

**Questions 19-27 are based on the following passages.**

Passage 1 is adapted from Brian Switek, "Triassic Crocodile Cousin Walked Like a Dinosaur." ©2011 by American Association for the Advancement of Science. Passage 2 is adapted from a book by the same author, *My Beloved Brontosaurus*. ©2013 by Brian Switek.

**Passage 1**

At a glance, it would be tempting to call *Poposaurus gracilis* a dinosaur. This 225-million-year-old reptile stood on two legs, had small forelimbs, and sported a long, tapering tail that  
5 allowed it to balance while walking and running about the Late Triassic landscape. But *Poposaurus* wasn't a dinosaur at all. It was much more closely related to the forerunners of crocodiles, and, according to a new study, its curious mode of  
10 walking challenges a leading hypothesis about why dinosaurs were so successful.

First described over a century ago, *Poposaurus* is a "rauisuchian," part of an extinct lineage of reptiles whose diverse array of members included  
15 the precursors of crocodiles and their closest relatives. Rauisuchians differed from crocodiles as we know them today in holding their limbs upright beneath their bodies rather than out to the side. This arrangement made them more efficient at  
20 walking and running on land, and, until recently, all rauisuchians were thought to have walked on all fours.

Then, in 2006, paleontologists Sterling Nesbitt and Mark Norell of the American Museum of  
25 Natural History in New York City described a bipedal rauisuchian they called *Effigia okeeffeae*. The discovery showed that at least some of the rauisuchians adapted a very dinosaurlike posture. Now, a new skeleton of *Poposaurus* described by  
30 Nesbitt, Yale University paleontologist Jacques Gauthier, and co-authors in the current edition of the *Bulletin of the Peabody Museum of Natural History* confirms that it, too, walked like a  
35 dinosaur. Instead of being an evolutionary fluke, the new find suggests that *Effigia* was part of a specialized subgroup of bipedal crocodile cousins that diversified at the same time as the early dinosaurs.

According to the new research, the anatomy of  
40 the creature's pelvis and hind limbs shows that *Poposaurus* walked upright, planting its feet close to the midline of its body. In fact, the hip anatomy

would have made it impossible for *Poposaurus* to sprawl its limbs out to the side, like living crocodiles,  
45 although the exact way the rauisuchian's feet touched the ground is unclear. *Poposaurus* may have stood on tiptoe, walked with the whole foot touching the ground, or it might have alternated between both foot postures depending on how fast it was moving.

**Passage 2**

50 The true identity of *Effigia* was given away by the archosaur's ankle. Dinosaur ankles are dominated by a large, triangle-shaped bone—the astragalus—and have a very small accessory ankle bone called the calcaneum. Their ankles look like a simple hinge. But  
55 crocodile-like archosaurs have a large ankle bone that locks together into a complex unit where the connection between the ankle and foot has an S-shaped divide. This is the kind of ankle *Effigia* had.

The articulation with the hip was also key. In  
60 dinosaurs, the head of the femur juts inward to a hole in the pelvis. But the femur in *Effigia* articulated with the pelvis in a different way, in a fashion similar to croc-line archosaurs rather than to dinosaurs. The evidence was clear. Though *Effigia* was undoubtedly  
65 a crocodile cousin, the animal walked with an upright, bipedal posture like the early dinosaurs it lived alongside. Standing on two legs, this toothless archosaur had a long neck, tiny arms, and a body counterbalanced by a long tail. The deadly and  
70 über-efficient skeletal design of dinosaurs was not unique, after all.

*Effigia* wasn't an evolutionary fluke. The creature was quite similar to another animal from roughly the same time period, named *Shuvosaurus*. And while  
75 both *Effigia* and *Shuvosaurus* were toothless bipeds, a lovely skeleton of their close relative *Poposaurus* shows that there were sharp-toothed varieties, too. And all three were offshoots of a line of frightening creatures called rauisuchians.

80 So the upright posture of dinosaurs wasn't a unique invention that made them an unstoppable force. "This has always been a funny argument to me," said paleontologist Sterling Nesbitt. Not only is it "nearly impossible" to recognize evolutionary  
85 competition among prehistoric lineages, "*Effigia* and *Poposaurus* show that dinosaurs were not the only game in town, at least when talking about stance." Posture alone wasn't the deciding factor. Why

dinosaurs ultimately succeeded, and why *Effigia* and kin didn't leave descendants, might have come down to the fact that dinosaurs "had a unique combination of characters" that somehow gave them an evolutionary advantage.

19

The main purpose of Passage 1 is to

- A) defend a controversial theory.
- B) argue for the validity of a previously dismissed hypothesis.
- C) explain the effects of a course of action.
- D) present a groundbreaking discovery and its implications.

20

Passage 1 states that before the discovery of *Effigia*, paleontologists believed that rauisuchians

- A) had no relationship to today's crocodiles.
- B) always used four legs to walk.
- C) were not efficient runners on land.
- D) held their arms and legs out to the side.

21

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 7-11 ("It . . . successful")
- B) Lines 12-16 ("First . . . relatives")
- C) Lines 16-18 ("Rauisuchians . . . side")
- D) Lines 19-22 ("This . . . fours")

22

As used in line 69, "counterbalanced" most nearly means

- A) annulled.
- B) canceled.
- C) neutralized.
- D) offset.

23

As used in line 78, "offshoots" most nearly means

- A) roots.
- B) prototypes.
- C) branches.
- D) sources.

24

Passage 2 states that *Effigia* was unlike *Poposaurus* in that *Effigia*

- A) walked upright.
- B) had no teeth.
- C) was part of the rauisuchian line.
- D) had hinge-like ankles.

25

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 64-67 (“Though . . . alongside”)
- B) Lines 74-77 (“And while . . . too”)
- C) Lines 78-79 (“And all . . . rauisuchians”)
- D) Lines 85-87 (“*Effigia* . . . stance”)

26

Which claim is made in both passages?

- A) Paleontologists have studied *Poposaurus* for more than one hundred years.
- B) Rausuchians lived in the Late Triassic period, 225 million years ago.
- C) Dinosaur ankles feature a large bone called the astragalus.
- D) Some rausuchians walked like dinosaurs.

27

Compared to Passage 1, Passage 2 offers much more information about dinosaur

- A) anatomy.
- B) posture.
- C) evolution.
- D) movement.