

THE GEOLOGIC HISTORY OF THE MEDITERRANEAN

READING PRACTICE SETS

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TOEFL iBT READING PRACTICE SET

Directions: Read the passage and answer the questions. Give yourself 18 minutes to complete this practice set.

THE GEOLOGIC HISTORY OF THE MEDITERRANEAN

1 In the summer of 1970, geologists Kenneth J. Hsu and William B. F. Ryan were collecting research data as part of the Deep Sea Drilling Project while aboard the oceanographic research vessel *Glomar Challenger*. An objective of this particular cruise was to investigate the floor of the Mediterranean and to resolve questions about its geologic history. One question was related to evidence that the invertebrate fauna of the Mediterranean changed abruptly about 6 million years ago. Most of the older organisms were nearly wiped out, although a few hardy species survived. A few managed to migrate into the Atlantic. Somewhat later, the migrants returned, bringing new species with them. Why did the near extinction and migrations occur?

2 [A] Another task for the *Glomar Challenger's* scientists was to try to determine the origin of the domelike masses buried deep beneath the Mediterranean seafloor. [B] These structures had been detected years earlier by echo-sounding instruments, but they had never been penetrated in the course of drilling. [C] Were they salt domes like those that are common along the United States Gulf Coast, and if so, why should there have been so much solid crystalline salt beneath the floor of the Mediterranean? [D]

3 With questions such as these clearly before them, the scientists aboard the *Glomar Challenger* proceeded to the Mediterranean to search for the answers. On August 23, 1970, they recovered a remarkable sample consisting of pebbles of hardened sediment that had once been soft, deep-sea mud, as well as granules of gypsum, a mineral made of calcium sulfate and water commonly formed by the evaporation of seawater, and fragments of volcanic rock. However, not a single pebble was found that might have indicated that the pebbles came from the nearby continent. In the days following, samples of solid gypsum were repeatedly brought on deck as drilling operations penetrated the seafloor. Furthermore, the gypsum was found to possess peculiarities of composition and structure that suggested that it had formed by evaporation on desert flats. Sediment above and below the gypsum layer, though, contained tiny marine fossils, indicating not a desert-like environment, but normal open-ocean conditions. As they drilled into the central and deepest part of the Mediterranean basin, the scientists took solid, shiny, crystalline salt from the core barrel. Interbedded with the salt were thin layers of what appeared to be windblown silt.

4 The time had come to formulate a hypothesis. The investigators theorized that about 20 million years ago, the Mediterranean was a broad seaway linked to the Atlantic by two narrow straits, like the present Strait of Gibraltar. Crustal movements closed the straits, and the landlocked Mediterranean began to evaporate and shrink. Increasing salinity caused by the evaporation resulted in the extermination of scores of marine species. Only a few organisms especially tolerant of very salty conditions remained. As evaporation continued, the remaining brine became so saturated that the calcium sulfate of the hard layer was precipitated. In the central, deeper part of the basin, the last of the brine evaporated to precipitate more soluble sodium chloride, which is the chemical name for salt. The dried-up Mediterranean became a vast desert 3,000 meters deep. Then, about 5.3 million years ago, came the so-called Zanclean deluge, which may have continued for several years. As a result of crustal adjustments and faulting, the Strait of Gibraltar, where the Mediterranean Sea now connects to the Atlantic, opened, and water cascaded spectacularly back into the Mediterranean. Turbulent waters tore into the hardened salt flats, broke them up, and ground them into the pebbles observed in the first sample taken by the *Glomar Challenger*. As the basin refilled, marine organisms returned, mostly migrants from the Atlantic. Soon afterwards, layers of oceanic ooze began to accumulate above the old hard layer. Long after the Mediterranean basin was refilled, under the weight of overlying sediments, the salt flowed plastically upward to form salt domes like those along the United States Gulf Coast.

5 The deposits of salt and gypsum, the faunal changes, and the unusual pebbly sediment provided abundant evidence that the Mediterranean was once a desert. The hypothesis has survived critical examination and is on its way to being accepted as a rigorous theory.

1. Which of the following is NOT mentioned in paragraph 1 as a change that occurred in the Mediterranean's fauna?
 - (A) Most invertebrate species disappeared during a wave of extinctions.
 - (B) A few hardy species wiped out many of the Mediterranean's invertebrates.
 - (C) Some invertebrates migrated to the Atlantic Ocean.
 - (D) New species of fauna populated the Mediterranean when the old migrants returned.

2. What does the author imply by saying that not a single pebble was found that might have indicated that the pebbles came from the nearby continent?
 - (A) The most obvious explanation for the origin of the pebbles was not supported by the evidence.
 - (B) The geologists did not find as many pebbles as they expected.
 - (C) The geologists were looking for a particular kind of pebble.
 - (D) The different pebbles could not have come from only one source.

3. Select the TWO answer choices from paragraph 3 that identify materials discovered in the deepest part of the Mediterranean basin. To receive credit, you must select TWO answers.
 - (A) Volcanic rock fragments
 - (B) Thin silt layers
 - (C) Soft, deep-sea mud
 - (D) Crystalline salt

4. What is the main purpose of paragraph 3?
 - (A) To describe the physical evidence collected by Hsu and Ryan
 - (B) To explain why some of the questions posed earlier in the passage could not be answered by the findings of the *Glomar Challenger*
 - (C) To evaluate techniques used by Hsu and Ryan to explore the sea floor
 - (D) To describe the most difficult problems faced by the *Glomar Challenger* expedition

5. According to paragraph 4, which of the following was responsible for the evaporation of the Mediterranean's waters?
 - (A) The movements of Earth's crust
 - (B) The accumulation of sediment layers
 - (C) Changes in the water level of the Atlantic Ocean
 - (D) Changes in Earth's temperature

6. The word scores in the passage is closest in meaning to
 - (A) members
 - (B) large numbers
 - (C) populations
 - (D) different types

7. According to paragraph 4, what caused most species in the Mediterranean to become extinct?
 - (A) The evaporation of chemicals necessary for their survival
 - (B) Crustal movements that connected the Mediterranean to the saltier Atlantic
 - (C) The migration of new species through the narrow straits
 - (D) Their inability to tolerate the increasing salt content of the Mediterranean

8. Which of the sentences below best expresses the essential information in the highlighted sentence in paragraph 4? Incorrect choices change the meaning in important ways or leave out essential information.
- (A) The Strait of Gibraltar reopened when the Mediterranean Sea and the Atlantic Ocean became connected and the cascades of water from the ocean to the sea caused crustal adjustments and faulting.
- (B) The Mediterranean Sea was dramatically refilled by water from the Atlantic when crustal adjustments and faulting opened the Strait of Gibraltar, the place where the two bodies of water are joined.
- (C) The cascades of water from the Atlantic Ocean to the Mediterranean Sea were not as spectacular as the crustal adjustments and faulting that occurred when the Strait of Gibraltar was connected to those bodies of water.
- (D) As a result of crustal adjustments and faulting and the creation of the Strait of Gibraltar, the Atlantic Ocean and the Mediterranean Sea were connected and became a single body of water with spectacular cascades of water between them.
9. Look at the four squares [A-D] that indicate where the following sentence could be added to the passage.

Thus, scientists had information about the shape of the domes but not about their chemical composition and origin.

Where would the sentence best fit?

10. **Directions:** An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the **THREE** answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. **This question is worth 2 points.**

An expedition to the Mediterranean answered some long-standing questions about the sea's history.

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Answer Choices

- (A) The *Glomar Challenger* expedition investigated changes in invertebrate fauna and some unusual geologic features.
- (B) Researchers collected fossils to determine which new species migrated from the Atlantic with older species.
- (C) Scientists working aboard the oceanographic research vessel *Glomar Challenger* were the first to discover the existence of domelike masses underneath the seafloor.
- (D) Samples recovered from the expedition revealed important differences in chemical composition and fossil distribution among the sediment layers.
- (E) Evidence collected by the *Glomar Challenger* supports geologists' beliefs that the Mediterranean Sea had evaporated and become a desert before it refilled with water.
- (F) Mediterranean salt domes formed after crustal movements opened the straits between the Mediterranean and the Atlantic, and the Mediterranean refilled with water.