

3.4 Fossils and Dragons

In this dialogue, Rocky and Plato talk about books, dragons, fossils, probability, and science.

Rocky: I am reading this way cool book. It is so exciting; I can hardly put it down.

Plato: I am finishing up a book too. A good one but not what I would call exciting. What is yours about?

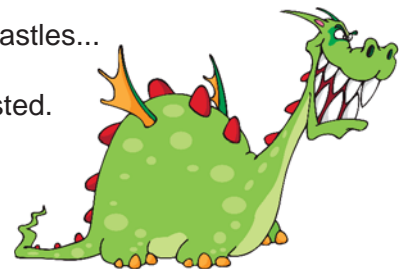
Rocky: It is set in medieval times with knights and castles and battles. But the absolute best part is the dragons. They are amazing!

Plato: Ah, so it is fiction.

Rocky: Why do you say that? There were really knights and castles...

Plato: *(interrupting)* ...but no dragons. They never really existed.

Rocky: Why do you say that? *(a bit peevisly)* I know that there are none now but there might have been some before. They could be extinct.



Plato: Fair enough. I will grant that there is an itsy-bitsy chance that in the distant past there was something like a dragon. But the odds are against it.

Rocky: Why do you say that? There were all kinds of things that lived a long time ago but are now gone. I have seen fossils in the museum. And how about mammoths and mastodons? *(smugly)* Got you there, don't I? They lived during the ice ages and are now gone.

Plato: All true. But all of the examples that you are giving me are things that we have evidence for. Huge mammoths and mastodons, and dinosaurs, and ancient whales: these are all things we know about because we have found evidence for them. We have no evidence for dragons.

Rocky: Maybe we just haven't found them yet. The first dinosaur bones weren't found and named until the early 1800s. That isn't *that* long ago.

Plato: But we have references to "giant" bones as far back as 2,000 years in some Chinese writings. It might be from these bones that myths of dragons and giants arose. The point is that people have been finding these large bones for a long time. They just didn't have a good explanation for them way back when.

Rocky: But people keep discovering new kinds of fossils. Heck, they even find new living things all the time. If we don't even know about everything that is living now, how could we know about everything that *ever* lived? I just heard about these tube worms that live in the deep, deep regions of the ocean near hydrothermal vents.

Plato: Good points. You're right. We don't know every species that has ever lived. And I am sure that we will keep discovering more. But think about your example: I think they are called tube worms. Where did you say they live?

Rocky: In the deep, deep ocean. Why does that matter?

Plato: That is a place that, up until recently, we have not been able to explore. It makes sense that many of the new species would be found in places that people simply have never been before. Many of the new species we keep finding are also quite small. I think the chances of finding a new species that is the size of an elephant is pretty slim, especially if it lives on land.

Rocky: Hmm. That might be true for living species, but everything is different when it comes to fossils. Even things that lived on land, right out in the open, may now be in rocks that are deeply buried.

Plato: You make a good point. We will never know for sure that we have found all of the remains of all of the species that ever lived because we will never be able to look at every rock.

Rocky: And some of the rocks have already been recycled through the processes of plate tectonics so that evidence is gone for good.

Plato: But dragons would have had backbones and according to stories, would have been able to fly. That means that they can't be in the oldest rocks. We would expect to see them no earlier than the time of the dinosaurs.

Rocky: Maybe they were a kind of dinosaur.

Plato: That makes sense. At least the stories might have been based on dinosaur bones.

Rocky: Weren't there dinosaurs that flew? I saw some in that Jurassic Park movie...one of them anyway.

Plato: You must be thinking of the pterosaurs. They are not really dinosaurs but they are a group of flying lizards. The one with the coolest name is *Quetzalcoatlus*. It's fun to say. Some of the pterosaurs had a wing span of nearly 70 feet!

Rocky: That sounds pretty dragon-y to me.

Plato: The problem is that all the evidence indicates that dinosaurs and the flying reptiles went extinct about 65 million years ago. That was a long time before any people, particularly the knights and kings of Merry Old England, came along.

Rocky: But some of them *could* have survived and *could* have been what people called dragons.

Plato: Science deals in probabilities. So technically you are correct. Since we can't look at every rock and find every piece of evidence there is a possibility that what you say actually happened. But the chance is so small it's practically impossible. Sort of like there is a chance...it is possible...that an airplane could fly over us right now and drop bags of thousand dollar bills at our feet. It *could* happen right?

Rocky: I get your point. So in a way we are both right. There *could* have been dragons, but probably not. I guess that that small probability is enough to make for fun stories.

Plato: It sure is. And could I borrow that book when you are done with it?

Author - Amy Schiebel