

When Evolution Runs Backwards reading passage

When Evolution Runs Backwards

1. The classification of any species as an "evolutionary throwback" is contentious. For the greater part of a century, most scientists have been hesitant to use such terms, owing to an evolutionary principle that states, "Development cannot flow reverse." However, as more cases emerge and modern genetics comes into the picture, that premise is being revised. Not only are evolutionary throwbacks feasible, but they may also play a crucial part in the evolutionary process.
2. An evolutionary holdover is referred to as an "atavism," which comes from the Latin status, which means forefather. Lombroso, a 19th-century Italian doctor who maintained that criminals were born, not produced, and could be detected by specific physical traits that harken back to a primal, subhuman existence, is chiefly responsible for the word's negative connotations.
3. While Lombroso was measuring criminals, Louis Dollo, a Belgian naturalist, was researching fossil records and arriving at the opposite conclusion. He advocated irreversible evolution in 1890, stating that "an organism is impossible to revert, even partly, to a prior stage already achieved in the ranks of its ancestors." Biologists in the early twentieth century reached a similar result, albeit they tempered it in terms of likelihood, arguing that there is no reason why evolution cannot run backward—it is simply highly rare. As a result, the concept of irreversibility in evolution became known as "Dollo's law."
4. If Dollo's law is correct, atavisms should arise only rarely, if at all. Nonetheless, deviations have emerged virtually from the idea's inception. For example, a humpback whale with almost a meter-long leglike appendages, complete with a full set of limb bones, was found off Vancouver Island in Canada in 1919, for example. At the time, explorer Roy Chapman Andrews contended that the whale had to be a relic of a land-dwelling progenitor. "I don't see any other reason."
5. Since then, so many additional examples have been uncovered that it no longer makes sense to claim that evolution is irreversible. And this raises the question of how features that vanished millions of years ago might suddenly reappear. In 1994, Rudolf Raff and his colleagues at Indiana University in the United States decided to use genetics to determine the probability of evolution regressing. In 1994, Rudolf Raff and his colleagues at Indiana University in the United States decided to use genetics to determine the probability of evolution regressing. They reasoned that, whereas some evolutionary changes entail the loss of genes and are thus irreversible, others may be the consequence of genes being turned off. They contended that if these dormant genes were somehow activated, long-lost features might resurface.
6. Raff's team then calculated the chance of it happening. They conclude that silent genes accrue random mutations, eventually rendering them worthless. So, how long can a gene persist in a species if it is no longer used? The researchers predicted that quiet genes have a strong probability of surviving for up to 6 million years in at least a few

individuals in a group and that some may survive for as long as 10 million years. In other words, throwbacks are feasible, but only in the recent evolutionary past.

7. The scientists mentioned mole salamanders from Mexico and California as a possible examples. Except for the axolotl, which notably spends its whole life as a juvenile, they begin life as a juvenile 'tadpole' and subsequently transform into the adult form. The simplest reason is that the axolotl lineage lost the capacity to metamorphose while others preserved it. A careful investigation of the salamanders' family tree, on the other hand, means that the other lineages arose from an ancestor who had lost the capacity to transform. In many other senses, the mole salamander transformation is an atavism.. The salamander example corresponds to Raff's 10 million-year time span.
8. However, cases that exceed the time limit have lately been found, suggesting that silent genes may not represent the complete picture. In a study released last year, Gunter Wagner of Yale University reported some work on the evolutionary history of a group of South American lizards named *Bachia*. Many of them have tiny limbs; some resemble snakes rather than lizards, and a few have entirely lost their hind limb toes. Other species, on the other hand, have up to four toes on their rear legs. The most straightforward interpretation is that the toed lineages never lost their toes, but Wagner disagrees. According to his examination of the *Bachia* family tree, toes re-evolved from toeless ancestors, and digit loss and gain occurred on several occasions over tens of millions of years.
9. So, what exactly is going on? One theory is that certain qualities are lost and then reemerge, comparable to how identical structures may emerge independently in unrelated species, such as shark and killer whale dorsal fins. Another fascinating theory is that the genetic information required to generate toes survived in lizards for tens or hundreds of millions of years and was reactivated. These atavistic characteristics were advantageous and propagated throughout the population, essentially reversing evolution.
10. How might long-lost features be reactivated over longer periods if quiet genes decay within 6 to 1 million years? The womb may hold the solution. Early embryos of several species exhibit ancestral characteristics. For instance, embryonic snakes develop hind limb buds. These characteristics fade later in development as a result of developmental plans that state "remove the leg." If, for whatever reason, this does not occur, the ancestral trait may persist, resulting in an atavism.

When Evolution Runs Backwards IELTS Reading Questions

Questions 1-5

Choose the correct letter, A, B, C, or D.

Write the correct letter in boxes 1-5 on your answer sheet.

1. When describing Louis Dollo's idea, the author states that

- A. Dollo's law was instantly coined to describe this phenomenon.
- B. the theory of evolutionary throwbacks was validated by this.
- C. Biologists began making changes to it in the early 1900s.
- D. It was the culmination of years of investigation.

2. We're reminded of the humpback whale that was caught off the coast of Vancouver Island due of

- A. because to its enormous size.
- B. the method in which it illustrates Dollo's rule.
- C. its impact on the local community.
- D. to explain why it is so distinct.

3. The term "silent genes" has been bandied about

- A. The number of species varies.
- B. Using the word offended Raff, thus he refused to use it.
- C. They have the potential to bring back old traits.
- D. They can live indefinitely.

4. The mole salamander is brought up by the author for the simple reason that

- A. Almost all amphibians develop in a similar manner.
- B. Raff's idea appears to be right.
- C. Several of its abilities have been lost and then re-gained.
- D. A lot of attention has been paid to its forebears over the years.

5. The following are Wagner's claims, according to him

- A. This lizard family has seen numerous members lose and acquire traits.
- B. The environment has played a role in the Bahia lizard's evolution, according to available data.
- C. According to his studies on lizards from South America, Raff is correct.
- D. Other South American lizard species will benefit from his results.

Questions 6-10

Complete each sentence with the correct ending, A-G, below.

Write the correct letter, A-G, in boxes 6-10 on your answer sheet.

- 6. For a long time, biologists disregarded
- 7. Different points of view on evolutionary throwbacks are shown by
- 8. Some examples of evolutionary classics have led to

9. As an example, the shark and the killer whale are referred to
10. One reason why Wanger's research came to these conclusions is

- A. There is a question of how long-lost qualities may be rediscovered.
- B. The presence of a specific trait in various species.
- C. Behavioral and physical characteristics are compared.
- D. preservation of some genetic information.
- E. Evolutionary throwbacks have raised a lot of questions.
- F. Evolutionary reversibility is a conceivable possibility.
- G. Lombroso's convictions and Dollo's results.

Questions 11-14

*Do the following statements agree with the claims of the writer in Reading Passage?
In boxes 11-14 on your answer sheet, write:*

- | | |
|------------------|---|
| YES | <i>if the statement agrees with the claims of the writer</i> |
| NO | <i>if the statement contradicts the claims of the writer</i> |
| NOT GIVEN | <i>if it is impossible to say what the writer thinks about this</i> |

11. Wagner was the first to conduct studies on lizards from South America.
12. According to Wagner, the Bachia lizards that have toes are descended from toeless Bachias.
13. It is extremely unusual for long-lost characteristics to reappear in embryos.
14. The womb may have a role in the emergence of evolutionary relics.