

Figure 1

Is San Francisco Next?

[1] Jian Lin was 14 years old in 1973, when the Chinese government under Mao Zedong recruited him for a student science team called “the earthquake watchers.” After a series of earthquakes that had killed thousands in northern China, the country’s [seismologists](#)

¹ thought that if they [augmented](#)² their own research by having observers keep an eye out for anomalies like snakes bolting early from their winter dens and [erratic](#)³ well-water levels, they might be able to do what no scientific body had managed before: issue an earthquake warning that would save thousands of lives.

[2] In the winter of 1974, the earthquake watchers were picking up some suspicious signals near the city of Haicheng. Panicked chickens were squalling and trying to escape their pens; water levels were falling in wells. Seismologists had also begun noticing a telltale pattern of small quakes. “They were like popcorn kernels,” Lin tells me, “popping up all over the general area.” Then, suddenly, the popping stopped, just as it had before a catastrophic earthquake in 1966 that killed more than 8,000. “Like ‘the calm before the storm,’ ” Lin says. “We have that exact same phrase in Chinese.” On the morning of February 4, 1975, the seismology bureau issued a warning: Haicheng should expect a big earthquake, and people should move outdoors.

[3] At 7:36 p.m., a magnitude 7.0 quake struck. The city was nearly leveled, but only about 2,000 people were killed. Without the warning, easily 150,000 would have died. “And so you finally had an earthquake forecast that did indeed save lives,” Lin recalls. “People were excited. Or, you could say, uplifted. *Uplifted* is a great word for it.” But uplift turned to heartbreak the very next year, when a 7.5 quake shattered the city of Tangshan without so much as a magnitude 4 to introduce it. When the quake hit the city of 1.6 million at 3:42 a.m., it killed nearly 250,000 people, most of whom were asleep. “If there was any moment in my life when I was scared of earthquakes, that was it,” Lin says. “You think, what if it happened to you? And it could. I decided that if I could do anything—*anything*—to save lives lost to earthquakes, it would be worth the effort.”

[4] Lin is now a senior scientist of geophysics at Woods Hole Oceanographic Institution, in Massachusetts, where he spends his time studying not the scurrying of small animals and fluctuating electrical current between trees (another fabled warning sign), but seismometer readings, GPS coordinates, and global earthquake-notification reports. He and his longtime collaborator, Ross Stein of the U.S. Geological Survey, are champions of a theory that could enable scientists to forecast earthquakes with more precision and speed.

[5] Some established [geophysicists](#)

⁴ insist that all earthquakes are random, yet everyone agrees that aftershocks are not. Instead, they follow certain empirical laws. Stein, Lin, and their collaborators hypothesized that many earthquakes classified as main shocks are actually aftershocks, and they went looking for the forces that cause faults to fail.

[6] Their work was in some ways [heretical](#)

⁵: For a long time, earthquakes were thought to release only the stress immediately around them; an earthquake that happened in one place would decrease the possibility of another happening nearby. But that didn’t explain earthquake sequences like the one that rumbled through the desert and mountains east of Los Angeles in 1992. The series began on April 23 with a 6.2 near the town of Joshua Tree; two months later, on June 28, a 7.3 struck less than 15 miles away in the desert town of Landers. Three and a half hours after that, a 6.5 hit the town of Big Bear, in the mountains overlooking the Mojave. The Big Bear quake was timed like an aftershock, except it was too far off the Landers earthquake’s fault rupture. When Lin, Stein, and Geoffrey King of the Paris Geophysical Institute got together to analyze it, they decided to ignore the distance rule and treat it just as a different kind of aftershock. Their ensuing report, “Static Stress Changes and the Triggering of Earthquakes,” became one of the decade’s most-cited earthquake research papers.

[7] Rocks can be subject to two kinds of stresses: the “clamping” stress that pushes them together, and the “shear” stress they undergo as they slide past each other. Together, these stresses are known as Coulomb stress, named for Charles-Augustin de Coulomb, an 18th-century French physicist. Coulomb calculations had been used for years in engineering, to find the failure points

of various building materials, but they'd never been applied properly to faults. It turned out, though, that faults in the ground behave much like rocks in the laboratory: they come unglued when shear stress exceeds the friction and pressure (the clamping stress) holding them together. When Stein, Lin, and King applied the Coulomb model to the California sequence, they found that most of the earthquakes had occurred in areas where the shifting of the ground had caused increased stress.

[8] In 1997, Stein and two other geologists using the model found that there was a 12 percent chance that a magnitude 7 or greater would hit near Izmit, Turkey, within 30 years; two years later, on August 17, 1999, a magnitude 7.4 destroyed the city, which wasn't designed to withstand such a tremor. A Turkish geologist named Aykut Barka quickly wrote up a paper warning that Coulomb stress from the Izmit quake could trigger a similar rupture near Düzce, a town roughly 60 miles east. His work persuaded authorities there to close school buildings damaged during the Izmit shaking. On November 12, a segment of the North Anatolian Fault gave way, in a magnitude 7.2. The empty school buildings collapsed.

[9] Lin and Stein both admit that Coulomb stress doesn't explain all earthquakes. Indeed, some geophysicists, like Karen Felzer, of the U.S. Geological Survey, think their hypothesis gives [short shrift](#)

⁶ to the impact that dynamic stress—the actual rattling of a quake in motion—has on neighboring faults.

[10] In the aftermath of the disastrous March 11 Tōhoku quake, both camps are looking at its well-monitored aftershocks (including several within 100 miles of Tokyo) for answers. Intriguingly, it was *preceded* by a flurry of earthquakes, one as large as magnitude 7.2, that may have been foreshocks, although no one thought so at the time; the researchers are trying to determine what those early quakes meant.

[11] When I ask Lin whether California, where I live, is next, he laughs. “I understand that the public now thinks that we've entered a global earthquake cluster. Even my own mother in China thinks that. But there's no scientific evidence whatsoever to suggest that the earthquake in New Zealand triggered the earthquake in Japan, or Japan will trigger one in California.” Still, Lin and his colleagues do wonder whether Tōhoku has pushed neighboring faults closer to rupture. “I am particularly interested in how this earthquake might have changed the potential of future earthquakes to the south, even closer to Tokyo,” Lin tells me. “There, even a much smaller earthquake could be devastating.”

—Judith Lewis Mernit
“Is San Francisco Next?”
The Atlantic, June 2011

¹seismologists — people who study earthquakes

²augmented — added to

³erratic — unpredictable

⁴geophysicists — people who study the physics of the earth and its environment, including seismology

⁵heretical — against the opinion of authorities

⁶short shrift — little consideration

1. [Refer to figure 1]

Throughout the text, the author portrays Jian Lin as

1. satisfied
2. superstitious
3. cautious
4. dedicated

2. [Refer to figure 1]

According to paragraph 7, seismologists realized that the California sequence of earthquakes happened because

1. shear stress forced rocks to fuse together
2. clamping stress caused rocks to move apart
3. shear stress was greater than clamping stress
4. clamping stress balanced the shear stress

3. [Refer to figure 1]

Which statement reflects a long-held belief disproved by Lin, Stein, and King?

1. “many earthquakes classified as main shocks are actually aftershocks” (end of paragraph 5)
2. “an earthquake that happened in one place would decrease the possibility of another happening nearby” (beginning of paragraph 6)
3. “Rocks can be subject to two kinds of stresses” (beginning of paragraph 7)
4. “faults in the ground behave much like rocks in the laboratory” (middle of paragraph 7)

4. [Refer to figure 1]

The word “champions” as used near the end of paragraph 4 most nearly means

1. advisers
2. supporters
3. adaptors
4. survivors

5. [Refer to figure 1]

Read the following excerpt from paragraph 4:

Lin is now a senior scientist of geophysics at Woods Hole Oceanographic Institution, in Massachusetts, where he spends his time studying not the scurrying of small animals and fluctuating electrical current between trees (another fabled warning sign), but seismometer readings, GPS coordinates, and global earthquake-notification reports.

The purpose of these lines from paragraph 4 is to emphasize that Jian Lin

1. relied on his past experience to identify earthquakes
2. modified his methods of observing earthquakes
3. changed his understanding about the causes of earthquakes
4. disagreed with his co-researcher on the measurement of earthquakes

6. [Refer to figure 1]

The contrast drawn between the Haicheng and Tangshan earthquakes (paragraphs 2 and 3) contributes to a central idea that earthquakes are

1. preceded by reliable signs
2. controlled by observable factors
3. not always predictable
4. not often studied

7. [Refer to figure 1]

Read the following excerpt from paragraph 2:

“They were like popcorn kernels,” Lin tells me, “popping up all over the general area.”

The figurative language in this sentence conveys a sense of

1. disbelief
2. apathy
3. disappointment
4. urgency

8. [Refer to figure 1]

The first paragraph contributes to a central idea in the text by

1. contributing historical facts
2. contrasting early theories
3. comparing two philosophies
4. challenging cultural beliefs

9. [Refer to figure 1]

As used in the first paragraph, the word “anomalies” most nearly means

1. seasonal changes
2. odd occurrences
3. dangerous incidents
4. scheduled events

Figure 2

Solar Storms

In this passage, Dora-Rouge, a Native American Indian elder, is traveling back to her homeland by canoe with a small group of women.

[1] ...As we traveled, we entered time and began to trouble it, to pester it apart or into some kind of change. On the short nights we sat by firelight and looked at the moon’s long face on water. Dora-Rouge would lie on the beaver blankets and tell us what place we would pass on the next day. She’d look at the stars in the shortening night and say, “the Meeting Place,” or “God Island.” True to her word, the next day we reached those places. ...

[2] Now, looking back, I understand how easily we lost track of things. The time we’d been teasing apart, unraveled. And now it began to unravel us as we entered a kind of timelessness. Wednesday was the last day we called by name, and truly, we no longer needed time. We were lost from it, and lost in this way, I came alive. It was as if I’d slept for years, and was now awake. The others felt it, too. Cell by cell, all of us were taken in by water and by land, swallowed a little at a time. What we’d thought of as our lives and being on earth was gone, and now the world was made up of pathways of its own invention. We were only one of the many dreams of earth. And I knew we were just a small dream.

[3] But there was a place inside the human that spoke with land, that entered dreaming, in the way that people in the north found direction in their dreams. They dreamed charts of land and currents of water. They dreamed where food animals lived. These dreams they called hunger maps and when they followed those maps, they found their prey. It was the language animals and humans had in common. People found their cures in the same way. ...

[4] For my own part in this dreaming, as soon as I left time, when Thursday and Friday slipped away, plants began to cross my restless sleep in abundance. A tendril reached through darkness, a first sharp leaf came up from the rich ground of my sleeping, opened upward from the place in my body that knew absolute truth. It wasn’t a seed that had been planted there, not a cultivated growing, but a wild one, one that had been there all along, waiting. I saw vines creeping forward. Inside the thin lid of an eye, petals opened, and there was pollen at the center of each flower. Field, forest, swamp. I knew how they breathed at night, and that they were linked to us in that breath. It was the oldest bond of survival. I was devoted to woods the wind walked through, to mosses and lichens. Somewhere in my past, I had lost the knowing of this opening light of life, the taking up of minerals from dark ground, the magnitude of thickets and brush. Now I found it once again. Sleep changed me. I remembered things I’d forgotten, how a hundred years ago, leaves reached toward sunlight, plants bent into currents of water. Something persistent nudged me and it had morning rain on its leaves.

[5] Maybe the roots of dreaming are in the soil of dailiness, or in the heart, or in another place without words, but when they come together and grow, they are like the seeds of hydrogen and the seeds of oxygen that together create ocean, lake, and ice. In this way, the plants and I joined each other. They entangled me in their stems and vines and it was a beautiful entanglement. ...

[6] Some mornings as we packed our things, set out across water, the world was the color of copper, a flood of sun arrived from the east, and a thick mist rose up from black earth. Other mornings, heating water over the fire, we’d see the world covered with fog, and the birdsongs sounded forlorn and far away. There were days when we traveled as many as thirty miles. Others we traveled no more than ten. There were times when I resented the work, and days I worked so hard even Agnes’ liniment and aspirin would not relax my aching shoulders and I would crave ice, even a single chip of it, cold and shining. On other days I felt a deep contentment as I [poled](#)

¹ inside shallow currents or glided across a new wide lake.

[7] We were in the hands of nature. In these places things turned about and were other than what they seemed. In silence, I pulled through the water and saw how a river appeared through rolling fog and emptied into the lake. One day, a full-tailed fox moved inside the shadows of trees, then stepped into a cloud. New senses came to me. I was equal to the other animals, hearing as they heard, moving as they moved, seeing as they saw.

[8] One night we stayed on an island close to the decaying, moss-covered pieces of a boat. Its remains looked like the ribs of a

large animal. In the morning, sun was a dim light reaching down through the branches of trees. Pollen floated across the dark water and gathered, yellow and life-giving, along the place where water met land. . . .

[9] One evening it seemed cooler. The air had a different feel, rarefied, clean, and thin. Wolves in the distance were singing and their voices made a sound that seemed to lie upon the land, like a cloud covering the world from one edge of the horizon to the other. We sat around the fire and listened, the light on our faces, our eyes soft. Agnes warmed her hands over the flames.

[10] There was a shorter time of darkness every night, but how beautiful the brief nights, with the stars and the wolves. . . .

[11] Sometimes I felt there were eyes around us, peering through trees and fog. Maybe it was the eyes of land and creatures regarding us, taking our measure. And listening to the night, I knew there was another horizon, beyond the one we could see. And all of it was storied land, land where [deities](#)

² walked, where people traveled, desiring to be one with infinite space.

[12] We were full and powerful, wearing the face of the world, floating in silence. Dora-Rouge said, “Yes, I believe we’ve always been lost,” as we traveled through thick-grown rushes, marsh, and water so shallow our paddles touched bottom.

[13] The four of us became like one animal. We heard inside each other in a tribal way. I understood this at once and was easy with it. With my grandmothers, there was no such thing as loneliness. Before, my life had been without all its ears, eyes, without all its knowings. Now we, the four of us, all had the same eyes, and when Dora-Rouge pointed a bony finger and said, “This way,” we instinctively followed that crooked finger.

[14] I never felt lost. I felt newly found, opening, like the tiny eggs we found in a pond one day, fertile and transparent. I bent over them. The life was already moving inside them, like an eye or heartbeat. One day we passed alongside cliff walls that bore red, ancient drawings of moose and bear. These were said to have been painted not by humans, but by spirits. . . .

—Linda Hogan
excerpted from “Solar Storms,” 1995
Scribner

¹poled — propelled a boat with a pole

²deities — gods

10. **[Refer to figure 2]**

Which quotation best supports a central idea of the passage?

1. “Maybe the roots of dreaming are in the soil of dailiness” (beginning of paragraph 5)
2. “On other days I felt a deep contentment as I poled inside shallow currents or glided across a new wide lake” (last sentence of paragraph 6)
3. “The air had a different feel, rarefied, clean, and thin” (second sentence of paragraph 9)
4. “And listening to the night, I knew there was another horizon, beyond the one we could see” (middle of paragraph 11)

11. **[Refer to figure 2]**

The passage as a whole supports the theme that with

1. approval of society comes cultural freedom
2. clarity of mind comes connection of spirit
3. support of others comes environmental change
4. passage of time comes acceptance of nature

12. **[Refer to figure 2]**

The passage is primarily developed through the use of

1. rhetorical questions
2. comparison and contrast
3. parallel structure
4. personal narrative

13. [Refer to figure 2]

The language use in the last paragraph serves to

1. link the past with the future
2. continue an ongoing struggle
3. present a cultural dilemma
4. clarify the need for cooperation

14. [Refer to figure 2]

The phrase, “We were full and powerful, wearing the face of the world,” (beginning of paragraph 12) suggests that the group

1. believed they were something they were not
2. developed a kinship with the environment
3. became outwardly proud and aggressive
4. adopted a casual attitude toward nature

15. [Refer to figure 2]

The description in paragraph 7 creates a sense of

1. transformation
2. isolation
3. division
4. vindication

16. [Refer to figure 2]

Which phrase from paragraph 4 best illustrates the meaning of “tendrils” as used in the second sentence?

1. “I saw vines creeping forward” (sentence 4)
2. “there was pollen at the center” (sentence 4)
3. “Field, forest, swamp” (sentence 5)
4. “woods the wind walked through” (sentence 8)

17. [Refer to figure 2]

Read the following excerpt from the end of the second paragraph:

We were only one of the many dreams of earth. And I knew we were just a small dream.

The narrator compares people’s lives to dreams in order to illustrate the idea of

1. resourcefulness
2. individuality
3. vulnerability
4. insignificance

18. [Refer to figure 2]

Read the following excerpt from the first paragraph:

Dora-Rouge would lie on the beaver blankets and tell us what place we would pass on the next day. She’d look at the stars in the shortening night and say, “the Meeting Place,” or “God Island.” True to her word, the next day we reached those places. ...

In these lines, the narrator portrays Dora-Rouge as

1. compassionate
2. detached
3. knowledgeable
4. misguided

Figure 3

The Intelligent Plant

[1] In 1973, a book claiming that plants were [sentient](#)

¹ beings that feel emotions, prefer classical music to rock and roll, and can respond to the unspoken thoughts of humans hundreds of miles away landed on the New York Times best-seller list for nonfiction. “The Secret Life of Plants,” by Peter Tompkins and

Christopher Bird, presented a beguiling mashup of legitimate plant science, quack experiments, and mystical nature worship that captured the public imagination at a time when New Age thinking was seeping into the mainstream. The most memorable passages described the experiments of a former C.I.A. polygraph expert named Cleve Backster, who, in 1966, on a whim, hooked up a galvanometer to the leaf of a dracaena, a houseplant that he kept in his office. To his astonishment, Backster found that simply by imagining the dracaena being set on fire he could make it rouse the needle of the polygraph machine, registering a surge of electrical activity suggesting that the plant felt stress. “Could the plant have been reading his mind?” the authors ask. “Backster felt like running into the street and shouting to the world, ‘Plants can think!’” ...

[2] In the ensuing years, several legitimate plant scientists tried to reproduce the “Backster effect” without success. Much of the science in “The Secret Life of Plants” has been discredited. But the book had made its mark on the culture. Americans began talking to their plants and playing Mozart for them, and no doubt many still do. This might seem harmless enough; there will probably always be a strain of romanticism running through our thinking about plants. (Luther Burbank and George Washington Carver both reputedly talked to, and listened to, the plants they did such brilliant work with.) But in the view of many plant scientists “The Secret Life of Plants” has done lasting damage to their field. According to Daniel Chamovitz, an Israeli biologist who is the author of the recent book “What a Plant Knows,” Tompkins and Bird “[stymied](#)

² important research on plant behavior as scientists became [wary](#)³ of any studies that hinted at parallels between animal senses and plant senses.” Others contend that “The Secret Life of Plants” led to “self-censorship” among researchers seeking to explore the “possible [homologies](#)⁴ between [neurobiology](#)⁵ and [phytobiology](#)⁶”; that is, the possibility that plants are much more intelligent and much more like us than most people think—capable of [cognition](#),⁷ communication, information processing, computation, learning and memory. ...

[3] Indeed, many of the most impressive capabilities of plants can be traced to their unique [existential](#)

⁸ predicament as beings rooted to the ground and therefore unable to pick up and move when they need something or when conditions turn unfavorable. The “sessile life style,” as plant biologists term it, calls for an extensive and nuanced understanding of one’s immediate environment, since the plant has to find everything it needs, and has to defend itself, while remaining fixed in place. A highly developed sensory apparatus is required to locate food and identify threats. Plants have evolved between fifteen and twenty distinct senses, including analogues of our five: smell and taste (they sense and respond to chemicals in the air or on their bodies); sight (they react differently to various wavelengths of light as well as to shadow); touch (a vine or a root “knows” when it encounters a solid object); and, it has been discovered, sound. In a recent experiment, Heidi Appel, a chemical ecologist at the University of Missouri, found that, when she played a recording of a caterpillar chomping a leaf for a plant that hadn’t been touched, the sound primed the plant’s genetic machinery to produce defense chemicals. Another experiment, done in [Mancuso’s](#)⁹ lab and not yet published, found that plant roots would seek out a buried pipe through which water was flowing even if the exterior of the pipe was dry, which suggested that plants somehow “hear” the sound of flowing water. ...

[4] Scientists have since found that the tips of the plant roots, in addition to sensing gravity, moisture, light, pressure, and hardness, can also sense volume, nitrogen, phosphorus, salt, various toxins, microbes, and chemical signals from neighboring plants. Roots about to encounter an impenetrable obstacle or a toxic substance change course before they make contact with it. Roots can tell whether nearby roots are self or other and, if other, kin or stranger. Normally, plants compete for root space with strangers, but, when researchers put four closely related Great Lakes sea-rocket plants (*Cakile edentula*) in the same pot, the plants restrained their usual competitive behaviors and shared resources.

[5] Somehow, a plant gathers and integrates all this information about its environment, and then “decides”—some scientists deploy the quotation marks, indicating metaphor at work; others drop them—in precisely what direction to deploy its roots or its leaves. Once the definition of “behavior” expands to include such things as a shift in the [trajectory](#)

¹⁰ of a root, a reallocation of resources, or the emission of a powerful chemical, plants begin to look like much more active agents, responding to environmental cues in ways more subtle or adaptive than the word “instinct” would suggest. “Plants perceive competitors and grow away from them,” Rick Karban, a plant ecologist at U.C. Davis, explained, when I asked him for an example of plant decision-making. “They are more leery of actual vegetation than they are of inanimate objects, and they respond to potential competitors before actually being shaded by them.” These are sophisticated behaviors, but, like most plant behaviors, to an animal they’re either invisible or really, really slow.

[6] The sessile life style also helps account for plants’ extraordinary gift for biochemistry, which far exceeds that of animals and, arguably, of human chemists. (Many drugs, from aspirin to opiates, derive from compounds designed by plants.) Unable to run away, plants deploy a complex molecular vocabulary to signal distress, deter or poison enemies, and recruit animals to perform various services for them. A recent study in *Science* found that the caffeine produced by many plants may function not only as a

defense chemical, as had previously been thought, but in some cases as a psychoactive drug in their nectar. The caffeine encourages bees to remember a particular plant and return to it, making them more faithful and effective pollinators.

[7] One of the most productive areas of plant research in recent years has been plant signalling. Since the early nineteen-eighties, it has been known that when a plant's leaves are infected or chewed by insects they emit volatile chemicals that signal other leaves to mount a defense. Sometimes this warning signal contains information about the identity of the insect, gleaned from the taste of its saliva. Depending on the plant and the attacker, the defense might involve altering the leaf's flavor or texture, or producing toxins or other compounds that render the plant's flesh less digestible to herbivores. When antelopes browse acacia trees, the leaves produce tannins that make them unappetizing and difficult to digest. When food is scarce and acacias are overbrowsed, it has been reported, the trees produce sufficient amounts of toxin to kill the animals. ...

[8] All species face the same existential challenges—obtaining food, defending themselves, reproducing—but under wildly varying circumstances, and so they have evolved wildly different tools in order to survive. Brains come in handy for creatures that move around a lot; but they're a disadvantage for ones that are rooted in place. Impressive as it is to us, self-consciousness is just another tool for living, good for some jobs, unhelpful for others. That humans would rate this particular adaptation so highly is not surprising, since it has been the shining destination of our long evolutionary journey, along with the epiphenomenon of self-consciousness that we call “free will.” ...

—Michael Pollan
excerpted from “The Intelligent Plant”
The New Yorker, December 23 & 30, 2013

¹sentient — conscious

²stymied — prevented

³wary — cautious

⁴homologies — similarities

⁵neurobiology — the study of the nervous system

⁶phytobiology — the study of plants

⁷cognition — understanding

⁸existential — relating to existence

⁹Mancuso — Stefano Mancuso, Italian plant physiologist

¹⁰trajectory — a path

19. **[Refer to figure 3]**

The text's credibility relies on the author's use of

1. order of importance
2. extended comparison
3. observable evidence
4. personal anecdotes

20. **[Refer to figure 3]**

The final paragraph contributes to a central idea by suggesting that

1. humans have acquired superior characteristics
2. species develop according to their own needs
3. plants would benefit from having self-awareness
4. scientists have dismissed important findings

21. **[Refer to figure 3]**

The term “plant signalling” (paragraph 7) refers to the way plants

1. reproduce with similar species
2. protect themselves from predators
3. react to human contact
4. adapt themselves to climate

22. **[Refer to figure 3]**

Read the following excerpt from paragraph 6:

A recent study in Science found that the caffeine produced by many plants may function not only as a defense chemical, as had previously been thought, but in some cases as a psychoactive drug in their nectar. The caffeine encourages bees to remember a particular plant and return to it, making them more faithful and effective pollinators.

The evidence provided in the excerpt above demonstrates that plants may

1. develop symbiotic relationships
2. attack weaker organisms
3. waste essential resources
4. produce genetic mutations

23. **[Refer to figure 3]**

Read the following excerpt from paragraph 5:

Once the definition of “behavior” expands to include such things as a shift in the trajectory of a root, a reallocation of resources, or the emission of a powerful chemical, plants begin to look like much more active agents, responding to environmental cues in ways more subtle or adaptive than the word “instinct” would suggest.

The excerpt above supports a central idea in the text suggesting that plants

1. resist cooperation
2. avoid modification
3. produce sound
4. possess intent

24. **[Refer to figure 3]**

In paragraph 5, the use of quotation marks around the words “decides” and “behavior” acknowledges the presence of

1. deception
2. debate
3. confusion
4. resentment

25. [Refer to figure 3]

Read the following excerpt from paragraph 3:

Plants have evolved between fifteen and twenty distinct senses, including analogues of our five: smell and taste (they sense and respond to chemicals in the air or on their bodies); sight (they react differently to various wavelengths of light as well as to shadow); touch (a vine or a root “knows” when it encounters a solid object); and, it has been discovered, sound.

A primary purpose of the details above is to indicate a connection

1. among diverse plant species
2. among several independent studies
3. between humans and plants
4. between predators and prey

26. [Refer to figure 3]

Read the following sentences from paragraph 2:

Much of the science in “The Secret Life of Plants” has been discredited. But the book had made its mark on the culture.

Based on the context of paragraph 2 as a whole, the author’s use of the word “But” in the sentences above serves to

1. express the controversial nature of “The Secret Life of Plants”
2. compare “The Secret Life of Plants” with “What a Plant Knows”
3. express the similarities between certain types of plants
4. compare the learning ability of particular types of plants

27. [Refer to figure 3]

The details in the first paragraph serve mainly to establish the

1. relationship between plant science and musical trends
2. difference between houseplants and wild plants
3. importance of forensic science for theories of plant behavior
4. impact of early studies of plant behavior on current research

28. [Refer to figure 3]

The first paragraph conveys a sense of

1. caution
2. accusation
3. excitement
4. relief

Figure 4

A Wagner Matinée

[1] I received one morning a letter, written in pale ink on glassy, blue-lined note-paper, and bearing the postmark of a little Nebraska village. This communication, worn and rubbed, looking as if it had been carried for some days in a coat pocket that was none too clean, was from my uncle Howard, and informed me that his wife had been left a small legacy by a bachelor relative, and that it would be necessary for her to go to Boston to attend to the settling of the estate. He requested me to meet her at the station and render her whatever services might be necessary. On examining the date indicated as that of her arrival, I found it to be no later than tomorrow. He had characteristically delayed writing until, had I been away from home for a day, I must have missed my aunt altogether. ...

[2] Whatever shock Mrs. Springer [the landlady] experienced at my aunt’s appearance, she considerably concealed. As for myself, I saw my aunt’s battered figure with that feeling of awe and respect with which we behold explorers who have left their ears and fingers north of [Franz-Joseph-Land](#)

¹ or their health somewhere along the Upper Congo. My Aunt Georgiana had been a music teacher at the Boston Conservatory, somewhere back in the latter sixties [1860s]. One summer, while visiting in the little village among the Green Mountains where her

ancestors had dwelt for generations, she had kindled the [callow](#)² fancy of my uncle, Howard Carpenter, then an idle, shiftless boy of twenty-one. When she returned to her duties in Boston, Howard followed her, and the upshot of this infatuation was that she eloped with him, eluding the reproaches of her family and the criticism of her friends by going with him to the Nebraska frontier. Carpenter, who, of course, had no money, took up a homestead in Red Willow County, fifty miles from the railroad. There they had measured off their land themselves, driving across the prairie in a wagon, to the wheel of which they had tied a red cotton handkerchief, and counting its revolutions. They built a dug-out in the red hillside, one of those cave dwellings whose inmates so often reverted to primitive conditions. Their water they got from the lagoons where the buffalo drank, and their slender stock of provisions was always at the mercy of bands of roving Indians. For thirty years my aunt had not been farther than fifty miles from the homestead.

[3] I owed to this woman most of the good that ever came my way in my boyhood, and had a [reverential](#)

³ affection for her. During the years when I was riding herd for my uncle, my aunt, after cooking the three meals — the first of which was ready at six o'clock in the morning — and putting the six children to bed, would often stand until midnight at her ironing-board, with me at the kitchen table beside her, hearing me recite Latin declensions and conjugations, gently shaking me when my drowsy head sank down over a page of irregular verbs. It was to her, at her ironing or mending, that I read my first Shakspeare, and her old text-book on mythology was the first that ever came into my empty hands. She taught me my scales and exercises on the little parlour organ which her husband had bought her after fifteen years during which she had not so much as seen a musical instrument. She would sit beside me by the hour, darning and counting, while I struggled with the “Joyous Farmer.” She seldom talked to me about music, and I understood why. Once when I had been doggedly beating out some easy passages from an old score of Euryanthe I had found among her music books, she came up to me and, putting her hands over my eyes, gently drew my head back upon her shoulder, saying tremulously, “Don’t love it so well, Clark, or it may be taken from you.” . . .

[4] At two o'clock the Symphony Orchestra was to give a Wagner program, and I intended to take my aunt; though, as I conversed with her, I grew doubtful about her enjoyment of it. I suggested our visiting the Conservatory and the Common before lunch, but she seemed altogether too timid to wish to venture out. She questioned me absently about various changes in the city, but she was chiefly concerned that she had forgotten to leave instructions about feeding half-skimmed milk to a certain weakling calf, “old Maggie’s calf, you know, Clark,” she explained, evidently having forgotten how long I had been away. She was further troubled because she had neglected to tell her daughter about the freshly-opened [kit of mackerel](#)

⁴ in the cellar, which would spoil if it were not used directly. . . .

[5] The first number [of the concert] was the [Tannhauser](#)

⁵ overture. When the horns drew out the first strain of the Pilgrim’s chorus, Aunt Georgiana clutched my coat sleeve. Then it was I first realized that for her this broke a silence of thirty years. With the battle between the [motives](#),⁶ with the frenzy of the Venusberg theme and its ripping of strings, there came to me an overwhelming sense of the waste and wear we are so powerless to combat; and I saw again the tall, naked house on the prairie, black and grim as a wooden fortress; the black pond where I had learned to swim, its margin pitted with sun-dried cattle tracks; the rain gullied clay banks about the naked house, the four dwarf ash seedlings where the dish-cloths were always hung to dry before the kitchen door. The world there was the flat world of the ancients; to the east, a cornfield that stretched to daybreak; to the west, a corral that reached to sunset; between, the conquests of peace, dearer-bought than those of war. . . .

[6] Her lip quivered and she hastily put her handkerchief up to her mouth. From behind it she murmured, “And you have been hearing this ever since you left me, Clark?” Her question was the gentlest and saddest of reproaches. . . .

[7] The deluge of sound poured on and on; I never knew what she found in the shining current of it; I never knew how far it bore her, or past what happy islands. From the trembling of her face I could well believe that before the last number she had been carried out where the myriad graves are, into the grey, nameless burying grounds of the sea; or into some world of death vaster yet, where, from the beginning of the world, hope has lain down with hope and dream with dream and, renouncing, slept. . . .

[8] I spoke to my aunt. She burst into tears and sobbed pleadingly. “I don’t want to go, Clark, I don’t want to go!”

[9] I understood. For her, just outside the concert hall, lay the black pond with the cattle-tracked bluffs; the tall, unpainted house, with weather-curved boards, naked as a tower; the crook-backed ash seedlings where the dish-cloths hung to dry; the gaunt, moulting turkeys picking up refuse about the kitchen door.

—Willa Cather
excerpted and adapted from “A Wagner Matinée”
Youth and the Bright Medusa, April 1920

¹Franz-Joseph-Land — Russian archipelago of 191 islands in the Arctic Ocean

²callow — naive

³reverential — with great honor and respect

⁴kit of mackerel — container of fish

⁵Tannhauser — an opera by Richard Wagner

⁶motives — recurrent musical phrases

29. **[Refer to figure 4]**

The author's choice of how to end the story (paragraphs 8 and 9) places emphasis on Aunt Georgiana's

1. bleak future
2. unusual lifestyle
3. domestic skills
4. hostile attitude

30. **[Refer to figure 4]**

Read the following excerpt from paragraph 4:

She questioned me absently about various changes in the city, but she was chiefly concerned that she had forgotten to leave instructions about feeding half-skimmed milk to a certain weakling calf, "old Maggie's calf, you know, Clark," she explained, evidently having forgotten how long I had been away. She was further troubled because she had neglected to tell her daughter about the freshly-opened kit of mackerel in the cellar, which would spoil if it were not used directly. ...

The excerpt above contributes to a central idea by depicting Aunt Georgiana's

1. concern for daily responsibilities
2. desire for cultural experiences
3. fear of future separations
4. fixation on painful memories

31. **[Refer to figure 4]**

In paragraph 3, when the narrator states that he "understood why," he is implying that his Aunt Georgiana

1. knew little about current musical trends
2. avoided talking about his musical skills
3. realized what she has given up
4. needed some recognition of her ability

32. **[Refer to figure 4]**

Read the following sentence from paragraph 3:

She taught me my scales and exercises on the little parlour organ which her husband had bought her after fifteen years during which she had not so much as seen a musical instrument.

The sentence above develops a central theme by

1. recalling the husband's generosity in supporting the narrator's music lessons
2. suggesting that the narrator resented his music lessons
3. emphasizing the role of discipline in developing Aunt Georgiana's musical talent
4. implying that Aunt Georgiana missed having music in her life

33. **[Refer to figure 4]**

The statement at the end of paragraph 2, "For thirty years my aunt had not been farther than fifty miles from the homestead" reinforces a sense of

1. discomfort
2. happiness
3. isolation
4. affection

34. [Refer to figure 4]

Read the following excerpt from paragraph 2:

My Aunt Georgiana had been a music teacher at the Boston Conservatory, somewhere back in the latter sixties [1860s]. One summer, while visiting in the little village among the Green Mountains where her ancestors had dwelt for generations, she had kindled the callow fancy of my uncle, Howard Carpenter, then an idle, shiftless boy of twenty-one. When she returned to her duties in Boston, Howard followed her, and the upshot of this infatuation was that she eloped with him, eluding the reproaches of her family and the criticism of her friends by going with him to the Nebraska frontier.

The details in the excerpt above suggest that in her youth Aunt Georgiana was

1. courageous yet hesitant
2. compassionate yet critical
3. resourceful yet cautious
4. intelligent yet impulsive

35. [Refer to figure 4]

In the first paragraph, the commentary about the letter implies that the narrator believes his uncle is

1. uncomfortable with changes
2. careless about details
3. angry with his wife
4. disappointed at his decision

36. [Refer to figure 4]

A primary function of the first paragraph is to

1. establish the reason for the meeting
2. create an atmosphere of mystery
3. identify preferences of the narrator's aunt
4. reveal flaws in the narrator's character

Figure 5

Excerpt from “The Russell–Einstein Manifesto”

“The Russell–Einstein Manifesto,” signed by a group of eleven intellectuals and scientists including Bertrand Russell and Albert Einstein, was written at the height of the Cold War.

[1] In the tragic situation which confronts humanity, we feel that scientists should assemble in conference to appraise the perils that have arisen as a result of the development of weapons of mass destruction, and to discuss a resolution in the spirit of the appended draft.

[2] We are speaking on this occasion, not as members of this or that nation, continent, or creed, but as human beings, members of the species Man, whose continued existence is in doubt. The world is full of conflicts; and, overshadowing all minor conflicts, the titanic struggle between Communism and anti-Communism. . . .

[3] We have to learn to think in a new way. We have to learn to ask ourselves, not what steps can be taken to give military victory to whatever group we prefer, for there no longer are such steps; the question we have to ask ourselves is: what steps can be taken to prevent a military contest of which the issue must be disastrous to all parties? . . .

[4] No doubt in an [H-bomb](#)

¹ war great cities would be obliterated. But this is one of the minor disasters that would have to be faced. If everybody in London, New York, and Moscow were exterminated, the world might, in the course of a few centuries, recover from the blow. But we now know, especially since the [Bikini test](#)² that nuclear bombs can gradually spread destruction over a very much wider area than had been supposed. . . .

[5] Many warnings have been uttered by eminent men of science and by authorities in military strategy. None of them will say that the worst results are certain. What they do say is that these results are possible, and no one can be sure that they will not be

realized. We have not yet found that the views of experts on this question depend in any degree upon their politics or prejudices. They depend only, so far as our researches have revealed, upon the extent of the particular expert's knowledge. We have found that the men who know most are the most gloomy.

[6] Here, then, is the problem which we present to you, stark and dreadful and inescapable: Shall we put an end to the human race; or shall mankind renounce war? People will not face this alternative because it is so difficult to abolish war.

[7] The abolition of war will demand distasteful limitations of national sovereignty. But what perhaps impedes understanding of the situation more than anything else is that the term "mankind" feels vague and abstract. People scarcely realize in imagination that the danger is to themselves and their children and their grandchildren, and not only to a dimly apprehended humanity. They can scarcely bring themselves to grasp that they, individually, and those whom they love are in [imminent](#)

³ danger of perishing agonizingly. And so they hope that perhaps war may be allowed to continue provided modern weapons are prohibited.

[8] This hope is illusory. Whatever agreements not to use H-bombs had been reached in time of peace, they would no longer be considered binding in time of war, and both sides would set to work to manufacture H-bombs as soon as war broke out, for, if one side manufactured the bombs and the other did not, the side that manufactured them would inevitably be victorious.

[9] Although an agreement to renounce nuclear weapons as part of a general reduction of armaments would not afford an ultimate solution, it would serve certain important purposes. First: any agreement between East and West is to the good in so far as it tends to diminish tension. Second: the abolition of thermo-nuclear weapons, if each side believed that the other had carried it out sincerely, would lessen the fear of a sudden attack in the style of Pearl Harbour, which at present keeps both sides in a state of nervous apprehension. We should, therefore, welcome such an agreement, though only as a first step.

[10] Most of us are not neutral in feeling, but, as human beings, we have to remember that, if the issues between East and West are to be decided in any manner that can give any possible satisfaction to anybody, whether Communist or anti-Communist, whether Asian or European or American, whether White or Black, then these issues must not be decided by war. We should wish this to be understood, both in the East and in the West.

[11] There lies before us, if we choose, continual progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings: Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death.

Resolution

[12] We invite this [Congress](#)

⁴ and through it the scientists of the world and the general public, to subscribe to the following resolution:

[13] "In view of the fact that in any future world war nuclear weapons will certainly be employed, and that such weapons threaten the continued existence of mankind, we urge the Governments of the world to realize, and to acknowledge publicly, that their purpose cannot be furthered by a world war, and we urge them, consequently, to find peaceful means for the settlement of all matters of dispute between them."

—Bertrand Russell
excerpted from "The Russell–Einstein Manifesto"
July 9, 1955

¹H-bomb — hydrogen bomb

²Bikini test — reference to an American test of a hydrogen bomb conducted at the Bikini Atoll in the Pacific Ocean on March 1st, 1954. The bomb sent radioactive debris across the globe.

³imminent — about to take place

⁴Congress — the group of scientists who signed the Manifesto

37. [Refer to figure 5]

The Manifesto states that the presence of nuclear weapons requires individuals to

1. advocate for international conflict resolution
2. elect politicians who will support disarmament
3. participate in public discussions about the military
4. prepare the communities for nuclear attack

38. **[Refer to figure 5]**

The “Resolution” stated in paragraphs 12 through 13 serves to

1. advise the Congress to debate the proposal
2. stress the importance of non-military solutions to conflicts
3. demand the elimination of weapons of mass destruction
4. condemn the Governments that violate the Manifesto

39. **[Refer to figure 5]**

Which statement from the text is best supported by paragraph 10?

1. “We have found that the men who know most are the most gloomy” (paragraph 5)
2. “The abolition of war will demand distasteful limitations of national sovereignty” (paragraph 7)
3. “And so they hope that perhaps war may be allowed to continue provided modern weapons are prohibited” (paragraph 7)
4. “Remember your humanity, and forget the rest” (paragraph 11)

40. **[Refer to figure 5]**

Paragraph 9 suggests that a potential agreement on weaponry would be

1. successful
2. controversial
3. unpopular
4. helpful

41. **[Refer to figure 5]**

As used in paragraph 8, the word “illusory” most closely means

1. deceptive
2. sustainable
3. regrettable
4. certain

42. **[Refer to figure 5]**

The phrase “dimly apprehended” (paragraph 7) suggests that average people’s understanding of the concept of mankind is

1. realistic
2. limited
3. pessimistic
4. insightful

43. **[Refer to figure 5]**

The rhetorical question posed in paragraph 6 emphasizes the

1. unavoidable nature of the problem
2. important issue of national sovereignty
3. likely elimination of weapons of mass destruction
4. probable establishment of a new world power

44. **[Refer to figure 5]**

Paragraph 5 helps to refine the central idea in the text by

1. including statements that express opposing points of view
2. providing a summary of the opinions of experts in this area
3. encouraging individuals to become involved with the cause
4. opposing an involvement by politicians and scientists

Figure 6

P.T. Barnum

“There’s a sucker born every minute.”

[1] The cynical quote above has been long attributed to Phineas Taylor Barnum, better known as P.T. Barnum, famed American showman. But, as is so often the case in the matter of famous quotes said by famous people, there is no record of the man himself

uttering the words, though it's understandable that some would "credit" Barnum with the sentiment.

[2] To those who know the name, P.T. Barnum was the founder of the circus that became -- after he joined forces with another showman -- Barnum & Bailey's, the biggest circus in the world, and the first one to present three rings of jaw-dropping entertainment. But Barnum didn't get into the circus business until late in life. What he did get into before that was, however, quite impressive, though not always of the highest ethical standards.

[3] As a young man in Connecticut, Barnum ran a number of businesses, most profitably a statewide lottery network. He was active in local politics and started a newspaper that he used to promote views that were contrary to church elders in the area who wished to restrict gambling and travel. He was even sent to jail for two months for editorials that he had written expressing his views on these subjects. In 1834, lotteries were made illegal in Connecticut, and Barnum was forced to look for other work. He moved to New York, where he began his career as a showman. His first "exhibit" was Joice Heth, a blind and almost completely paralyzed slave woman who Barnum claimed was George Washington's nurse and 161 years old. Posters from that day call her, in a style that would become Barnum's trademark, "The Greatest Natural & National Curiosity in the World." When some people expressed doubt regarding her age, Barnum promised that after she died she would be examined. It wasn't long before Heth did pass away, and Barnum set up a public autopsy in New York City's Saloon. When the medical examiner declared the age claim a fraud, Barnum said that the body wasn't actually that of Heth, who was still alive, touring Europe. It should be noted that Barnum charged the 1500 people in attendance fifty cents a piece.

[4] In 1841, Barnum bought a museum of sorts. It actually housed a motley collection of animals -- live and stuffed -- wax figures, assorted items from Africa and Asia, and other "curiosities." Barnum fixed the five-story building up, illuminating it at night with the recently invented limelight, and covering it with banners and flags. Barnum promised the folks that inside was good wholesome entertainment, but he knew that people wanted something sensational and he provided it in spades. Besides the animals, there were magicians, giants, midgets, the famous Siamese (conjoined) twins Chang and Eng, a flea circus, a "mummified mermaid," pretty baby contests, the trunk of a tree under which Jesus' disciples sat, and a weaving loom operated by a dog. Some of these attractions may have actually been legitimate.

[5] The circus was a huge success, open 15 hours a day during which as many as 15,000 visitors would each pay twenty-five cents to gain admission. When Barnum saw that people were spending too long inside, he posted signs saying "This Way to Egress." Not realizing that "egress" meant "exit," spectators would make their way to what they believed to be another attraction only to find themselves outside. In 1865, a huge fire burned the building to the ground. Animals leaped from the burning building and were then shot by police officers concerned about public safety. Even in disaster, Barnum put on a wild show.

[6] Perhaps the best known of Barnum's human attractions was General Tom Thumb, who began working for Barnum at the age of four, though Barnum claimed he was 11 at the time. The General was actually Charles Stratton, a little person who (though he later was to grow to a height of almost 3 ½ feet), was, at the time, only 25 inches tall. Barnum taught him to sing and dance and to impersonate famous figures such as Cupid and Napoleon. Stratton was a sensation; he and Barnum toured Europe where they were the guests of royalty. (Later, at the age of 25, Stratton, now quite rich, married Lavinia Warren, another little person. After the ceremony, the couple was received by President Lincoln at the White House.)

[7] The name P.T. Barnum was now firmly associated in the public's mind with thrilling entertainment and dubious claims. But the man himself apparently wanted to be thought of as someone who also provided "upscale" entertainment of a more "uplifting" sort. This wish might have been motivated by profit as much as a yearning for a more elevated status, but Barnum did present himself as a true "impresario" with his newest star in 1850, the soprano Jenny Lind. Known as "The Swedish Nightingale," Lind was a truly talented opera singer with a reputation for shyness, sincerity, and philanthropy, all of which suited Barnum's new approach nicely. Barnum offered her \$1000 a night to perform in the U.S. for 150 nights, all expenses paid. Lind said she'd agree only if she was paid in advance so that she could give a large sum to the charities she supported. Barnum agreed, borrowing heavily to afford this enormous figure.

[8] Barnum used all his promotional savvy to ensure that Lind was a celebrity in the U.S. even before she arrived. (Having dozens of journalists on his payroll helped in this respect.) When she did dock, nearly 40,000 people awaited her, and about half that number were stationed outside her hotel. Lind saw just how much money Barnum stood to make and demanded that her contract be altered so that she would receive a large percentage of the profits which, again, would go to her beloved charities, especially one for poor children back in Sweden. Her first concert was a huge success, and the press coined the term "Lind mania." The singer was disturbed at the commercialism of the whole enterprise and convinced Barnum to set aside a certain number of tickets at a reduced price. After 93 concerts, Lind, tired of the constant marketing of the tour, got out of her contract with Barnum and continued on her own. Apparently there were no hard feelings between the two. Lind earned about \$350,000 during her time with Barnum, while he pocketed about half a million.

[9] Next, Barnum wanted to change the general impression that many Americans had of theatres being sordid, dangerous places, unfit for families. Accordingly he built the largest theater in New York, naming it, with his characteristic lack of subtlety, the “Moral Lecture Room.” The temperance movement was a force to be dealt with at this time, and the first production that Barnum – who had himself given up alcohol -- staged at the theater was *The Drunkard*, a play that made clear the evils of liquor consumption. This was followed by other respectable productions cast with well-regarded actors. Shakespeare (modified to make it more family-friendly) was put on, as were plays with historical themes.

[10] In 1850, Barnum’s fortunes plunged. The famous showman made loans to a business that went bankrupt, virtually cleaning him out. Some people, including author Ralph Waldo Emerson, believed that Barnum’s fall was payback for his questionable approach to showmanship and the kinds of acts he often presented. After several years, thanks in part to financial assistance from “Tom Thumb,” Barnum was back on his feet, adding the country’s first aquarium to a museum he still owned. When the Civil War started, he added Unionist attractions, including an actress who had been a spy for the North and who gave thrilling lectures about her adventures behind enemy lines.

[11] Barnum did not enter the circus business until he was 61, when he and William Cameron Croup created “P.T. Barnum’s Grand Traveling Museum, Menagerie, Caravan, & Hippodrome.” After joining forces with Bailey, this became “P.T. Barnum’s Greatest Show On Earth, And The Great London Circus, Sanger’s Royal British Menagerie and The Grand International Allied Shows United.” The biggest attraction – in both senses of the word— was Jumbo the elephant. Tom Thumb was there as well, as were individuals who, because of their unusual physical characteristics -- the so-called Dog-faced Boy was one example -- were billed as “freaks,” a term that we now think of as cruel and dehumanizing. Barnum himself, now world-famous, got into the act, riding around the arena in a chariot before each show.

[12] It’s an interesting irony that Barnum of all people objected to what he considered fraudulent claims. He made a distinction between his brand of hype (or, as he called it, humbug), which he considered harmless publicity, and the spiritualists and mediums of the day who claimed that they could communicate with the dead – for a price. He even showed up in court to testify against a “spirit photographer” and went so far as to offer \$500 to anyone who could conclusively demonstrate an ability to communicate with the deceased.

[13] Though he claimed to find politics “distasteful,” Barnum was active in opposing slavery, and his activism led to his winning office as representative to the Connecticut legislature from Fairfield, Connecticut. Speaking before the legislature, he said,

[14] *“A human soul, ‘that God has created and Christ died for,’ is not to be trifled with. It may tenant the body of a Chinaman, a Turk, an Arab or a Hottentot – it is still an immortal spirit.”*

[15] Barnum later ran for Congress but lost. In 1875, he became mayor of Bridgeport, CT and helped create Bridgeport Hospital. Though he claimed not to be very interested in philanthropy for its own sake, he contributed to a number of causes, most notably by donating \$50,000 – that’s about \$2 million in 2013 dollars – to Tufts University’s Department of Natural History. As a result of his gift, Jumbo the elephant became the school’s mascot, and Tuft’s students are known as “Jumbos.”

[16] At the time of his death in 1890, Barnum was perhaps the most famous American in the world. Whatever annoyance people might have felt about him and his outrageous style of promotion seemed to have dissipated, and the man was seen as a symbol of American ingenuity and business know-how. This was a man who must have loved seeing his name in the paper, because shortly before he died he asked the Evening Sun to print his obituary so he could read it.

[17] Whatever his strengths and weaknesses, Barnum, who made no attempt to disguise his love of money, also loved to show people a good time. In a time before radio, television, and the movies, he put millions of smiles on millions of faces. This was a man who knew himself well. In an eventful life that took him to the royal palaces of Europe, he knew that he was at heart a showman. As he put it: *“I am a showman by profession...and all the gilding shall make nothing else of me”*.

45. [Refer to figure 6]

What is the author’s purpose in quoting from Barnum’s speech to the Connecticut legislature, paragraphs 13 and 14 ?

1. To show that Barnum knew how to give a rousing speech
2. To show that Barnum was opposed to slavery
3. To show that Barnum was interested in local politics
4. To show that Barnum was well educated.

46. [Refer to figure 6]

According to the passage, which of the following positions did Barnum hold? Select all that apply.

- U.S. Congressman
- Mayor
- Theater director
- Founder of first circus in United States
- Newspaper editor

47. [Refer to figure 6]

Which of the following best describes the tone of the passage?

1. Objective
2. Admiring
3. Humorous
4. Inspirational

48. [Refer to figure 6]

Which of the following would the author consider typical of Barnum? Select all that apply.

- Charging people to witness Joice Heth's autopsy.
- Agreeing to Jenny Lind's demands that some tickets be sold at a discounted price.
- Presenting Tom Thumb as an eleven-year old when he was actually much younger.
- Claiming that one of his entertainers could miraculously make contact with "departed spirits."
- Paying newspaper journalists to write positive articles about his shows even if they hadn't been in attendance.

49. [Refer to figure 6]

In paragraph 4, the author describes Barnum's museum by stating, "It actually housed a *motley* collection of animals - live and stuffed - wax figures, assorted items from Africa and Asia, and other 'curiosities.'"

What does *motley* mean as used in this passage?

1. humorous
2. wonderful
3. expensive
4. assorted

50. [Refer to figure 6]

Why did Barnum spend two months in jail?

1. For publishing a newspaper that criticized local politicians.
2. For printing his views regarding several issues, including gambling
3. For gambling
4. For running a state lottery

Figure 7

Text

[1] For countless American children, breakfast or lunch drops out of a vending machine at school: a can of soda, perhaps, washing down a chocolate bar or a bag of potato chips.

[2] Now, a growing number of states are striking back, trying to curb the rise in childhood obesity by placing strict limits on the sale of candy, soft drinks and fatty snacks in schools. Nearly a dozen states are considering legislation to turn off school vending machines during class time, strip them of sweets or impose new taxes on soft drinks to pay for teacher salaries and breakfast programs.

[3] In California, legislators appear close to passing a law that would prohibit any drinks but milk, water or juice from being sold in elementary schools, and curtail the hours older students can fuel up at vending machines. In Hawaii, legislators are pushing to oust sodas from school machines altogether.

[4] The wave of legislation, unusual both for its breadth and its assertiveness, grew out of the newest statistics on child obesity from the Centers for Disease Control and Prevention. Teenagers today are almost three times as likely to be overweight as they were 20 years ago, the agency announced this year, prompting many lawmakers to take aim at the junk food they believe is to blame.

[5] “It can’t help when a child is eating chips and soda at 8 in the morning,” said Martha Escutia, a state senator who backed California’s bill.

[6] The food industry says children need more exercise, not fewer choices. The bills have also angered school administrators nationwide, intensifying an already heated debate over the prevalence of commercialism in the education system.

[7] Once little more than a novelty in schools, vending machines have become a principal source of extra money for districts across the nation, bringing in hundreds of millions of dollars for extracurricular activities each year. With dozens of machines lining their hallways, some schools annually earn \$50,000 or more in commissions, then use the money for marching bands, computer centers and field trips that might otherwise fall by the wayside.

[8] To keep such programs going, schools are emerging as the staunchest opponents of the proposed restrictions, invoking the same principles of local control that the states themselves use to fight federal standards for academic testing. In many cases, the resistance from schools has been [vociferous](#)

¹ enough to water down or defeat measures, or at least stall them until the next legislative session rolls around.

[9] “Let the parents, the students and the school community sit down and decide how to handle this,” said Robert E. Meeks, legislative director for the Minnesota School Boards Association, which has organized against legislation to curtail soda sales. Mr. Meeks added that Minnesota schools earn roughly \$40 million a year from vending machines. “The states only seem to be interested in local control when it suits them,” he said.

[10] Many lawmakers say they find it odd that educators are their biggest foes, considering that the schools are supposed to look after the welfare of their students. [10]

[11] Half the students in some Texas and California districts are overweight, officials say.

[12] “I can understand why school districts go in search of extra resources,” said Jaime L. Capelo Jr., a state representative in Texas who introduced a measure to pare down the amount of junk food in schools. “But it’s shameful when they obtain additional resources through contracts with soda companies with little or no regard to the health of their students.”

[13] Even some students express concern over the abundance of snack foods in their schools. Nell S. Geiser, a 17-year-old senior at New Vista High School in Boulder, Colo., says the vending machines in the building never shut down. At 7:30 a.m., outside classrooms with corporate symbols like I.B.M. painted on the walls, she says her fellow students gather in front of the humming machines, comparing schedules on daily planners with logos of the WB network, courtesy of a local television station.

[14] “Plenty of kids make their breakfast from a Mountain Dew and a bag of Doritos,” said Nell, who organizes fellow students to oppose soda contracts in schools. “You’re brought up thinking it’s all right to be constantly bombarded with ads and junk food because they’re in your school.”

[15] Educators, in turn, say that it is the lawmakers who are hypocritical, because as tax revenues sag in tandem with the economy, state legislatures are cutting school budgets, leaving districts with few choices but to search for substitute funds.

[16] “Maybe it’s not the best way of making money,” said Paul D. Houston, executive director of the American Association of School Administrators. “But who is responsible for providing funding for schools? The very people who are now saying that we can’t engage in creative ways of raising money.”

[17] Though they are often sympathetic to the economic woes of school districts, many lawmakers argue that encouraging children to indulge at an early age is ultimately fiscally irresponsible. As students become heavier and their health deteriorates, more serious ailments like diabetes can arise, leading to higher health care costs over time. . . .

[18] The Department of Agriculture tried to ban soda and candy sales in schools more than two decades ago, but was thwarted by a federal appeals court in 1983. Now, federal regulations simply require schools to turn off soda and candy machines in the cafeteria during meal times. Those that sit outside in the hallways can stay on all day.

[19] Several states go further. New York, which, like a handful of other states, is considering ways to increase exercise in schools, already prohibits food of “minimal nutritional value” from being sold until after lunch. New Jersey and Maryland have similar policies. But lawmakers say that such rules often make little difference.

[20] “They’re totally ignored,” said Paul G. Pinsky, a state senator in Maryland and former high school teacher who introduced a bill this year to switch off vending machines during the school day. “After the sugar high wore off and they were finished bouncing off the walls, my students’ heads would fall on the desk,” he said. “It made it really difficult to teach.”

[21] Part of the problem, legislators say, is that the agreements between schools and soda companies sometimes deter principals from following state policy, especially since how much schools make is often tied to how much they sell.

[22] One contract between the Pepsi-Cola Company and the Montgomery Blair High School in Silver Spring, Md., stated that “if

the Board of Education actively enforces the policy in which vending machines are turned off during the school day,” the school will not get its guaranteed commission. But the company is now taking a more conciliatory stand. Officials of Pepsi, a unit of PepsiCo, say they have redrawn the contract and others like it over the last year, so that they reflect what the company calls the “spirit and the letter” of state policies.

[23] In other states, legislators question whether schools have disregarded state guidelines simply by allowing soda machines on campus. In recent years, North Carolina schools have signed vending contracts with soft drink companies, even though the state’s official policy allows only sales that “contribute to the nutritional well-being of the child and aid in establishing good food habits.”

[24] “It’s a bit of a conflict, isn’t it?” said Ellie G. Kinnaird, a state senator in North Carolina who is seeking a moratorium on soft drink contracts in schools.

[25] Six months ago, the Coca-Cola Company said that it would scale back on binding contracts with schools. But the new guidelines do not pertain to existing contracts, and may not affect future ones either.

[26] On average, Americans drink nearly 60 gallons of soda each year, almost 8 gallons more than they did just 10 years ago. For many lawmakers, it is a given that the increase has worsened childhood obesity. To the food industry, assigning the blame to any one type of food is simplistic.

[27] “There are no such things as good foods and bad foods,” said Chip Kunde, a legislative director for the Grocery Manufacturers of America, a food industry trade group. “There are just good diets and bad diets.”

[28] Researchers [vacillate](#)

², pointing out that children are eating more of almost everything, not just sweets, while exercising less. In fact, only 29 percent of students attended daily physical education classes in 1999, compared with 42 percent in 1991, according to the Centers for Disease Control and Prevention, making it harder for them to burn off the extra calories they have put on.

¹ vociferous — characterized by an insistent outcry

² vacillate — change point of view

— Greg Winter

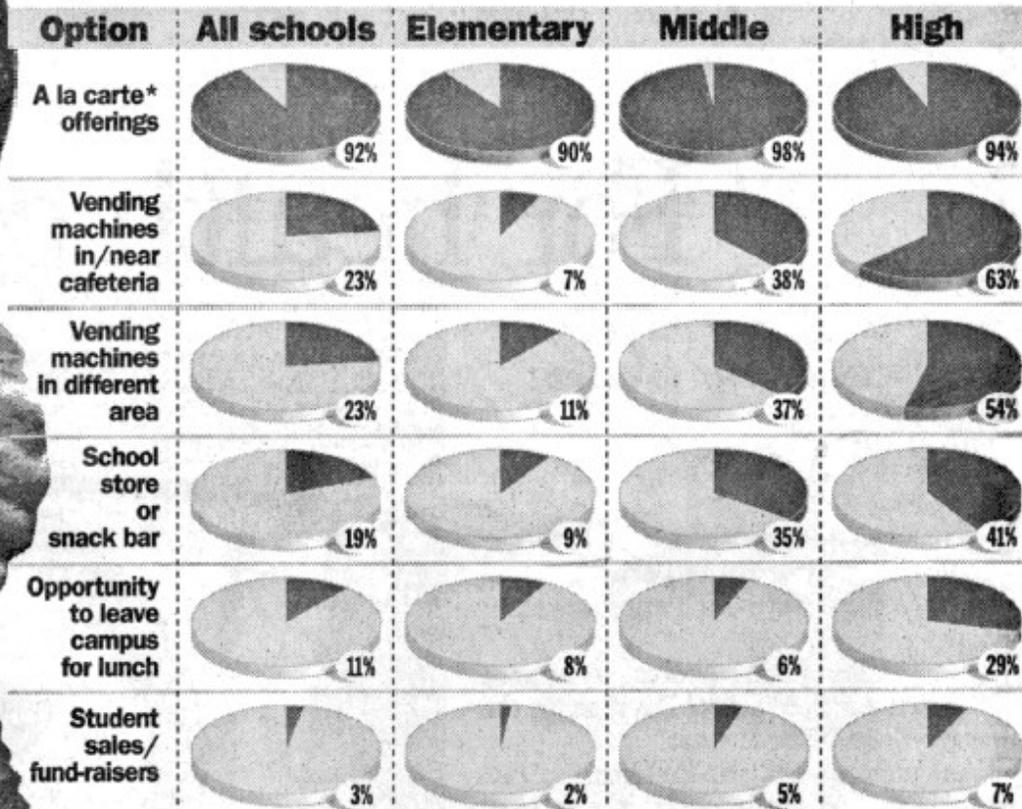
excerpted from “States Try to Limit Sales of Junk Food in School Buildings”

The New York Times, September 9, 2001

Chart

Students have choices

Percentage of schools offering food in addition to the National School Lunch Program during school hours:



* A la carte offerings are any foods sold in the cafeteria that are not part of the National School Lunch Program menu of the day. These include items such as pizzas, candy, french fries and milk or other items purchased to consume with a lunch brought from home.

Source: USDA Food and Nutrition Service, "School Nutrition Dietary Assessment Study II", April 2001 and Jeff Boyer/*Times Union*

51. [Refer to figure 7]

Directions:

Read the text, study the chart, and write a response based on the situation described below.

The Situation:

Your state senator is preparing to vote on a bill that would ban the use of vending machines in all New York State schools. Write a letter to your state senator recommending whether he/she should vote for *or* against the bill and explaining the reasons for your position.

Your Task:

Using relevant information from *both* documents, write a letter to your state senator in which you recommend whether he/she should vote for *or* against the bill banning the use of vending machines in New York State schools and explain the reasons for your position. *Write only the body of the letter.*

Guidelines:

Be sure to

- Tell your audience what they need to know about the use of vending machines in schools
- Recommend whether your state senator should vote for *or* against the bill banning the use of vending machines in New York State schools
- Explain the reasons for your position
- Use specific, accurate, and relevant information from the text *and* the chart to support your position
- Use a tone and level of language appropriate for a letter to a state senator
- Organize your ideas in a logical and coherent manner
- Indicate any words taken directly from the text by using quotation marks or referring to the author
- Follow the conventions of standard written English