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THEORY OF EVOLUTION

Section 15-1: History of Evolutionary Thought

Read the passage below, which covers topics from your textbook. Answer the questions that follow.

Darwin used the phrase *descent with modification* to describe the process of evolution. He carefully reviewed the evidence that every species—living or extinct—must have descended by reproduction from preexisting species and that species must be able to change over time. Darwin was not the first person to put forward the idea of descent with modification, but he was the first to argue that *all* species had descended from only one or a few original kinds of life.

Darwin saw the animals of the Galápagos Islands as evidence of descent with modification. For example, the islands are home to 13 similar species of finches. Each of these bird species has a beak that is best adapted for a certain kind of food. But Darwin suspected that all 13 species descended from and diverged from just a few ancestral finches. These ancestors could have flown to the Galápagos Islands from elsewhere sometime after the islands were formed.

Read each question and write your answer in the space provided.

SKILL: Identifying Main Ideas

1. What is descent with modification as used by Darwin?

_____

_____

2. What evidence supporting Darwin's descent with modification is contained in the passage?

_____

_____

Circle the letter of the phrase that best completes the sentence.

3. According to Darwin's descent with modification, organisms
   - **a.** can exist in only one particular geographic location.
   - **b.** give rise to similar organisms.
   - **c.** do not change over time.
   - **d.** Both (a) and (b)

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SECTION 15-1 REVIEW

HISTORY OF EVOLUTIONARY THOUGHT

VOCABULARY REVIEW Define the following terms.

1. evolution _____

2. natural selection _____

MULTIPLE CHOICE Write the correct letter in the blank.

_____ 1. If Lamarck's hypothesis of species modification were true, the children of a person who developed large muscles by lifting weights would be born with

a. smaller-than-average muscles.
b. normal-sized muscles.
c. normal-sized muscles that would become larger only if the children also lifted weights.
d. larger-than-average muscles.

_____ 2. What is the idea developed by Charles Lyell stating that the geologic processes that shaped Earth in the past continue to operate today?

a. inheritance of acquired characteristics
b. catastrophism
c. uniformitarianism
d. descent with modification

_____ 3. Darwin used the phrase "descent with modification" to mean that

a. new species descended from preexisting species, and species must be able to change over time.
b. organisms that descend from high elevations are modified as they acquire new traits.
c. all living things descended from a recent common ancestor on the Galápagos Islands.
d. individuals modify their behavior to survive and then pass those modifications on to their descendants.

_____ 4. According to Darwin's theory of natural selection,

a. individuals are modified by adverse environmental conditions.
b. the environment affects all organisms in a population in the same way.
c. populations of all organisms grow unchecked under natural conditions.
d. organisms that have more favorable traits tend to leave more offspring.

_____ 5. In an evolutionary sense, an individual organism has high fitness if it

a. has a large number of acquired traits.
b. can run long distances without becoming exhausted.
c. reproduces more successfully than other individuals.
d. evolves into another organism rather than becoming extinct.

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SHORT ANSWER Answer the questions in the space provided.

1. Why are acquired traits not directly related to the process of evolution? _____

2. How did the ideas of Thomas Malthus influence Darwin's thinking about evolution? _____

3. What is the relationship between evolution and natural selection? _____

4. **Critical Thinking** If Lamarck and Darwin had debated why giraffes have such long necks, how would their explanations have differed? _____

STRUCTURES AND FUNCTIONS Use the figure to answer the following question.

Which of the parent birds shown below (*A* or *B*) appears to have greater fitness? Explain your answer.