

1. **Lesson1. For Teachers:** Please have the students read the sentences one at a time and correct their pronunciation of each sentence then have them repeat after you. Wait until after they read the sentence (use the number in place of the missing word) to have the students choose the correct answer to fill in the blank. When the students finish the article, move on to the further questions.

3[B] – Feathered Dinosaurs

羽毛恐竜



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2. In 1868, British biologist Thomas Henry Huxley made a tantalizing suggestion—that there was an evolutionary link between dinosaurs and birds. Huxley believed the newly unearthed fossil of the feathered Archaeopteryx, which features both reptilian and avian characteristics, was evidence that natural selection had resulted in the evolution of birds from a dinosaur ancestor. Huxley’s theory initially received little attention from paleontologists, but he was vindicated in the mid-1960’s, when sufficient fossil evidence had been amassed to determine that birds had indeed descended from dinosaurs—specifically, from a flightless line of two-legged carnivores known as coelurosaurs. Coelurosaurs had porous, hollow bones, a uniquely shaped breastbone called a furcula, and three-toed feet—characteristics all shared by birds. Furthermore, an increasing consensus among scientists hold that most, if not all, coelurosaurs had feathers.

3. **Further Questions***Ask student to answer the question on their own at first. If the student can’t answer correctly, have him look at the last page and read the “example answer” for the question. Have the student try to memorize the answer, if it’s too long or difficult, you should divide the sentence into 2 or 3 parts to make it easier to remember. Once they have memorized the answer, the teacher should ask the question one last time so that the student can practice answering. Also if you find any mistakes, please mark the page and let me know ASAP.

4. **1) What did Henry Huxley suggest in 1868?**

5. ヘンリー・ハクスリーは 1868 年に何を提唱しましたか。

He believed that Archaeopteryx was evidence that natural selection had resulted in the evolution of birds from a dinosaur ancestor.

6. **2) What characteristics do Coelurosaurs share with birds?**

7. コエルロサウルス類と鳥とに共通する特徴とは何ですか。

8. *Coelurosaurs has porous, hollow bones, a uniquely shaped breastbone called a furcula and three-toed feet.*

Since the mid-1990s, fossils of more than 20 types of feathered dinosaurs—most of them coelurosaurs—have been discovered in a geological deposit in China’s Liaoning Province. Fossils unearthed in this deposit, called the Yixian Formation, are remarkable for their degree of preservation. Repeated volcanic eruptions buried animals in layers of fine sediment, leaving the outlines of feathers, scales, soft tissues, and even stomach contents intact. “We only

find [feather impressions] in places where conditions were just right for their bodies to be buried and preserved in a way that kept the feathers as well as the bones intact,” says Corwin Sullivan, a paleontologist and the Chinese Academy of Sciences in Beijing.

9. Further Questions

10. 3) How were the fossils in the Yixan Formation created?

11. 義県層の化石はどのように作られましたか。

12. *Repeated volcanic eruptions buried animals in layers of fine sediment, leaving outlines of feathers, scales, soft tissue and even stomach contents intact.*

13. 4) Where are fossil impressions found?

14. 化石跡はどこで見つけられましたか。

15. *They are only found in places where the conditions were just right for their bodies to be buried and preserved in a way that kept the feathers as well as the bones intact.*

16. The diminutive stature of the first feathered dinosaurs to be discovered suggested that smaller animals, which are less able than larger creatures to retain body heat, evolve feathers as insulation. Scientists speculated that all young coelurosaurs were born with a layer of feathers but that only the smallest coelurosaurs varieties sported feathers in adulthood; others shed them as they matured. This view was challenged in 2012, when a fossil of an adult *Yutyrannus huali*, a massive predatory coelurosaurs was found in the Liansong Province. According to a research team led by Xing Xu of the Paleontological Museum of Liansong, the feathers on the bus-sized animal present irrefutable evidence that “drastic reduction of the plumage was not an inevitable consequence of very large body size.”

17. Further Questions

18. 5) What did scientists speculate about young coelurosaurs?

1. 科学者達は若いコエルロサウルス類について何を推測しましたか。

2. *Scientists speculated that all young coelurosaurs were born with a layer of feathers but that only the smallest coelurosaurs varieties sported feathers in adulthood; others shed them as they matured.*

3. 6) What does the research team led by Xing Xu say about the fossil found in 2012?

Xing Xu (シン・シュウ) によって率いられる調査チームは、2012年に見つかった化石について何と断言していますか。

4. *The feathers on the bus-sized animal present irrefutable evidence that “drastic reduction of the plumage was not an inevitable consequence of very large body size.”*

5. Another surprise followed on the heels of this discovery when a 150-million-year-old fossil of a juvenile *Schiurumimus albersdoerferi*, a newly discovered species of large predator, was unearthed. The animal, which belonged to a lineage that arose before the coelurosaurs, unquestionably had long,

filament-like feathers on its ^{中央部} midsection and tail. The discovery of *Sciurumimus albersdoerferi*, the most ^{太古の} primitive meat-eating feathered dinosaur found to date, ^{肉食動物} suggests feathers may have been common to all two-legged carnivores. A new picture of such iconic species such as Tyrannosaurus rex then arises, making them appear less like giant ^{トカゲ} lizards and more like prototypical birds. Says Mark Norell of the American Museum of Natural History, “Everything we find these days shows just how deep in the family tree many characteristics of modern birds go.... At this point, it will surprise no one if feather-like structures were present in the ancestors of all dinosaurs.”

6. **7) What does the discovery of *Sciurumimus albersdoerferi* suggest about two-legged carnivorous dinosaurs?** スキウリミムス・アルベルスドエルフェリは、2本足の肉食恐竜についてどのようなことを提言していますか。

7. *It suggests feathers may have been common to all two-legged carnivores.*

8. **8) What do recent discoveries about dinosaurs show?** 恐竜についての近年の発見は、何を示していますか。

They show just how deep in the family tree many characteristics of modern birds go.

9.

10. ***Choose the correct answer from these choices.**

11. **(35) Fossils in the Yixian Formation** 義県層の化石は

1 offered evidence that Lianing Province was once home to dinosaurs that could not have survived in other areas of China.

12. **2** are present in greater numbers than scientists would expect considering the destruction caused by repeated volcanic ^爆 ^発 eruptions in the area.

13. **3** display a number of characteristics that demonstrate the extent to which geological conditions affected the evolution of prehistoric life forms.

14. **4** were formed under unusual circumstances that allowed for more-detailed preservation of feathers than normally seen in fossils.

15. **(36) The discovery of a *Yutyrannus huali* fossil in 2012 revealed that**

2012年のユティラヌス・フアリの発見は、次のことを明らかにしました

16. **1** the presence of feathers was not restricted to juvenile and smaller coelurosaurs, but was also possible on large adult coelurosaurs.

17. **2** while coelurosaurs did not grow feathers until they had reached maturity, other varieties of dinosaur were likely born with them.

18. **3** the function of feathers on larger dinosaurs' bodies was related to their need to regulate their body temperature as they grew into adulthood.

19. **4** dinosaurs evolved feathers earlier than researchers had first realized, but they were not necessarily present on the largest carnivorous ^{捕食動物} predators.

20. **(37) What is implication of Mark Norell's comment?** マーク・ノレルの発言は、どのようなことを示唆していますか？

21. 1 In the past, scientists failed to recognize feathers in dinosaur fossils because they had not considered the similarities between dinosaurs and modern birds.
22. 2 Researchers can expect to uncover further evidence that dinosaurs were the descendants of animals with a significant resemblance to birds.
23. 3 Similarities between *Tyrannosaurus rex* and *Yutyranus huali* proved that birdlike features developed independently in separate species.
24. 4 The discovery of *Sciurumimus albersdoerferi* does little to support claims to the earliest ancestors of dinosaurs had feathers.

Answers for "Further Questions"



25. 1) What did Henry Huxley suggest in 1868?
 2. *He believed that Archaeopteryx was evidence that natural selection had resulted in the evolution of birds from a dinosaur ancestor.*
3. 2) What characteristics do Coelurosaurs share with birds?
 4. *Coelurosaurs has porous, hollow bones, a uniquely shaped breastbone called a furcula and three-toed feet.*
5. 3) How were the fossils in the Yixan Formation created?
 6. *Repeated volcanic eruptions buried animals in layers of fine sediment, leaving outlines of feathers, scales, soft tissue and even stomach contents intact.*
7. 4) Where are fossil impressions found?
 26. *They are only found in places where the conditions were just right for their bodies to be buried and preserved in a way that kept the feathers as well as the bones intact.*
- 5) What did scientists speculate about young coelurosaurs?
 27. *Scientists speculated that all young coelurosaurs were born with a layer of feathers but that only the smallest coelurosaurs varieties sported feathers in adulthood; others shed them as they matured.*
28. 6) What does the research team led by Xing Xu say about the fossil found in 2012?
 29. *The feathers on the bus-sized animal present irrefutable evidence that "drastic reduction of the plumage was not an inevitable consequence of very large body size.*
30. 7) What does the discovery of *Sciurumimus albersdoerferi* suggest about two-legged carnivorous dinosaurs?
 31. *It suggests feathers may have been common to all two-legged carnivores.*
32. 8) What do recent discoveries about dinosaurs show?
 33. *They show just how deep in the family tree many characteristics of modern birds go.*

解答: (35) 4 (36) 1 (37) 2