tpo_15_passage_2

Cases in which many species become extinct within a geologically short interval of time are called mass extinctions. There was one such event at the end of the Cretaceous period around 70 million years ago. There was another, even larger, mass extinction at the end of the Permian period around 250 million years ago. The Permian event has attracted much less attention than other mass extinctions because mostly unfamiliar species perished at that time. The fossil record shows at least five mass extinctions in which many families of marine organisms died out. The rates of extinction happening today are as great as the rates during these mass extinctions. Many scientists have therefore concluded that a sixth great mass extinction is currently in progress. What could cause such high rates of extinction? There are several hypotheses, including warming or cooling of Earth, changes in seasonal fluctuations or ocean currents, and changing positions of the continents. Biological hypotheses include ecological changes brought about by the evolution of cooperation between insects and flowering plants or of bottom-feeding predators in the oceans. Some of the proposed mechanisms required a very brief period during which all extinctions suddenly took place; other mechanisms would be more likely to have taken place more gradually, over an extended period, or at different times on different continents. Some hypotheses fail to account for simultaneous extinctions on land and in the seas. Each mass extinction may have had a different cause. Evidence points to hunting by humans and habitat destruction as the likely causes for the current mass extinction. American paleontologists David Raup and John Sepkoski, who have studied extinction rates in a number of fossil groups, suggest that episodes of increased extinction have recurred periodically, approximately every 26 million years since the mid-Cretaceous period. The late Cretaceous extinction of the dinosaurs and ammonoids was just one of the more drastic in a whole series of such recurrent extinction episodes. The possibility that mass extinctions may recur periodically has given rise to such hypotheses as that of a companion star with a long-period orbit deflecting other bodies from their normal orbits, making some of them fall to Earth as meteors and causing widespread devastation upon impact. Of the various hypotheses attempting to account for the late Cretaceous extinctions, the one that has attracted the most attention in recent years is the asteroid-impact hypothesis first suggested by Luis and Walter Alvarez. According to this hypothesis, Earth collided with an asteroid with an estimated diameter of 10 kilometers, or with several asteroids, the combined mass of which was comparable. The force of collision spewed large amounts of debris into the atmosphere, darkening the skies for several years before the finer particles settled. The reduced level of photosynthesis led to a massive decline in plant life of all kinds, and this caused massive starvation first of herbivores and subsequently of carnivores. The mass extinction would have occurred very suddenly under this hypothesis. One interesting test of the Alvarez hypothesis is based on the presence of the rare-earth element iridium Ir. Earth's crust contains very little of this element, but most asteroids contain a lot more. Debris thrown into the atmosphere by an asteroid collision would presumably contain large amounts of iridium, and atmospheric currents would carry this material all over the globe. A search of sedimentary deposits that span the boundary between the Cretaceous and Tertiary periods shows that there is a dramatic increase in the abundance of iridium briefly and precisely at this boundary. This iridium anomaly offers strong support for the Alvarez hypothesis even though no asteroid itself has ever been recovered. An asteroid of this size would be expected to leave an

immense crater, even if the asteroid itself was disintegrated by the impact. The intenseheat of the impact would produce heat-shocked quartz in many types of rock. Also, large blocks thrown aside by the impact would form secondary craters surrounding the main crater. To date, several such secondary craters have been found along Mexico's Yucatán Peninsula, and heat-shocked quartz has been found both in Mexico and in Haiti. A location called Chicxulub, along the Yucatán coast, has been suggested as the primary impact site.

question 1

Paragraph 1 supports which of the following statements about mass extinctions?

A They take place over a period of 70 million years.

B They began during the Cretaceous period.

C They eliminate many animal species that exist at the time they occur.

D They occur every 250 million years.

question 2

According to paragraph 2, scientists base their belief that a mass extinction is going on at present on which of the following?

A The speed with which mass extinctions are happening today is similar to the speed of past extinctions.

B The number of species that have died out since the last extinction event is extremely large.

C Mass extinctions occur with regularity and it is time for another one.

D Fossil records of many marine species have disappeared.

question 3

According to paragraph 3, each of the following has been proposed as a possible cause of mass extinctions EXCEPT

A habitat destruction

B continental movement

C fierce interspecies competition

D changes in Earth’ s temperature

question 4

Paragraph 3 supports which of the following ideas about mass extinctions?

A Scientists know the exact causes of most mass extinctions.

B Mass extinctions are unlikely to happen again in the future.

C Insects, flowering plants, and bottom-feeding predators in the oceans tend to be the first organisms to disappear during episodes of mass extinctions.

D Some mass extinctions occurred on land and in the seas at the same time.

question 5

Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A Based on their studies of extinction rates of numerous fossil groups, paleontologists David Raup and John Sepkoski have determined that mass extinctions occur about every 26 million years.

B David Raup and John Sepkoski studied extinction rates of numerous fossil groups and suggest that mass extinctions during the Cretaceous period continued for 26 million years.

C Studies that paleontologists David Raup and John Sepkoski conducted of various fossil groups have revealed that extinction rates have increased over the past 26 million years.

D The studies conducted by paleontologists David Raup and John Sepkoski of the fossil remains of species suggest that the extinction rate of species started to increase by the middle of the Cretaceous period.

question 6

According to paragraph 4, what aspect of extinction episodes does the companion-star hypothesis supposedly clarify?

A Their location

B Their frequency

C Their duration

D Their severity

question 7

According to paragraph 6, what made iridium a useful test of the Alvarez hypothesis?

A Its occurrence in a few locations on Earth against several locations on other planets

B Its occurrence in limited quantities on Earth against its abundance in asteroids

C Its ability to remain solid at extremely high temperatures

D Its ease of detection even in very small amounts

question 8

In stating that “no asteroid itself has ever been recovered” , the author emphasizes which of the following?

A The importance of the indirect evidence for a large asteroid

B The fact that no evidence supports the asteroid-impact hypothesis

C The reason many researchers reject the Alvarez hypothesis

D The responsibility of scientists for not making the effort to discover the asteroid itself

question 9

What is the purpose of paragraph 7 in the passage?

A It proposes a decisive new test of the Alvarez hypothesis.

B It presents additional supporting evidence for the Alvarez hypothesis.

C It explains why evidence relating to the Alvarez hypothesis is hard to find.

D It shows how recent evidence has raised doubts about the Alvarez hypothesis.

question 10

Look at the four squares [ ] that indicate where the following sentence could be added to the passage.

[] Cases in which many species become extinct within a geologically short interval of time are called mass extinctions. [] There was one such event at the end of the Cretaceous period around 70 million years ago. [] There was another, even larger, mass extinction at the end of the Permian period around 250 million years ago. [] The Permian event has attracted much less attention than other mass extinctions because mostly unfamiliar species perished at that time. The fossil record shows at least five mass extinctions in which many families of marine organisms died out. The rates of extinction happening today are as great as the rates during these mass extinctions. Many scientists have therefore concluded that a sixth great mass extinction is currently in progress. What could cause such high rates of extinction? There are several hypotheses, including warming or cooling of Earth, changes in seasonal fluctuations or ocean currents, and changing positions of the continents. Biological hypotheses include ecological changes brought about by the evolution of cooperation between insects and flowering plants or of bottom-feeding predators in the oceans. Some of the proposed mechanisms required a very brief period during which all extinctions suddenly took place; other mechanisms would be more likely to have taken place more gradually, over an extended period, or at different times on different continents. Some hypotheses fail to account for simultaneous extinctions on land and in the seas. Each mass extinction may have had a different cause. Evidence points to hunting by humans and habitat destruction as the likely causes for the current mass extinction. American paleontologists David Raup and John Sepkoski, who have studied extinction rates in a number of fossil groups, suggest that episodes of increased extinction have recurred periodically, approximately every 26 million years since the mid-Cretaceous period. The late Cretaceous extinction of the dinosaurs and ammonoids was just one of the more drastic in a whole series of such recurrent extinction episodes. The possibility that mass extinctions may recur periodically has given rise to such hypotheses as that of a companion star with a long-period orbit deflecting other bodies from their normal orbits, making some of them fall to Earth as meteors and causing widespread devastation upon impact. Of the various hypotheses attempting to account for the late Cretaceous extinctions, the one that has attracted the most attention in recent years is the asteroid-impact hypothesis first suggested by Luis and Walter Alvarez. According to this hypothesis, Earth collided with an asteroid with an estimated diameter of 10 kilometers, or with several asteroids, the combined mass of which was comparable. The force of collision spewed large amounts of debris into the atmosphere, darkening the skies for several years before the finer particles settled. The reduced level of photosynthesis led to a massive decline in plant life

of all kinds, and this caused massive starvation first of herbivores and subsequently of carnivores. The mass extinction would have occurred very suddenly under this hypothesis. One interesting test of the Alvarez hypothesis is based on the presence of the rare-earth element iridium Ir. Earth's crust contains very little of this element, but most asteroids contain a lot more. Debris thrown into the atmosphere by an asteroid collision would presumably contain large amounts of iridium, and atmospheric currents would carry this material all over the globe. A search of sedimentary deposits that span the boundary between the Cretaceous and Tertiary periods shows that there is a dramatic increase in the abundance of iridium briefly and precisely at this boundary. This iridium anomaly offers strong support for the Alvarez hypothesis even though no asteroid itself has ever been recovered. An asteroid of this size would be expected to leave an immense crater, even if the asteroid itself was disintegrated by the impact. The intenseheat of the impact would produce heat-shocked quartz in many types of rock. Also, large blocks thrown aside by the impact would form secondary craters surrounding the main crater. To date, several such secondary craters have been found along Mexico's Yucatán Peninsula, and heat-shocked quartz has been found both in Mexico and in Haiti. A location called Chicxulub, along the Yucatán coast, has been suggested as the primary impact site.