

1 According to the heterotroph hypothesis, which substance was missing from the environment of the Earth prior to the origin of life?

- A) ammonia molecules
- B) methane molecules
- C) hydrogen molecules

**D) oxygen molecules**

2 The heterotroph hypothesis is an attempt to explain

- A) how the Earth was originally formed
- B) why simple organisms usually evolve into complex organisms
- C) why evolution occurs very slowly

**D) how life originated on the Earth**

3 In an experiment by Stanley Miller, the chemicals methane, hydrogen, ammonia, and water vapor were subjected to a high-energy electrical sparking device at high temperatures. What was the aim of this experiment?

- A) produce organic compounds**
- B) produce elements
- C) duplicate aerobic respiration
- D) duplicate photosynthesis

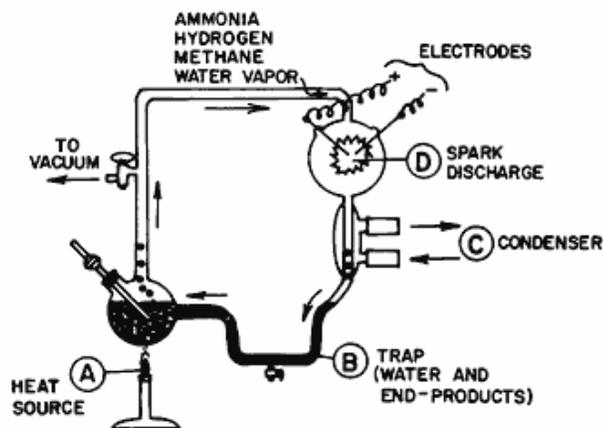
4 The results provided by Stanley Miller's experiments involving a simulated primitive environment, as described in the heterotroph hypothesis, show that in this environment

- A) only inorganic molecules can be synthesized
- B) there is little possibility for the synthesis of complex molecules
- C) organic molecules can be synthesized**
- D) only complex nucleic acid molecules can be synthesized

5 According to the heterotroph hypothesis, which gas was *lacking* in the atmosphere of primitive Earth?

- A) ammonia
- B) hydrogen
- C) methane
- D) oxygen**

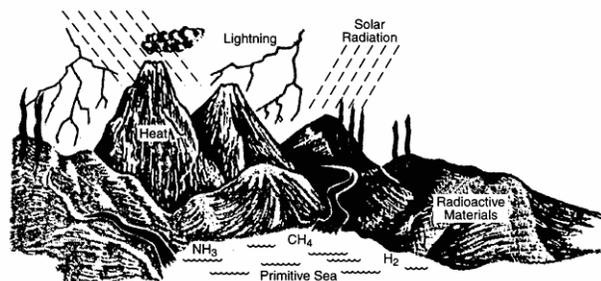
6 The diagram below represents the apparatus used by Stanley Miller to provide experimental evidence to support the heterotroph hypothesis.



In which parts of the setup did he attempt to duplicate the energy sources of the primitive Earth?

- A) *A and D*
- B) *B and C*
- C) *C and A*
- D) *D and B*

7 According to some scientists, what resulted from the environmental conditions existing on primitive Earth illustrated below?



- A) evolution of the first heterotrophs from aggregates of organic molecules**
- B) development of heterotrophic forms of life from plants
- C) migration of vertebrates to cooler portions of Earth
- D) decrease in asexual reproduction in primitive organisms

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8 According to the heterotroph hypothesis, which change contributed most directly to the evolution of aerobic organisms?

- A) **the appearance of organisms able to carry on photosynthesis**
- B) an increase in fermentation by organisms in the soil
- C) a decrease in the intensity of light from the Sun
- D) an increase in the concentration of hydrogen gas in the atmosphere

9 According to the heterotroph hypothesis, autotrophs developed after the evolution of heterotrophs partly because the primitive environment of the Earth *lacked*

- A) methane                      B) water
- C) **carbon dioxide**      D) solar radiation

10 Many scientists suggest that billions of years ago, life on Earth began with

- A) **simple, single-celled organisms**
- B) simple, multicellular organisms
- C) complex, single-celled organisms
- D) complex, multicellular organisms

11 According to the heterotroph hypothesis, some early heterotrophs evolved into autotrophs because of their ability to synthesize organic compounds from water and

- A) **carbon dioxide**
- B) hydrochloric acid
- C) oxygen
- D) hydrogen

12 One widely accepted theory states that the first forms of life were heterotrophs. Later, some organisms developed the ability to use atmospheric carbon dioxide to produce organic nutrients. Organisms with this capability represented the evolution of the first

- A) herbivores                      B) carnivores
- C) decomposers                  D) **autotrophs**

13 Which statement is part of the heterotroph hypothesis?

- A) **Heterotrophs evolved before autotrophs.**
- B) Aerobes evolved before anaerobes.
- C) Atmospheric oxygen was present before carbon dioxide.
- D) Proteins were present before amino acids.

14 According to the heterotroph hypothesis, extended periods of autotrophic activity eventually added a gas to the atmosphere of the primitive Earth that had not been present before. The addition of this gas made possible the evolution of the process of

- A) **aerobic respiration**
  - B) photosynthesis
  - C) anaerobic respiration
  - D) fermentation
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**Answer Key**  
**Origin of Life**

- 1 **D**
  - 2 **D**
  - 3 **A**
  - 4 **C**
  - 5 **D**
  - 6 **A**
  - 7 **A**
  - 8 **A**
  - 9 **C**
  - 10 **A**
  - 11 **A**
  - 12 **D**
  - 13 **A**
  - 14 **A**
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