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Exercise 35

It is their sensitive response to human circumstance that accounts for the persistence of certain universal ideas. Rabbi Meir, a second-century scholar, admonished his disciples to look not at the pitcher but at its contents because, he stated, "Many a new pitcher has been found to be full of old wine." Creative ideas not only produce their own instruments of survival as time and circumstances demand, but permit the substitution of new forms for old under the pressure of changed circumstances. For example, democracy, as an idea, originated in ancient Greece and was carried from there to Western Europe and the Americas. But it did not retain the ancient Greek form: it passed through several reforming processes and exists today in many countries. Democratic governments differ in form because democracy is in principle dynamic and has therefore responded to local needs.

(141 words)

- 1. According to the passage, democracy is an example of
- (A) a human circumstance that has molded creative ideas
- (B) an instrument of survival that has altered its original form
- (C) an attribute of a creative idea that has allowed that idea to persist
- (D) a creative idea that has persisted because of its adaptability
- (E) a reforming process that has culminated in the creation of modern governments
- 2. The "new pitcher" mentioned in the passage is the equivalent of which of the following elements in the author's discussion of democracy?
 - (A) Ancient Greece
 - (B) The idea of democracy
 - (C) A modern democratic government
 - (D) A dynamic principle
 - (E) The Greek form of democracy







Aided by the recent ability to analyze samples of air trapped in glaciers, scientists now have a clearer idea of the relationship between atmospheric composition and global temperature change over the past 160,000 years. In particular, determination of atmospheric composition during periods of glacial expansion and retreat (cooling and warming) is possible using data from the 2,000-meter Vostok ice core drilled in Antarctica. The technique involved is similar to that used in analyzing cores of marine sediments, where the ratio of the two common isotopes of oxygen, ¹⁸O and ¹⁶O, accurately reflects past temperature changes. Isotopic analysis of oxygen in the Vostok core suggests mean global temperature fluctuations of up to 10 degrees centigrade over the past 160,000 years.

Data from the Vostok core also indicate that the amount of carbon dioxide has fluctuated with temperature over the same period: the higher the temperature, the higher the concentration of carbon dioxide and the lower the temperature, the lower the concentration. Although change in carbon dioxide content closely follows change in temperature during periods of deglaciation, it apparently lags behind temperature during periods of cooling. The correlation of carbon dioxide with temperature, of course, does not establish whether changes in atmospheric composition caused the warming and cooling trends or were caused by them.

The correlation between carbon dioxide and temperature throughout the Vostok record is consistent and predictable. The absolute temperature changes, however, are from 5 to 14 times greater than would be expected on the basis of carbon dioxide's own ability to absorb infrared radiation, or radiant heat. This reaction suggests that, quite aside from changes in heat-trapping gases, commonly known as greenhouse gases, certain positive feedbacks are also amplifying the temperature change. Such feedbacks might involve ice on land and sea, clouds, or water vapor, which also absorb radiant heat.

Other data from the Vostok core show that methane gas also correlates closely with temperature and carbon dioxide. The methane concentration nearly doubled, for example, between the peak of the penultimate glacial period and the following interglacial period. Within the present interglacial period it has more than doubled in just the past 300 years and is rising rapidly. Although the concentration of atmospheric methane is more than two orders of magnitude lower than that of carbon dioxide, it cannot be ignored: the radiative properties of methane make it 20 times more effective, molecule for molecule, than carbon dioxide in absorbing radiant heat. On the basis of a simulation model that climatological researchers have developed, methane appears to have been about 25 percent as important as carbon dioxide in the warming that took place during the most recent glacial retreat 8,000 to 10,000 years ago.

(445 words)







For the following question, consider each of the choices separately and select all that apply

- 3. The passage provides information to support which of the following statements about methane EXCEPT?
- A Methane is more effective than carbon dioxide in absorbing radiant heat.
- B The higher the concentration of carbon dioxide in the Earth's atmosphere; the lower the concentration of methane.
- Most of the global warming that has occurred during the past 10 years has been associated with increased methane concentration.
- 4. According to the passage, which of the following statements best describes the relationship between carbon dioxide and global temperature?
 - (A) Carbon dioxide levels change immediately in response to changes in temperature.
 - (B) Carbon dioxide levels correlate with global temperature during cooling periods only.
 - (C) Once carbon dioxide levels increase, they remain high regardless of changes in global temperature.
 - (D)Carbon dioxide levels increase more quickly than global temperature does.
 - (E) During cooling periods, carbon dioxide levels initially remain high and then decline.

- 5. It can be inferred from the passage that a long-term decrease in the concentration of carbon dioxide in the Earth's atmosphere would
 - (A) increase methane concentration in the Earth's atmosphere
 - (B) accompany a period of glaciation
 - (C) encourage the formation of more oxygen isotopes in the Earth's atmosphere
 - (D) promote the formation of more water in the Earth's global environment
 - (E) increase the amount of infrared radiation absorbed by the Earth's atmosphere
- 6. The passage suggests that when the methane concentration in the Earth's atmosphere decreases, which of the following also happens?
 - (A) Glaciers melt faster.
 - (B) The concentration of carbon dioxide increases.
 - (C) The mean global temperature decreases.
 - (D) Carbon dioxide absorbs more radiant beat
 - (E) More clouds form in the Earth's atmosphere





The essential condition for the decay of the vacuum is the presence of an intense electric field. As a result of the decay of the vacuum, the space permeated by such a field can be said to acquire an electric charge, and it can be called a charged vacuum. The particles that materialize in the space make the charge manifest. An electric field of sufficient intensity to create a charged vacuum is likely to be found in only one place: in the immediate vicinity of a superheavy atomic nucleus, one with about twice as many protons as the heaviest natural nuclei known. A nucleus that large cannot be stable, but it might be possible to assemble one next to a vacuum for long enough to observe the decay of the vacuum.

(131 words)

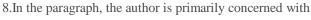
- 7. The author's assertions concerning the conditions that lead to the decay of the vacuum would be most weakened if which of the following occurred?
 - (A) Scientists created an electric field next to a vacuum, but found that the electric field was not intense enough to create a charged vacuum.
 - (B) Scientists assembled a superheavy atomic nucleus next to a vacuum, but found that no virtual particles were created in the vacuum's region of space.
 - (C) Scientists assembled a superheavy atomic nucleus next to a vacuum, but found that they could not then detect any real particles in the vacuum's region of space.
 - (D)Scientists introduced a virtual electron and a virtual positron into a vacuum's region of space, but found that the vacuum did not then fluctuate.
 - (E) Scientists introduced a real electron and a real positron into a vacuum's region of space, but found that the total energy of the space increased by the energy equivalent of the mass of the particles.







Historians have only recently begun to note the increase in demand for luxury goods and services that took place in eighteenth-century England. To answer the question of why consumers became so eager to buy, some historians have pointed to the ability of manufacturers to advertise in a relatively uncensored press. This, however, hardly seems a sufficient answer. McKendrick favors a Veblen model of conspicuous consumption stimulated by competition for status. The "middling sort" bought goods and services because they wanted to follow fashions set by the rich. Again, we may wonder whether this explanation is sufficient. Do not people enjoy buying things as a form of self-gratification? If so, consumerism could be seen as a product of the rise of new concepts of individualism and materialism, but not necessarily of the frenzy for conspicuous competition. (135 words)



- (A) contrasting two theses and offering a compromise
- (B) questioning two explanations and proposing a possible alternative to them.
- (C) paraphrasing the work of two historians and questioning their assumptions
- (D) examining two theories and endorsing one over the other
- (E) raising several questions but implying that they cannot be answered.
- According to the passage, a Veblen model of conspicuous consumption has been used to
 - (A) investigate the extent of the demand for luxury goods among social classes in eighteenthcentury England
 - (B) classify the kinds of luxury goods desired by eighteenth-century consumers
 - (C) explain the motivation of eighteenth-century consumers to buy luxury goods
 - (D) establish the extent to which the tastes of rich consumers were shaped by the middle classes in eighteenth-century England
 - (E)compare luxury consumerism in eighteenthcentury England with such consumerism in the twentieth century







How can the hormone adrenaline that does not act directly on the brain have a regulatory effect on brain function? Recently, we tested the possibility that one of the hormone's actions outside the brain might be responsible. Since one consequence of adrenaline release in an animal is an increase in blood glucose levels, we examined the effects of glucose on memory in rats. We found that glucose injected immediately after training enhances memory tested the next day. Additional evidence was provided by negative findings: drugs called adrenergic antagonists, which block peripheral adrenaline receptors, disrupted adrenaline's ability to regulate memory but did not affect memory enhancements produced by glucose that was not stimulated by adrenaline. These results are as they should be if adrenaline affects memory modulation by increasing blood glucose levels. (131 words)

- 10. The author refers to the results of the experiment using adrenergic antagonists as "negative findings" most likely because the adrenergic antagonists
- (A) failed to disrupt adrenaline's effect on memory
- (B) did not affect glucose's ability to enhance memory.
- (C) did not block adrenaline's ability to increase blood glucose levels
- (D) only partially affected adrenaline's ability to enhance memory
- (E) disrupted both adrenaline's and glucose's effect on memory









