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# Shells Unveil Ancient Arms Race: Evolutionary Discoveries

## Description

In the past, some animals had predators that made holes in their shells. These holes ended up fossilized and tell us about the first battles between predators and prey that affected how both species changed over time.

A paleontologist from the American Museum of Natural History, Russell Bicknell, explains that this discovery shows how important predation was in the early animal world.

The shells belonged to a specific type of shellfish called *Lapworthella fasciculata* that lived during the Cambrian Explosion in what is now South Australia.

The shells showed evidence of being attacked by predators, leading to the prey evolving thicker shells for protection.

This back-and-forth between predator and prey is the earliest example of an evolutionary arms race, showing how quickly species can change when under pressure from each other.

Strong pressures like this can even lead to the creation of new species over time.

The research about these ancient battles was published in a journal called *Current Biology*.

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## Vocabulary List:

1. **Predator** /'predətər/ (noun): An animal that naturally preys on others.
2. **Prey** /preɪ/ (noun): An animal that is hunted and killed by another for food.
3. **Evolutionary** /,i:və'lu:ʃənəri/ (adjective): Relating to or denoting the gradual development of something especially from a simple to a more complex form.
4. **Fossilized** /'fɒsɪlaɪzd/ (verb): Preserved in rock; converted into a fossil.
5. **Cambrian** /'keɪmbriən/ (adjective): Relating to a period in the Paleozoic era known for the emergence of many marine species.
6. **Pressure** /'preʃər/ (noun): The continuous physical force exerted on or against an object by something in contact with it.

## Comprehension Questions



### Multiple Choice

1. What type of shellfish were the shells in the discovery attributed to?  
Option: Clams  
Option: Lobsters  
Option: Lapworthella fasciculata  
Option: Oysters
  
2. Where did Lapworthella fasciculata live during the Cambrian Explosion?  
Option: North America  
Option: Africa  
Option: South Australia  
Option: Europe
  
3. What is the name of the paleontologist mentioned in the text?  
Option: Russell Bicknell  
Option: Mary Anning  
Option: Alan Grant  
Option: Sue Hendrickson
  
4. What is described as the earliest example of an evolutionary arms race in the text?  
Option: Camouflage adaptation  
Option: Predator-prey interactions  
Option: Burrowing behavior  
Option: Migration patterns
  
5. What led the prey to evolve thicker shells for protection according to the text?  
Option: Climate change  
Option: Attack by predators  
Option: Natural disasters  
Option: Competition for food
  
6. What can strong pressures between predator and prey lead to over time according to the text?  
Option: Extinction of both species  
Option: Evolution of smaller predators  
Option: Creation of new species  
Option: Reduction in the predator population



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### True-False

- 7. The shells in the discovery were attacked by predators.
- 8. Russell Bicknell is a paleontologist from the Australian Museum of Natural History.
- 9. The text mentions that Lapworthella fasciculata lived during the Jurassic period.
- 10. The battles between predators and prey in the text are a modern phenomenon.
- 11. The shells belonged to Lapworthella fasciculata that lived during the Industrial Revolution.
- 12. The research about these ancient battles was published in a journal called Paleontology.

### Gap-Fill

- 13. According to the text, Lapworthella fasciculata lived during the \_\_\_\_\_ Explosion in South Australia.
- 14. A paleontologist named \_\_\_\_\_ explains the importance of predation in the early animal world.
- 15. The back-and-forth interactions between predator and prey resulted in an evolutionary arms race showing how species can change quickly when under \_\_\_\_\_ from each other.
- 16. Strong pressures like the evolutionary arms race can lead to the \_\_\_\_\_ of new species.
- 17. The discovery of attacked shells provides insight into the early battles between predators and prey that influenced how both species changed over \_\_\_\_\_.



18. The thickening of shells in prey species was a protective response to being attacked by

\_\_\_\_\_.

## Answer

**Multiple Choice:** 1. Lapworthella fasciculata 2. South Australia 3. Russell Bicknell 4. Predator-prey interactions 5. Attack by predators 6. Creation of new species

**True-False:** 7. True 8. False 9. False 10. False 11. False 12. False

**Gap-Fill:** 13. Cambrian 14. Russell Bicknell 15. pressure 16. creation 17. time 18. predators

## Vocabulary quizzes

**Multiple Choice ( Select the Correct answer for each question. )**

1. Which natural disasters are characterized by uncontrolled fires in wildlands?

- Option: Hurricanes
- Option: Earthquakes
- Option: Wildfires
- Option: Tornadoes

2. Which process describes the gradual development of organisms over generations?

- Option: Revolutionary
- Option: Evolutionary
- Option: Reactionary
- Option: Involuntary

3. Which mineral is essential for strong bones and teeth?

- Option: Iron
- Option: Calcium
- Option: Potassium
- Option: Magnesium

4. Which infectious bacterial disease is also known as rabbit fever or deer fly fever?

- Option: Tuberculosis
- Option: Malaria
- Option: Tularemia
- Option: Cholera



5. Which term refers to an organism that hunts and feeds on other organisms?

- Option: Parasite
- Option: Prey
- Option: Predator
- Option: Producer

6. Which sense is related to the sense of smell?

- Option: Tactile
- Option: Auditory
- Option: Olfactory
- Option: Visual

7. Which term describes the deliberate release of viruses bacteria or other germs to cause illness or death?

- Option: Bioculture
- Option: Biodefense
- Option: Biotechnology
- Option: Bioterrorism

8. Which term describes a rapid back-and-forth movement?

- Option: Rotation
- Option: Vibration
- Option: Expansion
- Option: Constriction

9. What kind of conditions result from a lack of essential nutrients in the body?

- Option: Excesses
- Option: Deficiencies
- Option: Sufficiencies
- Option: Abundances

10. What term is used to describe the sudden occurrence of a disease in a specific geographic area or population?

- Option: Epidemic
- Option: Outbreak
- Option: Pandemic
- Option: Endemic

**Gap-Fill ( Fill in the blanks with the correct word from the vocabulary list. )**

11. \_\_\_\_\_ is essential for human survival and agricultural activities.



12. \_\_\_\_\_ remains provide valuable information about ancient life forms.
13. Regular screening can help detect early signs of \_\_\_\_\_ cancer.
14. \_\_\_\_\_ are chemical signals that trigger social responses in animals.
15. Photosynthesis is the \_\_\_\_\_ by which plants convert sunlight into energy.
16. Regular exercise and a balanced diet contribute to a healthy \_\_\_\_\_.
17. Measures of \_\_\_\_\_ indicate the frequency of a disease in a defined population.
18. Biodiversity plays a crucial role in maintaining healthy \_\_\_\_\_.
19. Long-term \_\_\_\_\_ to environmental toxins can have detrimental health effects.
20. The Amazon rainforest is home to an incredible diversity of plant and animal \_\_\_\_\_.

**Matching Sentences ( Match each definition to the correct word from the vocabulary list. )**

21. The chemical of the atmosphere is crucial for supporting life on Earth.
22. Insects have tiny sensory organs called on their antennae.
23. The period saw a rapid diversification of multicellular life forms.
24. High blood can increase the risk of cardiovascular diseases.
25. Scientists conducted extensive to understand the effects of climate change.
26. The lion stalked its silently through the tall grass.
27. Dogs are often used to illegal substances at airports.
28. The flu is caused by an virus that spreads easily from person to person.
29. Ethical dilemmas often involve questions of and right and wrong.
30. A single can quickly multiply and cause an infection.



## Answer

**Multiple Choice:** 1. Wildfires 2. Evolutionary 3. Calcium 4. Tularemia 5. Predator 6. Olfactory 7. Bioterrorism  
8. Vibration 9. Deficiencies 10. Outbreak

**Gap-Fill:** 11. Freshwater 12. Fossilized 13. Colorectal 14. Pheromones 15. Process 16. Lifestyle 17. Morbidity  
18. Ecosystems 19. Exposure 20. Species

**Matching sentence:** 1. Composition 2. Sensilla 3. Cambrian 4. Pressure 5. Research 6. Prey 7. Detect  
8. Infectious 9. Morality 10. Bacterium

## CATEGORY

1. Health - LEVEL2

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