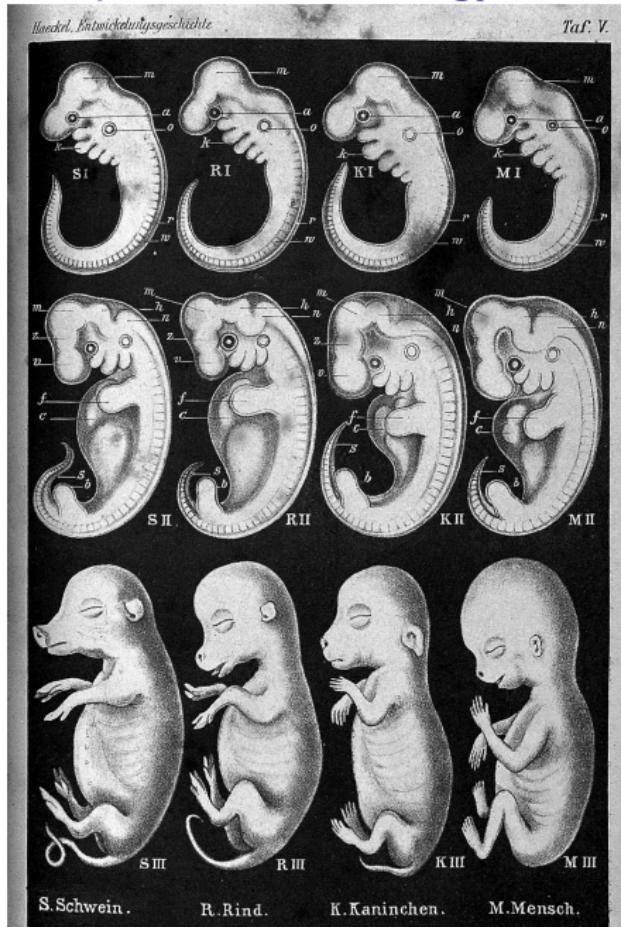
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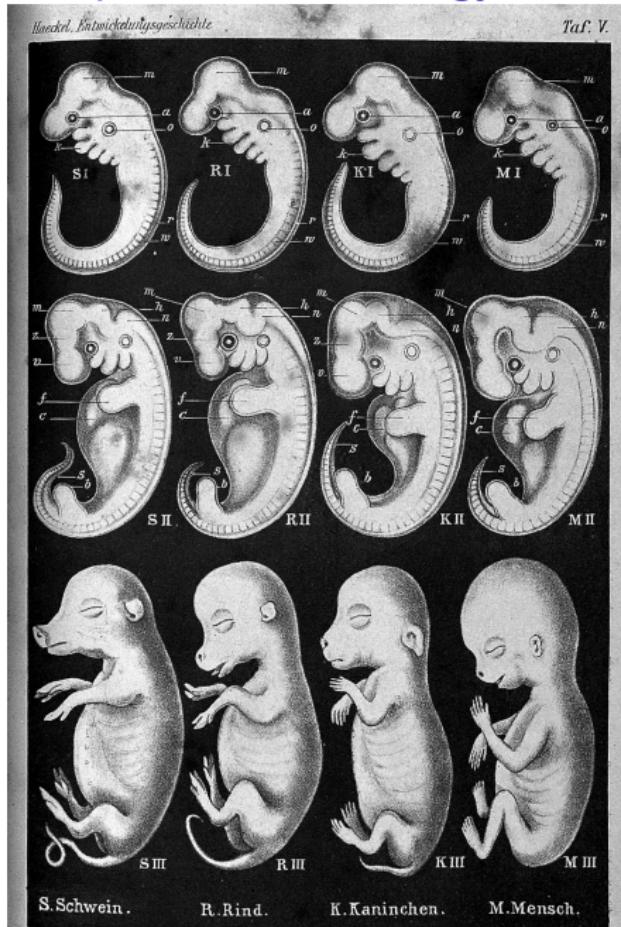
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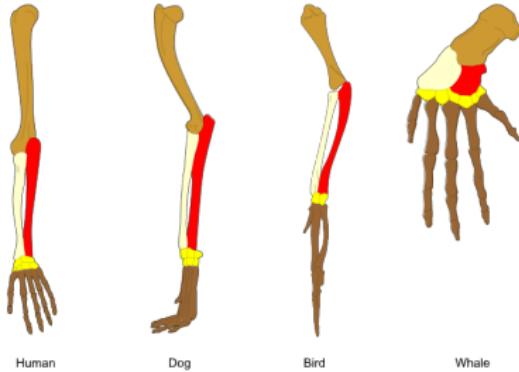
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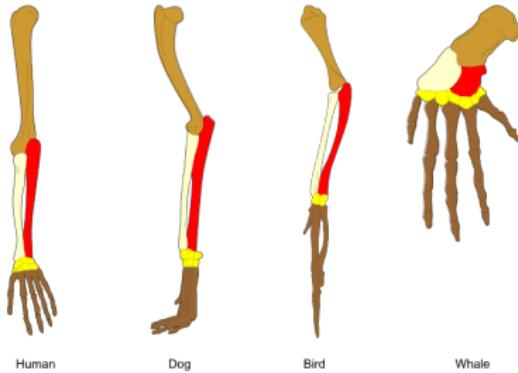
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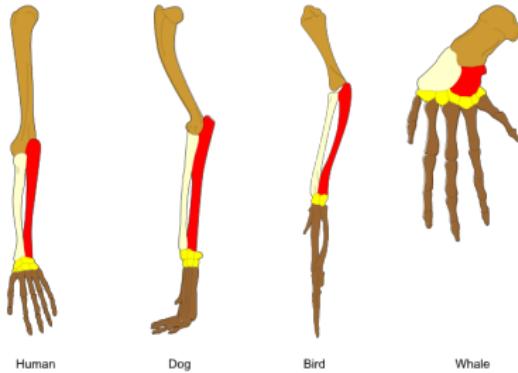
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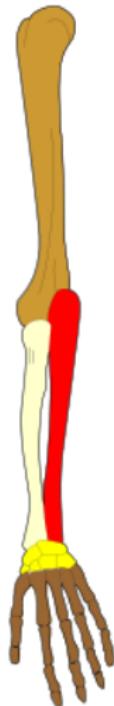
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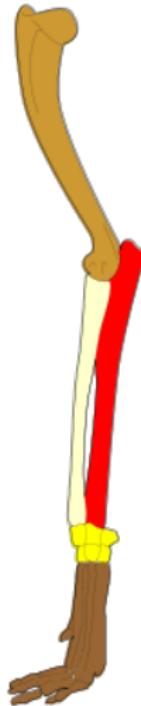


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Natural selection

- ▶ Darwin's big idea was not evolution, but natural selection
- ▶ Natural selection is the way adaptive evolution occurs
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Finch beaks (see textbook)

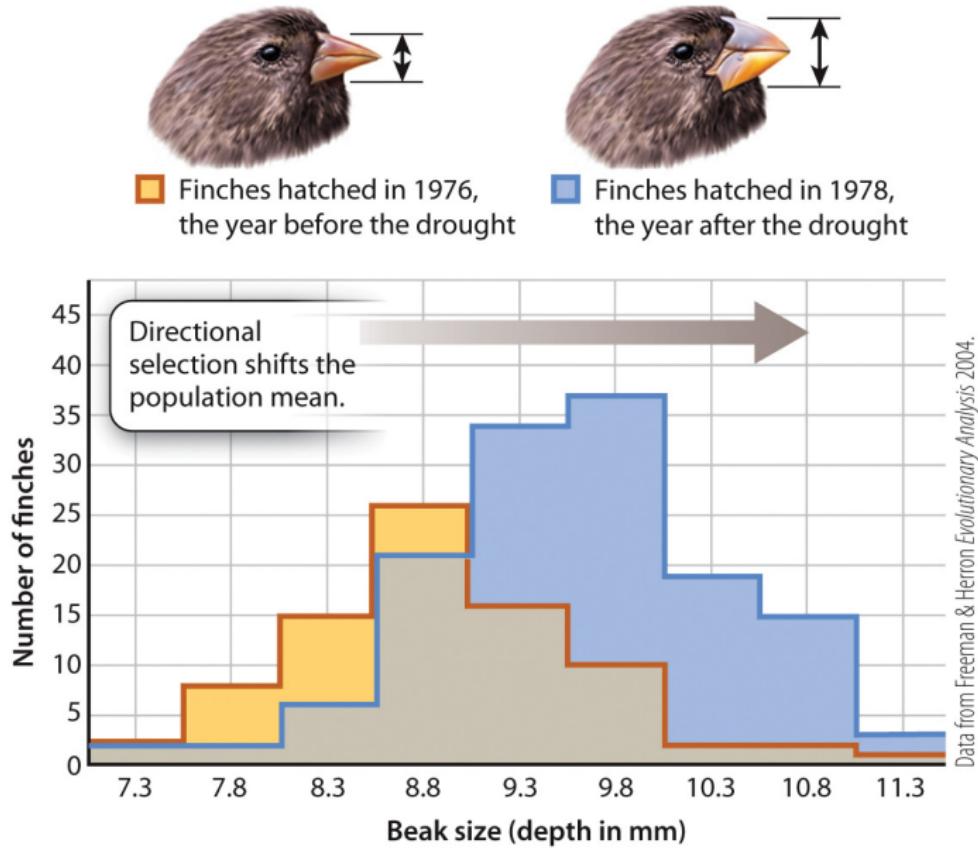


Figure 20.8b
Biology: How Life Works
© Macmillan Learning

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Outline

Evolution

Change through time

Relationships between species

Natural selection

The nature of adaptation

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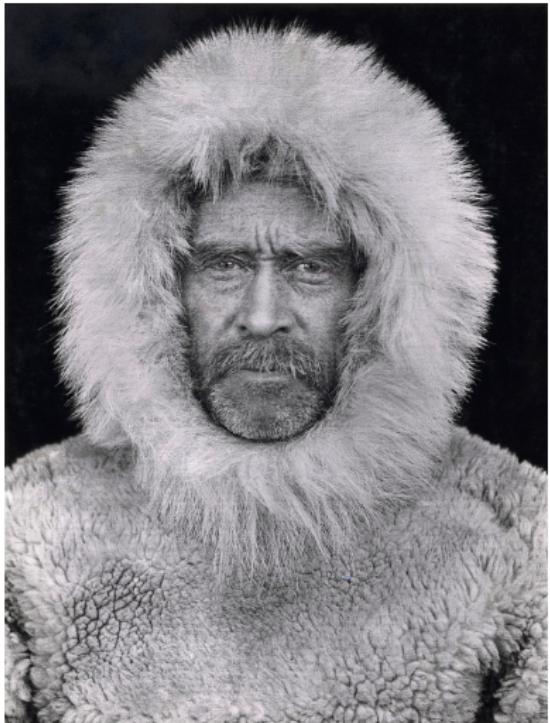
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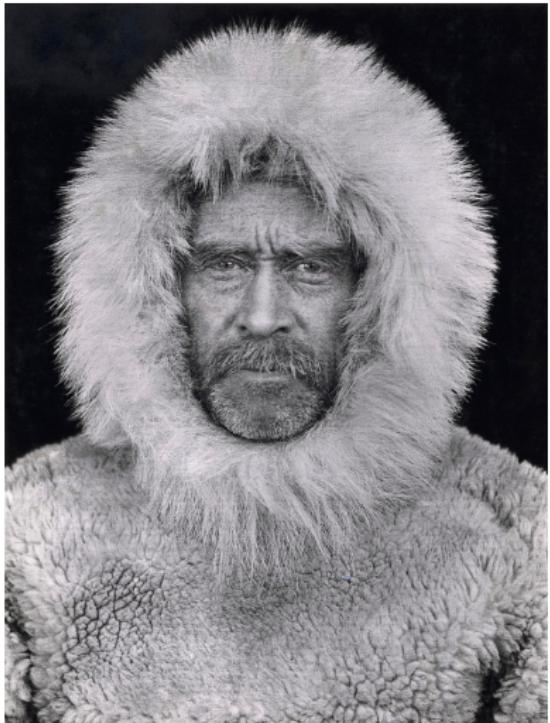
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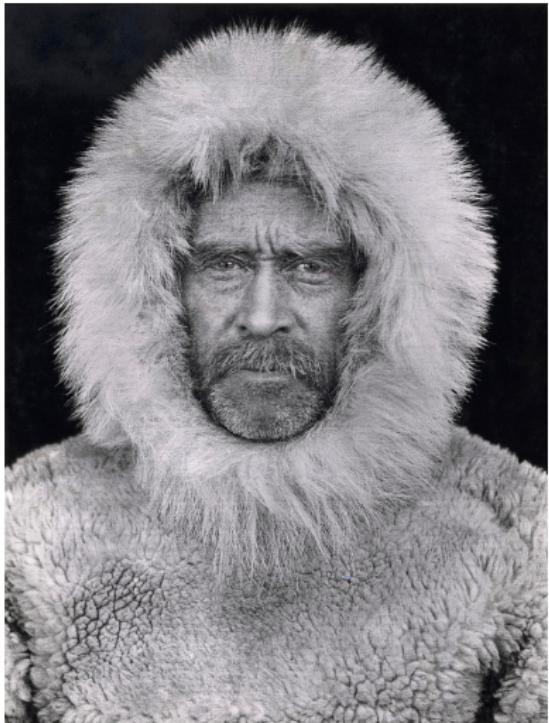


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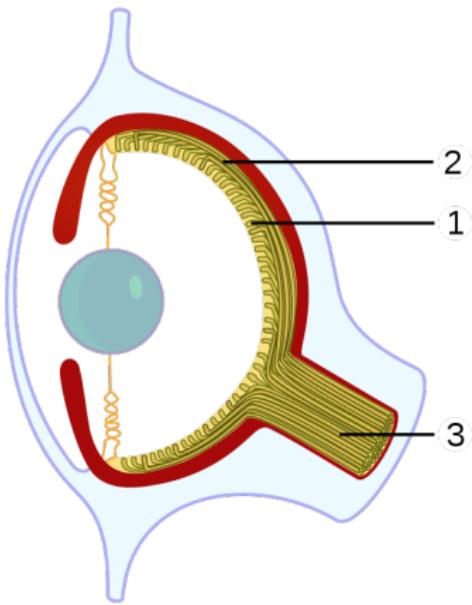
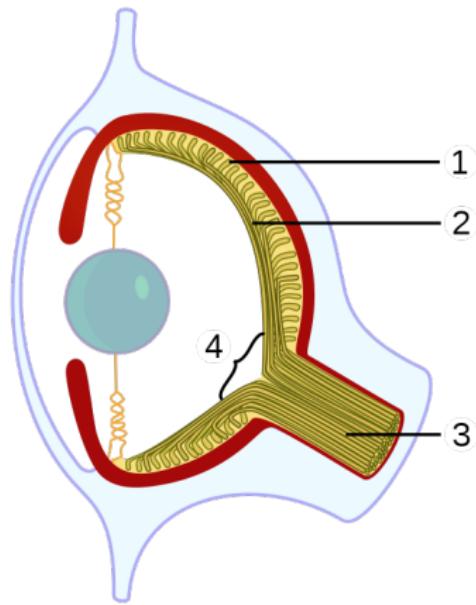
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