Plant Adaptations to Cool Environments

【Paragraph 1】There are many interesting adaptations that allow plants to survive in cool environments One obvious strategy is dormancy (a suspension of activity) during the cold season Most of the common trees in the forests of northeastern North America, western Europe, and eastern Asia, such as the maples, oaks, beech, birches, and ashes, are deciduous trees that lose their frost-sensitive leaves during the cold winter season. In most of these trees, the leaves suffer damage at temperatures of freezing or just below. The new leaves arise in the spring from winter buds that can remain viable at colder temperatures

【Paragraph 2】Most of the needle-leaved conifers of the northern and alpine forests, such as pines, spruces, and firs, do not lose their leaves during the winter. How do such evergreen plants escape intracellular freezing (freezing within cells) and tissue destruction when temperatures may drop to -40° C or colder? In these plants, the onset of cool temperatures causes physiological changes that allow plant tissue to either avoid freezing or restrict freezing to extracellular areas (those outside of cells). For plants to avoid freezing, they must chemically alter their liquids into a form that is analogous to antifreeze in automobiles. The liquids in these plants can be cooled far below 0° C and will not freeze. This process is called supercooling and is achieved by the metabolic synthesis of sugars and other molecules which, when in solution in the plant' s tissue, lower the temperature for ice formation to far below 0° C. Supercooling seems to be the prevalent mechanism of frost resistance in herbs. For woody plants, supercooling is augmented by declines of cellular water content, greater cellular accommodation to deformation, and processes that allow water to accumulate and freeze in extracellular spaces The loss of water from the cells to extracellular areas increases the solute content (the quantity of dissolved substances) of the remaining cell water, making it more resistant to freezing. The cell walls can accommodate the deformations caused by water freezing on the exterior of the cell For northern and alpine evergreens such as pines and spruces, both supercooling and extracellular ice formation play a part in allowing the plants to withstand extremely cold temperatures One interesting facet of these physiological adaptations to freezing is that most of these plants will still be damaged by cold temperatures if they do not have a period of cooling in which to adjust to the onset of winter. This process of physiological preparation for the onset of winter cold is called frost hardening.

【Paragraph 3】Some members of the cactus family appear to resist freezing during cool nights by radiating heat stored during the day in their thick, moist tissue. The greater the mass of the cactus, the more heat it can store and the less prone it will be to freezing damage during the night. How is it then that these cacti can survive cold temperatures when they are young and small? The giant saguaro cactus is perhaps the best-known symbol of the southwestern desert of North America In the popular lore of North America, the distinctive shape of the multi-stemmed saguaro is a universally recognized icon that is used to represent deserts in movies, television, and comics Yet, this distinctive and widely recognized plant is actually found only in the Sonoran Desert of California, Arizona, and adjacent Mexico The saguaro cactus is damaged or killed if exposed to prolonged freezing temperatures Desert climates in the northern Sonoran Desert are typified by warm days but sometimes experience nighttime temperatures that are below freezing in the winter. Young saguaros that survive are found sheltered beneath more frost-tolerant desert shrubs. The cover of these shrubs acts as a thermal blanket, capturing heat radiated from the ground and keeping the microclimate of the small saguaro warm at night As the cactus grows, it eventually rises above the cover of the protective shrub The radiation of heat from the stalk of the large mature cactus prevents freezing This strategy works up to a point. The range of the saguaro is restricted to areas that do not experience more than about 12 to 24 continuous hours of air temperatures below 0° C. It appears that after 24 hours of freezing air temperatures, not enough heat reserve is left in the saguaro to keep the tissue from freezing.

1. According to paragraph 1, which of the following is true of trees like maples and oaks?

   A. They have leaves that are resistant to frost

   B. They are unable to survive if their leaves are damaged

   C. They have buds that do not produce new leaves until temperatures rise

   D. They can delay the production of buds until the arrival of spring

2. Why does the author ask the question, "How do such evergreen plants escape intracellular freezing (freezing within

cells) and tissue destruction when temperatures may drop to -40° C or colder?' in the passage?

A. To introduce an account of the ways evergreen plants protect themselves from the cold

B. To suggest that losing their leaves would allow evergreens to escape damage from the cold

C. To point out that scientists do not fully understand how evergreens survive cold temperatures

D. To emphasize that studying evergreens may hold the key to understanding how all forest plants survive cold temperatures

3. The word "onset" in the passage is closest in meaning to

A. start

B. threat

C. force

D. return

4. The author mentions 'antifreeze in automobiles' in the passage in order to

A. emphasize the difficulty trees such as conifers have in surviving

B. point out that freezing temperatures can seriously damage tree tissue

C. illustrate a chemical process in plants that prevents them from freezing

D. explain how conifers are able to raise the temperature in their tissue

5. The word "synthesis" in the passage is closest in meaning to

A. replacement

B. separation

C. change

D. combination

6. The word 'prevalent" in the passage is closest in meaning to

A. most common

B. most interesting

C. most effective

D. best known

7. According to paragraph 2, conifers avoid damage from freezing in all of the following ways EXCEPT:

A. They reduce the amount of water that is contained in their cells.

B. Their cell walls resist damage from ice forming on the outside of the cells.

C. They use the mechanism of supercooling.

D. They drop those leaves that they do not need

8. According to paragraph 3, why does the mass of a cactus influence its ability to resist freezing?

A. Larger cacti tend to have less water in them, making freezing less likely.

B. Larger cacti can store more heat in their tissues and thus stay warmer at night.

C. Cacti with more mass tend to have deeper roots that take longer to freeze

D. Cacti with more mass exchange more moisture with the air, which protects them from the cold

9. The word "prolonged" in the passage is closest in meaning to

A. unexpected

B. extreme

C. frequent

D. extended

10. Paragraph 3 supports which of the following claims about the ability of saguaro cacti to survive freezing temperatures?

A. Saguaro cacti, whether large or small, have no resistance to freezing because they seldom face freezing temperatures.

B. Saguaro cacti living in the Sonoran Desert are less likely to die from freezing than those living in other areas of the North American southwest.

C. In different ways, both young and mature saguaro cacti are protected during a freezing night by heat that had been stored during the day

D. Mature saguaro cacti can survive in areas that are too cold for the frost tolerant shrubs that shelter young saguaro cacti.

11. It can be inferred from paragraph 3 that saguaros are limited to areas in which

A. young cacti can grow taller than the shrubs surrounding them

B. temperatures remain below freezing for periods that do not exceed 24 hours

C. daytime temperatures are sufficiently high to enable cacti to store a lot of heat

D. there is enough heat radiated from the ground to protect cacti from freezing air temperatures

12. All of the following questions are answered in the passage EXCEPT:

A. How does supercooling work to prevent liquids in plants from freezing?

B. Why does the loss of water from plant cells and the collection of water in extracellular areas protect the water inside the cells from freezing?

C. How do members of the cactus family limit heat radiation during daylight hours?

D. How do frost-tolerant shrubs help protect young saguaro cacti from being damaged by extreme nighttime winter temperatures?

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

Other plants, however, possess additional defenses against freezing temperatures.

Where would the sentence best fit? Click on a square■ to add the sentence to the passage

【Paragraph 2】Most of the needle-leaved conifers of the northern and alpine forests, such as pines, spruces, and firs, do not lose their leaves during the winter. How do such evergreen plants escape intracellular freezing (freezing within cells) and tissue destruction when temperatures may drop to -40° C or colder? In these plants, the onset of cool temperatures causes physiological changes that allow plant tissue to either avoid freezing or restrict freezing to extracellular areas (those outside of cells). For plants to avoid freezing, they must chemically alter their liquids into a form that is analogous to antifreeze in automobiles. The liquids in these plants can be cooled far below 0° C and will not freeze. This process is called supercooling and is achieved by the metabolic synthesis of sugars and other molecules which, when in solution in the plant' s tissue, lower the temperature for ice formation to far below 0° C. ■ Supercooling seems to be the prevalent mechanism of frost resistance in herbs. ■ For woody plants, supercooling is augmented by declines of cellular water content, greater cellular accommodation to deformation, and processes that allow water to accumulate and freeze in extracellular spaces. ■ The loss of water from the cells to extracellular areas increases the solute content (the quantity of dissolved substances) of the remaining cell water, making it more resistant to freezing. ■ The cell walls can accommodate the deformations caused by water freezing on the exterior of the cell For northern and alpine evergreens such as pines and spruces, both supercooling and extracellular ice formation play a part in allowing the plants to withstand extremely cold temperatures One interesting facet of these physiological adaptations to freezing is that most of these plants will still be damaged by cold temperatures if they do not have a period of cooling in which to adjust to the onset of winter. This process of physiological preparation for the onset of winter cold is called frost hardening.

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Drag your answer choices to the spaces where they belong. To remove an answer choice, click on it.

Several adaptations allow plants to survive in cool environments.

Answer Choices

A. Deciduous trees survive in cold weather by shedding their leaves, but conifers have developed other physiological adaptations to protect themselves from damage by freezing temperatures.

B. Evergreens survive freezing temperatures by means of supercooling and by allowing water from the cells to collect and freeze in spaces outside the cells

and freeze in spaces outside the cells.

C. Although the saguaro cactus is one of the most widely recognized desert plants in North America, its range is actually limited to a relatively small geographical area

D. Maples, oaks, and birches are among the deciduous trees that have successfully adapted to living in areas that have cold winter weather.

E. Saguaro cacti and other plants with thick, moist tissues have developed defenses against cold temperatures that are considerably more effective than supercooling.

F. While young saguaro cacti benefit from the shelter of other plants, mature cacti use the heat they store in their tissue during the day to survive nighttime freezing temperatures

The Use of Jade and Bronze in China

【Paragraph 1】Jade and bronze were chosen early in China' s history as the materials for society' s most precious objects. The main reason for this is very straightforward Both materials are beautiful to the eye and. in the case of jade, also to the touch. Jade is a dense stone that can be ground to smooth, soft surfaces and glows in subtle greens, grays, and browns Bronze, an alloy of tin and copper, is a light, bright gold color when polished.

【Paragraph 2】Jade was employed (c. 4500 B c) for exceptionally elegant versions of utilitarian stone tools; bronze was the choice (c. 1650 B c) for the highest-quality cooking pots Made in jade, the tools were not for daily use but for displays of status and power, and the bronze cooking pots were not for ordinary meals but were reserved for offerings of food and wine to ancestors. Jade and bronze were thus used for special ritual or ceremonial versions of standard everyday items.

【Paragraph 3】The materials themselves were scarcer and required more labor to work than ordinary stone and ceramic. That this was the case must have been as clear in the past as it is today and must have marked the objects as in some way exceptional. Not only the materials but also the ways in which they were worked demonstrated their exalted functions Jade scepters (ceremonial objects of various shapes that were carried by influential people as symbols of authority) were ground more thinly than the stone tools they copied, such as axes or reaping knives. Had they been used to chop down a tree, they would have broken. Bronze cooking pots were made in intricate forms, with extra knobs and handles and dense decoration all of which would have been impracticable on everyday ceramics.

【Paragraph 4】There would be no point in using these scarce and labor-intensive materials in place of common ones if they could not be immediately recognized as outstanding. Craftsmanship was therefore directed toward exploiting and displaying the particular qualities of jade and bronze that make them recognizably different from ordinary stone and ceramic. These qualities had to be made visually noticeable Other qualities, such as weight or texture, can only be appreciated by holding the object, and fewer people will have the opportunity to pick it up and feel its features with their hands than will be able to glance at it quickly.

【Paragraph 5】Visual distinctions deployed to separate the ceremonial from the everyday can also be used to refer to smaller differences in the ranking of ritual items, separating those owned by kings from those owned by nobles. Such differences can be in size or mass—one piece being larger or thicker than another—or in skill, with one being better crafted than another. We make such judgments when looking at ancient objects today, and it seems likely that some sort of similar assessment was made at the time.

【Paragraph 6】Two hierarchies, both visible to the eye, were thus achieved. First and most fundamental was a hierarchy of function, the ritual object standing above the everyday object Second was the hierarchy within each category, with the more elaborately worked and often larger object higher up the scale. The rich and powerful owned the jade scepters and bronze vessels. What is more, these scepters and vessels not only expressed or reflected the status of their owners but they also probably reinforced it. In this way, jades and bronzes became bound up with the religious and political structures of the early Chinese state, and they remained so linked up to the twentieth century.

【Paragraph 7】It is therefore not surprising that at times when rulers and their courts wished to assert their authority, they commissioned large numbers of conspicuous bronzes. Further, when they wished to distract attention from weaknesses in society, they emphasized their power even more by increasing expenditure on ritual objects. Thus changes in the aesthetic qualities of jades and bronzes can inform us about the society that produced them.

【Paragraph 8】Later generations of Chinese scholars of the Song Dynasty (A.D. 960-1279) quickly recognized the link between the bronzes and jades and political power. In their search for political legitimacy, they collected and studied ancient artifacts, pursuits that in themselves reinforced the high status of jade and bronze in society. From the idea that political power resided in ancient objects, including calligraphy and painting, grew the first art collections.

1. Which of the following can be inferred from paragraph 1 about bronze?

   A. It is a heavier type of material than jade.

   B. It is less pleasing to the touch than jade

   C. It was preferred over jade early in China's history

   D. It was a more common material than jade.

2. According to paragraph 2, objects made from jade and bronze were

A. special versions of ordinary objects

B. passed down from ancestors through many generations

C. used for everyday purposes only by the most powerful members of society

D. more widely used than objects made from ordinary materials

3. Why does the author include the comment about jade scepters that "Had they been used to chop down a tree, they would have broken"?

A. To point out the poor quality of early Chinese tools

B. To explain why so few unbroken jade scepters have been found

C. To illustrate that jade scepters were not designed for practical purposes

D. To explain why jade tools were eventually replaced by stone tools in early China

4. The word "intricate" in the passage is closest in meaning to

A. unusual

B. elegant

C. complicated

D. carefully shaped

5. According to paragraph 3, all of the following distinguished jade and bronze objects from more ordinary items EXCEPT

A. the greater amount of work required to make objects from jade and bronze

B. the more extensive decoration of jade and bronze objects

C. the restricted availability of jade and bronze as raw materials

D. the ability of jade and bronze cooking pots to tolerate high temperatures

6. The word "exploiting" in the passage is closest in meaning to

A. paying attention to

B. discovering

C. taking advantage of

D. appreciating

7. According to paragraph 4, the qualities of jade and bronze that Chinese craftsmanship emphasized were

A. qualities that could not be immediately recognized as outstanding but required good taste to appreciate

B. qualities that could not be fully appreciated without touching an object in addition to looking at it

C. qualities such as texture or weight that could only be appreciated by handling an object

D. qualities that could be immediately recognized by just looking at an object

8. The word "assessment" in the passage is closest in meaning to

A. distinction

B. connection

C. assumption

D. evaluation

9. Paragraphs 5 and 6 support all of the following statements about jade scepters and bronze vessels EXCEPT:

A. Jade and bronze objects owned by people of higher status were generally better crafted than those owned by people of lesser status.

B. Jade and bronze objects owned by nobles were generally thicker and larger in size than the finer ones owned by kings.

C. Jade and bronze objects probably not only reflected the social status of their owners but also confirmed and strengthened it.

D. Jade and bronze objects played a role in the religious and political structures of China from early on up to the twentieth century.

10. The word "emphasized" in the passage is closest in meaning to

A. spread

B. changed

C. stressed

D. protected

11. According to paragraph 7, Chinese rulers spent more on bronze and jade objects at times when

A. there was economic prosperity

B. there were long periods of uninterrupted peace

C. the rulers needed to turn people's attention away from problems in society

D. the rulers did not need to emphasize their power and authority over their subjects

12. It can be inferred from the passage that jade and bronze objects in China were

A. owned only by people of high social status

B. difficult to distinguish from one another in value

C. produced in large numbers by scholars of the Song Dynasty

D. thought to be of lesser status than works of calligraphy and painting

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

Their prompt realization of this connection helped to strengthen their position as the new official ruling class.

Where would the sentence best fit? Click on a square ■ to add the sentence to the passage.

【Paragraph 8】■ Later generations of Chinese scholars of the Song Dynasty (A.D. 960-1279) quickly recognized the link between the bronzes and jades and political power. ■In their search for political legitimacy, they collected and studied ancient artifacts, pursuits that in themselves reinforced the high status of jade and bronze in society. ■From the idea that political power resided in ancient objects, including calligraphy and painting, grew the first art collections. ■

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The most valued objects in ancient China were made from jade and bronze.

Answer Choices

A. Although modeled after everyday tools and vessels, jade and bronze objects were designed for ceremonial and decorative purposes

B. Visually noticeable qualities made jade and bronze objects recognizably different in value from everyday objects as well as from each other.

C. As jade and bronze increased in popularity, craftsperson who worked these labor-intensive materials became powerful members of ancient Chinese society.

D. Cooking pots made from bronze were easy to distinguish from everyday ceramic pots because of obvious differences in texture and weight.

E. Because the value of jade and bronze objects was linked with social status, wealth, and power, changes in these objects' styles offer insight into the society that produced them.

F. The connection between bronze and jade objects and political power was not recognized until after the scholars of the Song Dynasty had started assembling the first art collections.

Is Perceptual Development an Innate or Socially Acquired Process?

【Paragraph 1】Most developmental scientists now agree that both nature (genetics) and nurture (environment) are essential for the normal development of perception. However, there is still much dispute about the extent to which either nature or nurture is the more important factor. Points of view on this issue are more than just philosophical musings; they affect the kinds of experiments that are undertaken. I argue here that classifying particular aspects of perceptual development as either innate or learned presents us with an overly passive view in which either genes or environment imposes structure on the developing brain. In contrast, I suggest that perceptual development is better characterized as an activity-dependent process involving complex and subtle interactions at many levels.

【Paragraph 2】To begin to illustrate my point, let's consider some recent neurobiological work on the prenatal (before-birth) development of the brain in rodents Neurons are specialized cells that transmit impulses or messages to other neurons, glands, and muscles. The neurons studied in these experiments are those involved in binocular vision. Experiments show that the prenatal tuning (training) of these neurons arises through their response to internally generated waves of electrical activity. In other words, the response properties of these visual neurons are shaped by a "virtual environment" generated by cells elsewhere in the brain and eye. Although the term "innate" can be stretched to cover this example of development, we could equally well describe this process as the cells "learning" from the input provided. Further, after birth the same neurons continue to be tuned in the same way except that now their input also reflects the structure of the world outside. When we examine development in detail, it becomes harder to argue, as some theorists do, that "innate knowledge" is fundamentally different from learning.

【Paragraph 3】Another example of the role of activity-dependent processes in perceptual development comes from the ability to detect and recognize faces Because regions of the human brain are specialized for processing faces, some researchers have argued that this ability is innate. However, experiments with infants reveal a more complex story. The tendency for newborns to look more toward faces turns out to be based on a very primitive, reflex like system that is triggered by a stimulus as simple as three high-contrast blobs in the approximate locations of the eyes and mouth. This simple bias is sufficient to ensure that newborns look much more at faces than at other objects and patterns over the first weeks of life. One consequence of this is that developing circuits on the visual recognition pathway of the brain get more input related to faces and thus are shaped by experience with this special type of visual stimulus. We can now study this process by using new brain-imaging methods. Such studies have shown that the brains of young infants show less-localized and less-specialized processing of faces than do the brains of adults. It is not until they are one year old that infants show the same patterns of brain specialization for processing faces as do adults, by which time they have had as much as a thousand hours of exposure to human faces.

【Paragraph 4】Another example comes from the study of infants' eye movements to visual targets. Although newborns are capable of some primitive reflexive eye movements, only much later in the first year can they make most of the kinds of complex and accurate eye movements seen in adults. One view is that the very limited ability present in newborns is just sufficient to allow them to practice and develop new brain circuits for the more complex integration of visual and motor information necessary for adult eye movements. Once again, it appears that infants actively contribute to their own subsequent development.

【Paragraph 5】These considerations should make us skeptical about the many claims that are made for innate perceptual abilities based on experiments with babies of four months and older. In fact, when the same experiments were done with younger infants, quite different results have often been obtained, suggesting dramatic changes in perceptual abilities over the first few weeks and months after birth.

【Paragraph 6】Infants are not passively shaped by either their genes or their environment. Rather, perceptual development is an activity-dependent process in which, during postnatal life, the infant plays an active role in generating the experience it needs for subsequent development.

1. The word "overly" in the passage is closest in meaning to

   A. unlikely

   B. automatically

   C. apparently

D. excessively

2. The word "transmit" in the passage is closest in meaning to

A. create

B. control

C. convey

D. clarify

3. According to paragraph 2, how does the tuning of visual neurons in rodents change after birth?

A. Tuning now occurs in response to internally generated electrical activity

B. Tuning now occurs in response to a "virtual environment" generated by cells in the brain and eye.

C. Tuning now becomes innate because the "virtual environment" disappears

D. Tuning now includes responses to outside stimuli.

4. What evidence does the author provide to support the claim that it is difficult to describe "innate knowledge" as fundamentally different from learning?

A. Visual neurons change in response to electrical activity from other parts of the brain or eye.

B. Visual tuning of neurons in rodents occurs after birth

C. Scientists do not fully understand how learning occurs after birth.

D. The process of developing binocular vision varies with individual rodents.

5. According to paragraph 3, why have some people argued that processing faces is innate?

A. Babies are attracted to patterns that resemble the human face

B. Babies have a primitive, reflex like reaction to faces.

C. Some parts of the brain are devoted specifically to the recognition of faces

D. Studies show that the brains of infants are less specialized than those of adults.

6. The word "triggered" in the passage is closest in meaning to

A. Explained

B. activated

C. maintained

D. illustrated

7. In paragraph 3, why does the author discuss babies' recognition of faces?

A. To contrast the development of newborns and rodents in terms of the roles of nature and nurture

B. To provide additional evidence for the argument that perceptual development is dependent upon activity

C. To provide additional support for the idea that nature influences development more than nurture

D. To describe how regions of the human brain become specialized during development

8. The word "integration" in the passage is closest in meaning to

A. Union

B. Distinction

C. Understanding

D. achievement

9. What example discussed in the passage leads to the conclusion "it appears that infants actively contribute to their own subsequent development "?

【Paragraph 4】Another example comes from the study of infants' eye movements to visual targets. Although newborns are capable of some primitive reflexive eye movements, only much later in the first year can they make most of the kinds of complex and accurate eye movements seen in adults. One view is that the very limited ability present in newborns is just sufficient to allow them to practice and develop new brain circuits for the more complex integration of visual and motor information necessary for adult eye movements. Once again, it appears that infants actively contribute to their own subsequent development.

A. Babies achieve more complex eye movements through repeated practice

B. Babies learn some eye movements by imitating the eye movements they see in adults.

C. Focusing on visual targets may make it more difficult for babies to develop adult eye movements.

D. Infants are motivated to retain some primitive reflexive eye movements.

10. What can be inferred about babies of four months and older from paragraph 5?

A. Their eye movements have become so advanced that experiments cannot measure them as precisely as before.

B. Their perceptual abilities cannot be determined because studies have not been done at this age.

C. They are visually stimulated by their environment rather than by internally generated waves of electrical activity

D. Their innate visual abilities cannot be determined because activity considerably influences perception

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

【Paragraph 5】These considerations should make us skeptical about the many claims that are made for innate perceptual abilities based on experiments with babies of four months and older. In fact, when the same experiments were done with younger infants, quite different results have often been obtained, suggesting dramatic changes in perceptual abilities over the first few weeks and months after birth.

A. Different experiments on younger children often yield similar results about perceptual ability.

B. Varying the visual stimuli in the same experiment has been shown to change the perceptual ability of younger children

C. The results of experiments on perceptual ability suggest younger infants change less dramatically than do older infants.

D. Experiments show that perceptual ability changes significantly in the weeks and months after birth.

12. The word "subsequent" in the passage is closest in meaning to

A. Later

B. Permanent

C. Basic

D. independent

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

Since the "virtual environment" shapes the neurons, binocular vision cannot be considered to be purely innate.

Where would the sentence best fit? Click on a square ■ to add the sentence to the passage.

【Paragraph 2】To begin to illustrate my point, let's consider some recent neurobiological work on the prenatal (before-birth) development of the brain in rodents. Neurons are specialized cells that transmit impulses or messages to other neurons, glands, and muscles. ■ The neurons studied in these experiments are those involved in binocular vision. ■ Experiments show that the prenatal tuning (training) of these neurons arises through their response to internally generated waves of electrical activity. ■ In other words, the response properties of these visual neurons are shaped by a "virtual environment" generated by cells elsewhere in the brain and eye. ■ Although the term "innate" can be stretched to cover this example of development, we could equally well describe this process as the cells "learning" from the input provided. Further, after birth the same neurons continue to be tuned in the same way except that now their input also reflects the structure of the world outside. When we examine development in detail, it becomes harder to argue, as some theorists do, that "innate knowledge" is fundamentally different from learning.

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Most developmental scientists still disagree about the relative importance of nature and nurture in perceptual development.

abilities.

Answer Choices

A. Recent studies support the idea that the rate of perceptual development depends upon innate abilities.

B. The tuning of neurons is most consistently effective within a "virtual environment."

C. There is evidence that human infants take active roles in the developmental process of acquiring mature and complex perceptual abilities.

D. The author believes that explaining perceptual development as either innate or learned is problematic.

E. Experiments with rodents can lead to an interpretation that neurons are "learning" even before birth

F. New brain-imaging techniques suggest that newborns share the same specialized ability for processing faces as adults do.