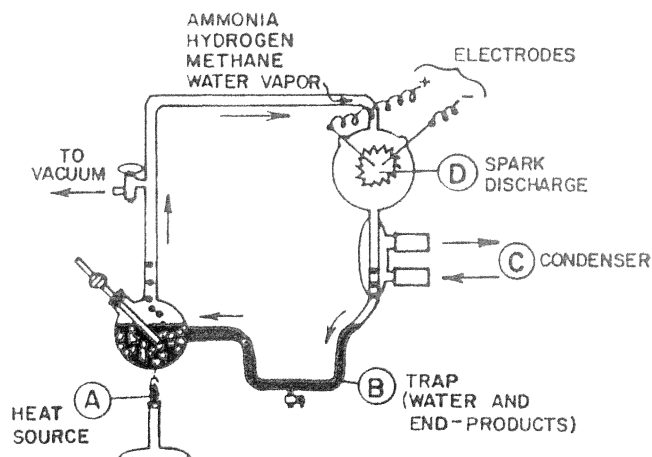


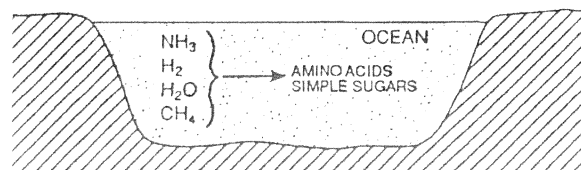
- A heterotroph that is aerobic can best be described as one that
 - does not use free O_2 for respiration, but can manufacture its own food
 - does not use free O_2 for respiration, and cannot manufacture its own food
 - uses free O_2 for respiration, but cannot manufacture its own food
 - uses free O_2 for respiration, and can manufacture its own food
- The heterotroph hypothesis is an attempt to explain
 - why evolution occurs very slowly
 - why simple organisms usually evolve into complex organisms
 - how life originated on the Earth
 - how the Earth was originally formed
- The first life-forms to appear on Earth were most likely
 - complex single-celled organisms
 - complex multicellular organisms
 - simple single-celled organisms
 - simple multicellular organisms
- Which statement is part of the heterotroph hypothesis?
 - Aerobes evolved before anaerobes.
 - Atmospheric oxygen was present before carbon dioxide.
 - Heterotrophs evolved before autotrophs.
 - Proteins were present before amino acids.
- According to the heterotroph hypothesis, which gas was *lacking* in the atmosphere of primitive Earth?
 - oxygen
 - methane
 - hydrogen
 - ammonia

- 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?

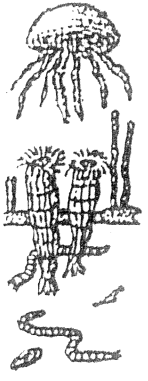


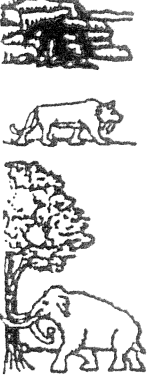
- A and D
 - B and C
 - C and A
 - D and B
- The diagram below illustrates a stage described in the heterotroph hypothesis.



The process indicated by the arrow most likely required

- protists and monerans
- heat and solar radiation
- autotrophic organisms
- aerobic organisms

8. Information related to the organisms found on Earth during various geological time periods is represented in the chart below.

Common Organisms				
	Time 4.6 (?) Billion Years Ago	600 Million Years Ago	200 Million Years Ago	60 Million Years Ago
	Era Precambrian (Simple Multicellular Organisms and First Protists)	Paleozoic (Age of Amphibians, Fishes, and Invertebrates)	Mesozoic (Age of Reptiles)	Cenozoic (Age of Mammals)
Past		Geologic Time		Present

Which statement concerning the first appearance of the organisms over the time period represented in this chart is most likely correct?

- 1) Life on Earth has changed rapidly.
- 2) Life on Earth has changed from primitive organisms to more complex organisms.
- 3) Life on Earth began with complex organisms and changed to more complex organisms.
- 4) Life on Earth has remained the same.

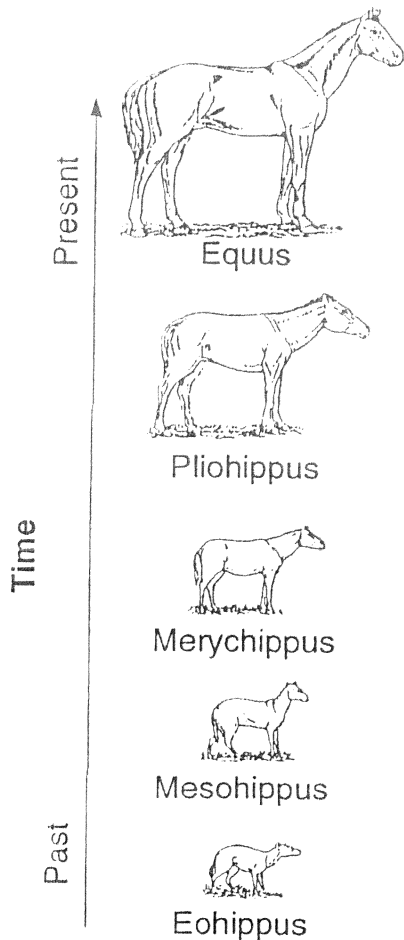
9. Which is an example of evolution?

- 1) development of the modern horse from earlier horse species
- 2) germination of a 100-year-old spore when moistened
- 3) replacement of a lost claw of a lobster
- 4) development of muscle tissue from embryonic mesoderm

10. Which area of biology compares and attempts to explain the structural changes that have taken place in living things over millions of years, as well as those changes occurring today?

- 1) evolution
- 2) physiology
- 3) reproduction
- 4) classification

11. The diagram below shows the gradual change over time in the anatomy of the horse.



Which concept is best illustrated by the physical variations in the horse as its body size and structure change over time?

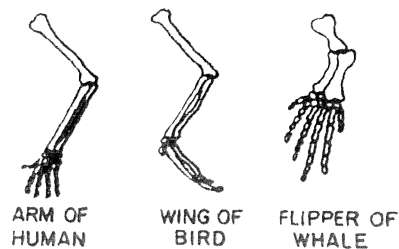
- 1) organic evolution
- 2) acquired characteristics
- 3) intermediate inheritance
- 4) artificial selection

12. The diagrams below show embryos of three different vertebrate species.



According to one theory, similarities in these embryos suggest common ancestry. As these embryos mature, they will most likely

- 1) develop the distinctive characteristics of their species
 - 2) develop new organs according to the nutritional requirements of each organism
 - 3) show no similarity as adults
 - 4) continue to closely resemble each other as adults
13. Which type of evolutionary evidence is represented by these diagrams below?

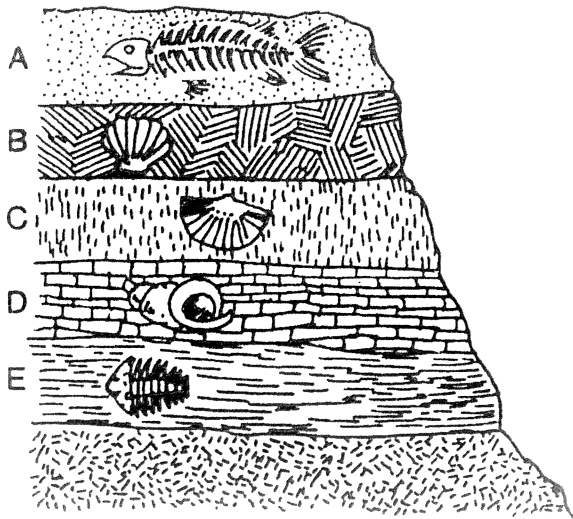


- 1) physiological likenesses
- 2) homologous structures
- 3) biochemical similarities
- 4) geographic distribution

14. Organism *X* appeared on Earth much earlier than organism *Y*. Many scientists believe organism *X* appeared between 3 and 4 billion years ago, and organism *Y* appeared approximately 1 billion years ago. Which row in the chart below most likely describes organisms *X* and *Y*?

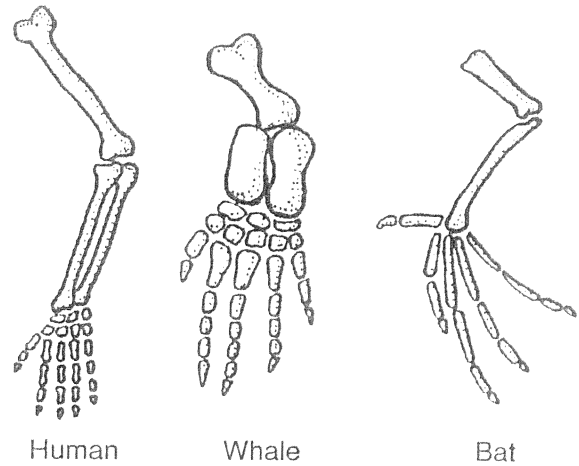
Row	Organism X	Organism Y
(1)	simple multicellular	unicellular
(2)	complex multicellular	simple multicellular
(3)	unicellular	simple multicellular
(4)	complex multicellular	unicellular

15. In the diagram below of undisturbed sedimentary rock strata, in which rock layer are the fossils of more complex animals generally found?



- 1) A
- 2) B
- 3) E
- 4) D

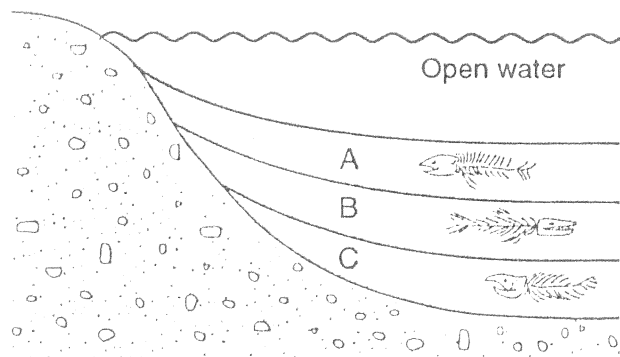
16. The diagrams below show the bones in the forelimbs of three different organisms.



Differences in the bone arrangements support the hypothesis that these organisms

- 1) have adaptations to survive in different environments
 - 2) all contain the same genetic information
 - 3) may have descended from the same ancestor
 - 4) are members of the same species
17. Biologically similar organisms have similar DNA and proteins. This statement supports the concept of
- 1) use and disuse
 - 2) diversity in species
 - 3) acquired characteristics
 - 4) organic evolution

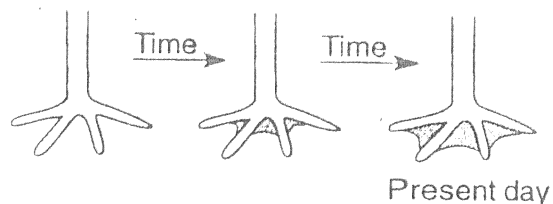
18. The diagram below illustrates the distribution of fossils in undisturbed layers of silt at the bottom of the ocean.



Which inference can correctly be made from the diagram?

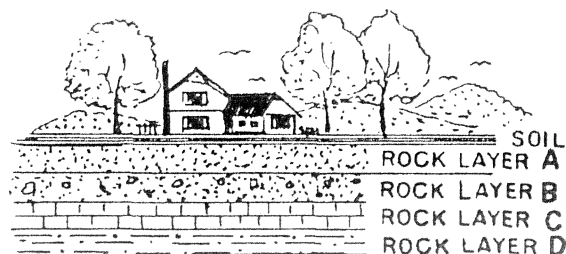
- 1) The fossils in layer *A* are older than those in layer *C*.
- 2) The fossils in layer *A* are older than those in layer *B*.
- 3) The fossils in layer *C* are older than those in layer *A*.
- 4) The fossils in layer *B* are older than those in layer *C*.

19. The changes in foot structure in a bird population over many generations are shown in the diagram below.



These changes can best be explained by the concept of

- 1) use and disuse
 - 2) extinction
 - 3) evolution
 - 4) stable gene frequencies
20. A geologist finds fossils in each of the undisturbed rock layers represented in the diagram below. The fossils are all structurally similar. Which is the most likely conclusion that the geologist would make?



- 1) The fossils in rock layer *B* are older than those in layer *C*.
- 2) The fossils in rock layer *D* are older than those in layer *A*.
- 3) All the fossils are of the same age.
- 4) The relative ages of the fossils cannot be determined.

