

Line In 1971 researchers hoping to predict earthquakes in
the short term by identifying precursory phenomena
(those that occur a few days before large quakes
but not otherwise) turned their attention to changes
(5) in seismic waves that had been detected prior to
earthquakes. An explanation for such changes was
offered by "dilatancy theory," based on a well-known
phenomenon observed in rocks in the laboratory:
as stress builds, microfractures in rock close,
(10) decreasing the rock's volume. But as stress
continues to increase, the rock begins to crack and
expand in volume, allowing groundwater to seep in,
weakening the rock. According to this theory, such
effects could lead to several precursory phenomena in
(15) the field, including a change in the velocity of seismic
waves, and an increase in small, nearby tremors.

Researchers initially reported success in identifying
these possible precursors, but subsequent analyses
of their data proved disheartening. Seismic waves
(20) with unusual velocities were recorded before some
earthquakes, but while the historical record confirms
that most large earthquakes are preceded by minor
tremors, these foreshocks indicate nothing about
the magnitude of an impending quake and are
(25) indistinguishable from other minor tremors that occur
without large earthquakes.

In the 1980s, some researchers turned their
efforts from short-term to long-term prediction.
Noting that earthquakes tend to occur repeatedly in
(30) certain regions, Lindh and Baker attempted to identify
patterns of recurrence, or earthquake cycles, on which
to base predictions. In a study of earthquake-prone
sites along the San Andreas Fault, they determined
that quakes occurred at intervals of approximately 22
(35) years near one site and concluded that there was a
95 percent probability of an earthquake in that area
by 1992. The earthquake did not occur within the time
frame predicted, however.

Line Evidence against the kind of regular
(40) earthquake cycles that Lindh and Baker tried
to establish has come from a relatively new
field, paleoseismology. Paleoseismologists
have unearthed and dated geological features
such as fault scarps that were caused by
(45) earthquakes thousands of years ago. They have
determined that the average interval between ten
earthquakes that took place at one site along the
San Andreas Fault in the past two millennia was
132 years, but individual intervals ranged greatly,
(50) from 44 to 332 years.

Questions 11–16 refer to the passage.

11. The passage is primarily concerned with
- (A) explaining why one method of earthquake prediction has proven more practicable than an alternative method
 - (B) suggesting that accurate earthquake forecasting must combine elements of long-term and short-term prediction
 - (C) challenging the usefulness of dilatancy theory for explaining the occurrence of precursory phenomena
 - (D) discussing the deficiency of two methods by which researchers have attempted to predict the occurrence of earthquakes
 - (E) describing the development of methods for establishing patterns in the occurrence of past earthquakes

12. According to the passage, laboratory evidence concerning the effects of stress on rocks might help account for
- (A) differences in magnitude among earthquakes
 - (B) certain phenomena that occur prior to earthquakes
 - (C) variations in the intervals between earthquakes in a particular area
 - (D) differences in the frequency with which earthquakes occur in various areas
 - (E) the unreliability of short-term earthquake predictions
13. It can be inferred from the passage that one problem with using precursory phenomena to predict earthquakes is that minor tremors
- (A) typically occur some distance from the sites of the large earthquakes that follow them
 - (B) are directly linked to the mechanisms that cause earthquakes
 - (C) are difficult to distinguish from major tremors
 - (D) have proven difficult to measure accurately
 - (E) are not always followed by large earthquakes
14. According to the passage, some researchers based their research about long-term earthquake prediction on which of the following facts?
- (A) The historical record confirms that most earthquakes have been preceded by minor tremors.
 - (B) The average interval between earthquakes in one region of the San Andreas Fault is 132 years.
 - (C) Some regions tend to be the site of numerous earthquakes over the course of many years.
 - (D) Changes in the volume of rock can occur as a result of building stress and can lead to the weakening of rock.
 - (E) Paleoseismologists have been able to unearth and date geological features caused by past earthquakes.
15. The passage suggests which of the following about the paleoseismologists' findings described in lines 42–50?
- (A) They suggest that the frequency with which earthquakes occurred at a particular site decreased significantly over the past two millennia.
 - (B) They suggest that paleoseismologists may someday be able to make reasonably accurate long-term earthquake predictions.
 - (C) They suggest that researchers may someday be able to determine which past occurrences of minor tremors were actually followed by large earthquakes.
 - (D) They suggest that the recurrence of earthquakes in earthquake-prone sites is too irregular to serve as a basis for earthquake prediction.
 - (E) They indicate that researchers attempting to develop long-term methods of earthquake prediction have overlooked important evidence concerning the causes of earthquakes.
16. The author implies which of the following about the ability of the researchers mentioned in line 18 to predict earthquakes?
- (A) They can identify when an earthquake is likely to occur but not how large it will be.
 - (B) They can identify the regions where earthquakes are likely to occur but not when they will occur.
 - (C) They are unable to determine either the time or the place that earthquakes are likely to occur.
 - (D) They are likely to be more accurate at short-term earthquake prediction than at long-term earthquake prediction.
 - (E) They can determine the regions where earthquakes have occurred in the past but not the regions where they are likely to occur in the future.

- Line Exactly when in the early modern era Native Americans began exchanging animal furs with Europeans for European-made goods is uncertain. What is fairly certain, even though they left
- (5) no written evidence of having done so, is that the first Europeans to conduct such trade during the modern period were fishing crews working the waters around Newfoundland. Archaeologists had noticed that sixteenth-century Native American
- (10) sites were strewn with iron bolts and metal pins. Only later, upon reading Nicolas Denys's 1672 account of seventeenth-century European settlements in North America, did archaeologists realize that sixteenth-century European fishing
- (15) crews had dismantled and exchanged parts of their ships for furs.
- By the time Europeans sailing the Atlantic coast of North America first documented the fur trade, it was apparently well underway. The first to record
- (20) such trade—the captain of a Portuguese vessel sailing from Newfoundland in 1501—observed that a Native American aboard the ship wore Venetian silver earrings. Another early chronicler noted in 1524 that
- (25) Native Americans living along the coast of what is now New England had become selective about European trade goods: they accepted only knives, fishhooks, and sharp metal. By the time Cartier sailed the Saint Lawrence River ten years later, Native Americans had
- (30) traded with Europeans for more than thirty years, perhaps half a century.

Questions 46–54 refer to the passage.

46. The author of the passage draws conclusions about the fur trade in North America from all of the following sources EXCEPT
- (A) Cartier's accounts of trading with Native Americans
 - (B) a seventeenth-century account of European settlements
 - (C) a sixteenth-century account written by a sailing vessel captain
 - (D) archaeological observations of sixteenth-century Native American sites
 - (E) a sixteenth-century account of Native Americans in what is now New England

47. The passage suggests that which of the following is partially responsible for the difficulty in establishing the precise date when the fur trade in North America began?
- (A) A lack of written accounts before that of Nicolas Denys in 1672
 - (B) A lack of written documentation before 1501
 - (C) Ambiguities in the evidence from Native American sources
 - (D) Uncertainty about Native American trade networks
 - (E) Uncertainty about the origin of artifacts supposedly traded by European fishing crews for furs
48. Which of the following, if true, most strengthens the author's assertion in the first sentence of the second paragraph?
- (A) When Europeans retraced Cartier's voyage in the first years of the seventeenth century, they frequently traded with Native Americans.
 - (B) Furs from beavers, which were plentiful in North America but nearly extinct in Europe, became extremely fashionable in Europe in the final decades of the sixteenth century.
 - (C) Firing arms were rarely found on sixteenth-century Native American sites or on European lists of trading goods since such arms required frequent maintenance and repair.
 - (D) Europeans and Native Americans had established trade protocols, such as body language assuring one another of their peaceful intentions, that antedate the earliest records of trade.
 - (E) During the first quarter of the sixteenth century, an Italian explorer recorded seeing many Native Americans with what appeared to be copper beads, though they may have been made of indigenous copper.
49. Which of the following best describes the primary function of lines 11–16?
- (A) It offers a reconsideration of a claim made in the preceding sentence.
 - (B) It reveals how archaeologists arrived at an interpretation of the evidence mentioned in the preceding sentence.

- (C) It shows how scholars misinterpreted the significance of certain evidence mentioned in the preceding sentence.
- (D) It identifies one of the first significant accounts of seventeenth-century European settlements in North America.
- (E) It explains why Denys's account of seventeenth-century European settlements is thought to be significant.
50. It can be inferred from the passage that the author would agree with which of the following statements about the fur trade between Native Americans and Europeans in the early modern era?
- (A) This trade may have begun as early as the 1480s.
- (B) This trade probably did not continue much beyond the 1530s.
- (C) This trade was most likely at its peak in the mid-1520s.
- (D) This trade probably did not begin prior to 1500.
- (E) There is no written evidence of this trade prior to the seventeenth century.
51. Which of the following can be inferred from the passage about the Native Americans mentioned in line 25?
- (A) They had little use for decorative objects such as earrings.
- (B) They became increasingly dependent on fishing between 1501 and 1524.
- (C) By 1524, only certain groups of Europeans were willing to trade with them.
- (D) The selectivity of their trading choices made it difficult for them to engage in widespread trade with Europeans.
- (E) The selectivity of their trading choices indicates that they had been trading with Europeans for a significant period of time prior to 1524.
52. The passage supports which of the following statements about sixteenth-century European fishing crews working the waters off Newfoundland?
- (A) They wrote no accounts of their fishing voyages.
- (B) They primarily sailed under the flag of Portugal.
- (C) They exchanged ship parts with Native Americans for furs.
- (D) They commonly traded jewelry with Native Americans for furs.
- (E) They carried surplus metal implements to trade with Native Americans for furs.
53. Which of the following can be inferred from the passage about evidence pertaining to the fur trade between Native Americans and Europeans in the early modern era?
- (A) A lack of written evidence has made it difficult to establish which Europeans first participated in this trade.
- (B) In general, the physical evidence pertaining to this trade has been more useful than the written evidence has been.
- (C) There is more written evidence pertaining to this trade from the early part of the sixteenth century than from later in that century.
- (D) The earliest written evidence pertaining to this trade dates from a time when the trade was already well established.
- (E) Some important pieces of evidence pertaining to this trade, such as Denys's 1672 account, were long overlooked by archaeologists.
54. The passage suggests which of the following about the sixteenth-century Native Americans who traded with Europeans on the coast of what is now called New England?
- (A) By 1524 they had become accustomed to exchanging goods with Europeans.
- (B) They were unfamiliar with metals before encountering Europeans.
- (C) They had no practical uses for European goods other than metals and metal implements.
- (D) By 1524 they had become disdainful of European traders because such traders had treated them unfairly in the past.
- (E) By 1524 they demanded only the most prized European goods because they had come to realize how valuable furs were on European markets.