PASSAGE TWO (Questions 9–16)

Paragraph

Limestone Caves

1▶ Caves, natural cavities formed within the earth, can be formed from varied substances, but the largest caves, measured by depth and length, are commonly created out of limestone. Limestone primarily derives from the hard outer shells of marine organisms, and was originally formed on ancient sea beds or at the bottom of oceans. Limestone caves are known as "solutional" caves since the limestone is dissolved, opening up a slowly expanding hole, which results in the creation of the cave. These caves can be spectacular structures filled with giant stalactites and stalagmites.

2▶ Limestone caves are formed in one of two ways. For a long time, it was accepted that all the caves were made by rainwater, a weak acid, when it dissolves calcite, or lime, out of limestone. Carbonic acid is formed when the rainwater combines with atmospheric carbon dioxide. Over time, the acid-laden water drips down into cracks, enlarging them into caves. However, more recently, it was revealed that some well-known caves, including the Carlsbad Caverns in New Mexico, were not formed by carbonic acid, but instead, by sulfuric acid. Apparently, microorganisms far beneath the earth's surface consume oil and generate hydrogen sulfide. This hydrogen sulfide mixture rises to the earth's surface and mixes with water, producing the sulfuric acid that eats away at the limestone. Thus, both methods involve water combining with another substance to form an acid that erodes the limestone, creating the caves.

3▶ Regardless of which type of acid initiates the erosion process, the liquid substances carry the dissolved limestone particles to other parts of the caves and deposit them. These deposits become "speleothems," the structures that grow from the floors and ceilings, and cover the walls of the caves. These deposits can also form structures known as stalactites and stalagmites. All of the formations are created as the water evaporates on the surfaces of the cave, leaving behind the solid limestone grains that build up and create often unique and eye-catching shapes.

4▶ Stalactites, which extend down from cave ceilings, are formed in limestone caves when groundwater containing dissolved lime drips from the roof of the cave and leaves a thin deposit as it evaporates. Stalactites generally grow only a fraction of an inch each year, but over time a considerable number may grow to be several yards long. In cases where the supply of water is seasonal, they may actually have growth rings resembling those on tree trunks that indicate how old the stalactites are.

5▶ Stalagmites are formed on the floor of a limestone cave where water containing dissolved lime has dripped either from the cave ceiling or from a stalactite above. They develop in the same way as stalactites, when water containing dissolved limestone evaporates. The deposits of limestone gradually build up over hundreds or thousands of years. One of the tallest stalagmites, the Great Dome in Carlsbad Cavern, is over 67 feet (21 meters) high. Using currently accepted growth-rate calculations, it is estimated that the stalagmite reached this height in just under 4,000 years.

6▶ In some limestone caves with mature limestone development, stalactites and stalagmites grow together, creating limestone pillars that stretch from the cave floor to the cave ceiling. These pillars are referred to as "columns" due to their resemblance to the manmade structures used to support the roofs and ceilings of buildings. The growth rate of stalagmites and stalactites has proven difficult to measure with any consistency, making it hard to predict when the formations with the possibility of merging into columns might actually do so.

7▶ A fourth type of speleothem is called flowstone. Flowstone forms as the water flows or drips down the walls of a cave, leaving behind the limestone sediment. Flowstone, while having an irregular surface, develops much more smoothly and evenly than stalagmites and stalactites because of the large area that the water has to flow over.

8▶ In some caves, experts have determined that a lack of moisture will prevent further growth of the formations, while in others, rates of growth have varied depending on the amount of moisture and the speed of dripping or flowing water. While the growth rate of the cave formations is virtually imperceptible from one year to the next, an evaluation of thousands of years worth of data give scientists the ability to estimate a yearly growth rate. In some caves, these estimations may take decades to confirm, and in others, they may never be validated since the dry conditions of those caves today hinder further growth of the structures.

9. Paragraph 1 states all of the following about caves EXCEPT

Ⓐ most caves, of all sizes, are made of limestone
Ⓑ caves are measured by how deep and how long they are
Ⓒ they are natural holes created in the earth
Ⓓ they can be formed from different substances

10. It is indicated in paragraph 2 that all of the following are part of the process of forming limestone caves EXCEPT that

Ⓐ rainwater dissolves lime from limestone
Ⓑ the acidic water seeps into breaks in the ground
Ⓒ the lime in the water evaporates
Ⓓ the cracks in the ground develop into caves

11. Which of the following is NOT true about speleothems?

Ⓐ They are made from limestone particles.
Ⓑ They cover only the floors and ceilings of the caves.
Ⓒ They include stalactites and stalagmites.
Ⓓ They create unusual and interesting formations.

12. According to paragraph 4, it is NOT true that stalactites

Ⓐ enlarge cave ceilings
Ⓑ are found in limestone caves
Ⓒ grow in a downward direction
Ⓓ grow quite slowly

13. It is NOT mentioned in paragraph 4

Ⓐ how long stalactites may grow
Ⓑ how the age of a stalactite is determined
Ⓒ what one of the effects of a limited water supply is
Ⓓ what causes stalactites to disappear

14. What is NOT true about stalagmites?

Ⓐ They are formed by the same method as stalactites.
Ⓑ They grow in the same direction as stalactites.
Ⓒ They can join a stalactite to form a single structure.
Ⓓ Some stalagmites have grown over thousands of years.

15. Which of the following is NOT a speleothem?

Ⓐ a stalagmite
Ⓑ a stalactite
Ⓒ a limestone grain
Ⓓ a flowstone

16. What is NOT mentioned in paragraph 8 about moisture and its relationship to speleothems?

Ⓐ The pace of growth depends on the amount of moisture.
Ⓑ Without moisture, the formations will not grow.
Ⓒ A lack of moisture has sped up the formation of speleothems.
Ⓓ The growth rate of speleothems is hard to determine in caves that have dried up.