

[BIRDS CHIRPING]

JOY: It's such a beautiful day out.

SIDDHARTH: Yeah, so peaceful and quiet.

[RUMBLING]

Oops, I spoke too soon. What's all that noise?

JOY: It kind of sounds like it's coming from my backyard. Let's check it out.

EDWARD I turned the corner. You weren't even--

DRINKER COPE:

OTHNIEL I never made a mistake in my entire life.

CHARLES

MARSH:

JOY: Wow, it looks like a wrestling match.

SIDDHARTH: Oh, Joy, do you know these two guys?

JOY: Oh, let me see. No, my usual wrestling crew all have different mustaches. Besides my WrestleMania extravaganza isn't until next week.

SIDDHARTH: Yeah, why are they in fancy suits? Seems kind of old timey.

EDWARD Give it back you, nitwit.

DRINKER COPE:

OTHNIEL I found it first. And finders keepers.

CHARLES

MARSH:

SIDDHARTH: It looks like they're playing tug of war with a stick, maybe. I can't tell.

JOY: I should probably say something, huh?

SIDDHARTH: Definitely, they're getting pretty feisty.

JOY: You're so right. OK, all right. All right. Break it up. What's all this hullabaloo about?

[HEAVY BREATHING]

OTHNIEL What now?

CHARLES

MARSH:

EDWARD Huh?

DRINKER COPE:

JOY: Hi, my name is Joy. And this is my pal, Siddharth.

SIDDHARTH: Hey.

JOY: And this is my backyard. If you're here for WrestleMania, that's next week, buddy.

EDWARD Sorry, but we're kind of in the middle of something here.

DRINKER COPE:

OTHNIEL Yeah, I dug up this dinosaur bone and Mr. Sticky Fingers over here took it.

CHARLES

MARSH:

SIDDHARTH: Hold up. Have you two been digging around in Joy's yard?

EDWARD Oh, well, it's really more of an excavation.

DRINKER COPE:

OTHNIEL Yes, think of it as a scientific exercise, see.

CHARLES

MARSH:

JOY: Not cool, random mustached men. And that's not a dinosaur bone. It's my dog's bone he likes to chew on. He buried it in the yard last week.

[DOG BARKING]

EDWARD Well, he started it.

DRINKER COPE:

OTHNIEL Did not.

CHARLES

MARSH:

EDWARD You thought a dog bone was a dinosaur bone. Ha.

DRINKER COPE:

OTHNIEL You thought the exact same thing, you hypocrite. Besides how can you expect me to see anything when you're kicking up dust all over the yard.

CHARLES

MARSH:

JOY: Oh, my goodness. Can both of you be quiet? And since you've already dug a hole in my yard, could you please repot this tomato plant?

EDWARD Yes, old chap. It's really the least you could do.

DRINKER COPE:

OTHNIEL You have got to be kidding me. You definitely dug most of the hole. I mean, I walked back there I knew exactly what I was looking for--

CHARLES

MARSH: [MUSIC PLAYING]

JOY: Welcome to *Forever Ago* from APM Studios. I'm Joy Dolo.

SIDDHARTH: And I'm Siddharth. And today, we're talking about the Bone Wars.

JOY: A raging rivalry over discovering dinosaur bones and other fossils.

SIDDHARTH: Why do I have a sneaking suspicion that those guys in your yard have something to do with this.

JOY: You're probably right. But I have to give it to them. They do a great job with the tomato plant.

SIDDHARTH: It's true. And at least it quietly enjoying those popsicles we gave them.

[SLURPING]

OTHNIEL Cherry.

CHARLES

MARSH:

JOY: You know, I'm a firm believer that popsicles can solve most problems. But I'm getting distracted here. Back to the Bone Wars.

[MUSIC PLAYING]

Our story begins in the mid 1800s in America. And to say there's a ton going on, well, that'd be an understatement. For starters, thousands of settlers are moving West. Families loaded their stuff into covered wagons basically big horse drawn carriages with a piece of cloth stretched over the top.

SIDDHARTH: Then they traveled hundreds, sometimes thousands, of miles. The promise of gold and good fortune brought people to mine in California. Others moved West to start their own farms.

JOY: As settlers pushed westward, they claimed more and more land. Often displacing and removing Indigenous people who had lived there for generations.

SIDDHARTH: By this time, the US was adding a new state every couple of years. And as the country grew, it became more divided on what should and shouldn't be allowed in these new states.

JOY: Like slavery, in the 1850s, it was still legal to own enslaved people in some US states. The South wanted to keep it that way while the North wanted to get rid of it. This tension eventually led to the Civil War.

SIDDHARTH: Meanwhile, technology started growing fast.

[TRAIN ENGINES]

JOY: The railway was really starting to take off across the country. And there's a new science starting to emerge called paleontology.

SIDDHARTH: That's the study of prehistoric life that existed before humans, like plants fish, insects, mammals and, my favorite, dinosaurs.

JOY: And paleontologists can study this ancient life thanks to fossils. Fossils are created when remains of a living thing are preserved in rock or sediment. It could be a shell, or a tooth, or a bone.

SIDDHARTH: Or just the impression of something like the outline of a leaf or a footprint.

JOY: And these fossils are very, very old. We're talking millions of years. But back in the 1800s, the science of studying them was still pretty new. But let's get this straight. People have found dinosaurs long before this. Before we even knew what they were.

SIDDHARTH: Some people thought these bones belong to a mythical creatures. In ancient China, some believed they had found dragon bones.

JOY: Others, in ancient Greece and Rome, thought they found the remains of human giants, or even griffins-- a legendary creature that was half lion half eagle.

RILEY BLACK: So we know, for example, in the Western United States many Indigenous peoples, they already knew what fossils were.

JOY: That's science writer Riley Black. She specializes in all things paleontology, fossils, and dinosaurs.

RILEY BLACK: They knew that these were the remains of animals that were once here and are here no longer and develop their own understanding of what these animals were well before Western scientists started to take a fascination with these things.

JOY: And this fascination really started ramping up in the 1800s. More and more paleontologists were digging up fossils. The American government started to fund more science research. Scientists, like Charles Darwin, were starting to think more about evolution, how species change and adapt to their environments.

SIDDHARTH: It was a very new and radical idea at the time.

JOY: Right, and you know what was another new and radical idea? The fact that these giant lizards used to roam the Earth a.k.a. dinosaurs which brings us to--

[TRUMPETS]

--The Bone Wars.

RILEY BLACK: The Bone Wars principally came out of these two paleontologists, Othniel Charles Marsh and Edward Drinker Cope.

JOY: Those are quite the names.

SIDDHARTH: I've heard these guys between the two of them they discovered more than 130 dinosaurs.

JOY: That's pretty cool.

SIDDHARTH: Yeah, they also got really competitive. Like so competitive, they destroyed each other's fossils.

JOY: Wait, what? They sabotaged each other.

EDWARD Well, actually there's a lot more to the story.

DRINKER COPE:

OTHNIEL Let me tell it, it's my turn.

CHARLES

MARSH:

SIDDHARTH: Uh-oh, I knew it. It's those guys again. The ones who are wrestling over a dog bone in your backyard.

JOY: Not these two again. I thought we distracted them with popsicles.

OTHNIEL Allow me to introduce myself. I'm off Othniel Charles Marsh. Pleasure.

CHARLES

MARSH:

EDWARD And the name is Cope, Edward Drinker Cope.

DRINKER COPE:

JOY: Wait, so you're the infamous paleontologist we were just talking about.

EDWARD Indeed. I'd like to think of myself as a child science prodigy turned paleontologist extraordinaire.

DRINKER COPE:

OTHNIEL Humble, aren't you? I wrote my first scientific article at age 19 and made my way in the field all by myself.

CHARLES

MARSH:

EDWARD Ahem, with the help of his rich parents. Ahem.

DRINKER COPE:

OTHNIEL Excuse me.

CHARLES

MARSH:

EDWARD Isn't your Uncle George Peabody? One of America's wealthiest men.

DRINKER COPE:

OTHNIEL Whatever. Cope, more like nope, am I right?

CHARLES

MARSH:

JOY: OK, OK, you two, settle down.

SIDDHARTH: Yeah, I think it's time we bring in the talking bone.

JOY: Great idea. Do y'all know about the talking bone?

OTHNIEL No, is this some sort of new specimen? A Talkosaurus Rex, perhaps.

CHARLES

MARSH:

EDWARD Or a Talkoraptor.

DRINKER COPE:

OTHNIEL Well, that just sounds like a taco dinosaur. It doesn't make any sense.

CHARLES

MARSH:

EDWARD Tacos are delicious, and you know it.

DRINKER COPE:

OTHNIEL Oh, believe me, I know. I love tacos.

CHARLES

MARSH:

EDWARD Not as much as me. They're my favorite food.

DRINKER COPE:

OTHNIEL Well, I love tacos the most.

CHARLES

MARSH:

EDWARD I love tacos the mostest.

DRINKER COPE:

OTHNIEL Well, one time I ate 24 tacos in one sitting. So there.

CHARLES

MARSH:

JOY: Zip it. See this bone here.

OTHNIEL Is that the dog bone from earlier?

CHARLES

MARSH:

JOY: Correct. The rules are simple. You can only talk if you have the talking bone. Now, you do not have the talking bone. I have the talking bone. So I'm the one talking, see. Now I'm passing it to Siddharth.

SIDDHARTH: Now, I'm the one who's talking. Just raise your hand if you need to talk and we'll pass the bone. Here you go, Joy.

JOY: Thanks, Siddharth. OK, Cope, Marsh, things weren't always like this right.

EDWARD I suppose.

DRINKER COPE:

JOY: Ahem, ahem, would you like the talking bone, Cope?

EDWARD Oh, yes.

DRINKER COPE:

JOY: Here you go.

EDWARD As I was saying, Marsh and I met back in 1863 when we were students in Germany.

DRINKER COPE:

OTHNIEL Yeah, one might say we were even fri-- frie-- friends.

CHARLES

MARSH:

EDWARD You didn't have the talking bone.

DRINKER COPE:

OTHNIEL Give it here. One might say we were even friends, there.

CHARLES

MARSH:

EDWARD Anyway, we even named fossils after each other. I named one *Colosteus marshii* in honor of Marsh.

DRINKER COPE:

OTHNIEL And I returned the favor with *Mosasaurus copeanus*.

CHARLES

MARSH:

JOY: How sweet? Oops, I don't have the talking bone.

SIDDHARTH: They seem to be talking like adults. So let's just roll with it.

JOY: Good plan. OK, so you're both really into finding fossils and dinosaurs. You're naming things after each other. Where did it all go wrong?

EDWARD Two words, New Jersey.

DRINKER COPE:

[MUSIC PLAYING]

You see once we returned from our studies abroad, I invited marsh to come visit a stone quarry. You know, a mine where people dig up rocks for building materials and other stuff. And you can also find all sorts of fossils there.

So we were walking around and I thought we were just chilling out. Maxing, one might say, relaxing all cool. But Marsh was up to no good.

SIDDHARTH: Uh-oh.

EDWARD Major uh-oh. Marsh went behind my back and paid the quarry owner to send new fossils back to him at Yale

DRINKER COPE: University.

JOY: Not cool, Marsh.

EDWARD So uncool.

DRINKER COPE:

OTHNIEL OK, but better in my hands than his. One time, Cope put the head of a dinosaur on its butt instead of its neck.

CHARLES Who does that?

MARSH:

JOY: Whoa, whoa, whoa, what's this story?

SIDDHARTH: Wait, wait, wait, back up.

OTHNIEL Oh, you're going to love this. So Copesey over here had just reassemble this fossil of a marine reptile.

CHARLES

MARSH:

EDWARD I called it the Elasmosaurus.

DRINKER COPE:

OTHNIEL Right, right, right, right, whatever. Get this. He put the skull on the tail instead of its neck. [LAUGHTER] Cope

CHARLES didn't even realize until someone else pointed it out to him.

MARSH:

EDWARD A common mistake. I mean, have you seen the stuff that comes out of the ocean? I mean, what in tarnation, how

DRINKER COPE: was I supposed to know?

OTHNIEL [LAUGHTER] This is too good, too good.

CHARLES

MARSH:

SIDDHARTH: So this is the beginning of the end.

EDWARD Pretty much.

DRINKER COPE:

OTHNIEL Exactly.

CHARLES

MARSH:

JOY: It's worth noting this behavior was extreme but not necessarily out of the ordinary. Scientists have been feuding for centuries. Take scientists Isaac Newton and Gottfried Wilhelm Leibniz. The pair argued over who first invented calculus.

SIDDHARTH: And don't forget Thomas Edison and Nikola Tesla. They beefed over whose electric system would powered the world.

[ELECTRIC STATIC]

JOY: Scientists don't always make a lot of money. So sometimes, they're after long lasting legacies, maybe even a bit of fame. I mean, who isn't? I mean, come on, *Forever Ago*, that's my gig, right. A little bit of fame. Anyhow, that can still be the case today. But for the most part, science is way more collaborative now.

SIDDHARTH: Right, to make progress scientists have to work together sometimes in the different communities or countries. It takes a lot of folks working together to do research and make new advances.

JOY: But way back then, it was less about teamwork and more about making a name for yourself which made things competitive.

OTHNIEL Oh, you don't even know the half of it.

CHARLES

MARSH:

EDWARD Actually, I do know the other half of it because I am the other half of this story.

DRINKER COPE:

JOY: Oh, dear. I think it's time for an emergency popsicle break.

EDWARD I'll have grape flavor.

DRINKER COPE:

OTHNIEL Nah, I'll have another cherry.

CHARLES

MARSH:

JOY: Oh, here you go.

EDWARD Mm-hmm.

DRINKER COPE:

OTHNIEL So good. So delicious. I love you popsicle.

CHARLES

MARSH:

JOY: OK, Siddharth, while we have a minutes peace, let's play--

ANNOUNCER: *First Things First.*

[MUSIC PLAYING]

JOY: It's the game where we try to put things in order from oldest to newest. Today we're focusing on extinctions. Siddharth, how would you explain what an extinction is?

SIDDHARTH: So an extinction is when a species of plant or of animals dies off from the face of the Earth. So mass extinction would be like the time when the dinosaurs died out. It would be when hundreds, maybe millions, of species of both plants and animals died out almost all at once.

JOY: Wow, yeah, you know a lot about extinction. That's exactly what it is. Basically, when an entire species dies out. So which extinction do you think happen first, the dodo bird, the woolly mammoth, or the sabertooth tiger?

SIDDHARTH: So I know the dodo bird is the newest extinction because it went extinct in like a couple hundred years ago in the 1600s.

JOY: Uh-huh.

SIDDHARTH: No, 1400s, I don't know. I think mammoths and sabertooth tigers died out-- well, I think they both died out quite recently. But I think sabertooth tigers died out first because I know mammoths died out about 10,000 years ago.

JOY: Oh, wow.

SIDDHARTH: And I think sabertooth tigers went extinct maybe 15,000.

JOY: Oh, my, that's so accurate. Like I have no idea. Like that's really interesting. So we think the dodo bird is first, the oldest. And then we have the sabertooth tiger which was--

SIDDHARTH: No, no, dodo bird is last.

JOY: Oh, dodo-- OK, so it's sabertooth tiger.

SIDDHARTH: First, then mammoth.

JOY: woolly mammoth, and then the dodo bird.

SIDDHARTH: Yeah.

JOY: Oh, that's great. You know, I actually think I remember hearing about the dodo bird dying out like not recently but like as like the most recent thing. And I feel like woolly mammoth and sabertooth tiger, all I could think of is like Ice Age. So I'm like they must be like the oldest things.

SIDDHARTH: Yeah.

JOY: But I think you have a little bit more scientific knowledge than I do. [LAUGHTER] But we'll see. We'll see what happens when we come back.

[MUSIC PLAYING]

If you have ideas for *First Things First*, or topics you'd like us to cover on the show, please send them to us. Go to foreverago.org/contact. History is everywhere. What do you want to explore? Tell us. Again that's foreverago.org/contact. Keep listening.

[MUSIC PLAYING]

INTERVIEWER 1: It's *Didja Know* where we serve up bit-sized tidbits of history. No bite too tiny. No bit too teensy. History is everywhere you look.

LUKA: My is Luka. I'm from Omaha. My question is, how cartoons are invented?

INTERVIEWER 1: With cartoons, drawings came to life. Did you know people have been making cartoons for more than a hundred years? Back then, it took 900 separate drawings to make 1 minute of animation.

INTERVIEWER 2: This new art form is going to change the world. You just take one drawing. And then you draw it again, and again, and again, and again, and again, and again, and again, oh, my hand.

INTERVIEWER 1: Walt Disney released the first ever feature length animated movie in 1937, *Snow White and the Seven Dwarfs*. It took 750 artists to make and a lot of drawings. Can you imagine working for years spending hours drawing Sneezzy's nose over, and over, and over again.

INTERVIEWER 2: Got to get those nostrils just right. One more line. And-- [SNEEZE] dang it. Got to start over.

INTERVIEWER 1: Makes me tired just thinking about it. I'm going to need to take a break and watch my favorite cartoon just to calm down. Hey, who took my popcorn?

[MUSIC PLAYING]

JOY: You're listening to *Forever Ago* where we explore the before. I'm Joy.

SIDDHARTH: And I'm Siddharth.

JOY: And it's time to find out which thing came first in history. Drumroll, please.

SIDDHARTH: [DRUMROLL]

JOY: OK, so let's see. Oh, my-- Siddharth, guess what?

SIDDHARTH: Did I get it right?

JOY: You got it right.

SIDDHARTH: Yes.

JOY: You got it right. Yes, you're absolutely right. But I knew it in my bones. Haha, get it? I knew you got it right. So first thing, sabertooth tigers, they went extinct about 8,000 years ago. The scientific name for sabertooth tigers is, listen, [GIGGLES] smilodon fa--

SIDDHARTH: Smilodon.

JOY: Smilodon fatalis--

SIDDHARTH: So-- Oh--

JOY: Fatalis.

SIDDHARTH: I know this. Yes, smilodon, I think there are two species, smilodon fatalis and smilodon populator.

JOY: Oh, my goodness.

SIDDHARTH: And-- and there's another species of sabertooth cat called thylacosmilus.

JOY: Oh, Wow, the scientific name for the sabertooth tiger is smilodon fatalis which translates to deadly knife tooth, pretty metal. They had two large upper canine teeth, each up to 8 inches long. Perfect for snagging prey.

And then, like you said, second was woolly mammoths. So that went extinct about 4,000 years ago.

SIDDHARTH: Wow, they stuck around way longer than I thought.

JOY: Yeah, me too. woolly mammoths were like big furry elephants that roamed Earth during the Ice Age. Most woolly mammoths died out 10,000 years ago but a small population were stranded on Wrangel Island just off the Russian coast.

SIDDHARTH: So I was right about most of it.

JOY: Yeah.

SIDDHARTH: About 10,000 years ago.

JOY: Yeah, yeah, about 10,000. Your numbers were pretty close. The Wrangel Island mammoths survived until about 1650 BC. For context, that's more than 1,000 years after the pyramids of Giza were built in Egypt.

SIDDHARTH: Wow.

JOY: Yeah, woolly mammoths were probably the same size as African elephants, around 13 feet tall. Woolly mammoth also had not one but two layers of fur to help keep them warm. The outer layer was up to 20 inches long. That's why they can walk around in the snow, like in that movie *Ice Age*, where they're all in the snow, which was a real thing based on real events.

SIDDHARTH: But the weird thing is that like 10,000 years ago, when mammoths and sabertooth tigers lived, there actually wasn't snow. The snow was very recent.

JOY: Really.

SIDDHARTH: Yeah.

JOY: So what do you think they needed all that wool for?

SIDDHARTH: I think they evolved. Because I think it was like a different species, like Colombian mammoths.

JOY: Oh. Well, you're right about the mammoths. And last, you're also right about the dodo birds, extinct in the late 1680s. Some researchers say, as late as 1690. So you were right. You're very close. The dodo was a type of bird that once lived on Mauritius, an island off the coast of Madagascar. Dodos were distant relatives of pigeons and other doves. The last confirmed sighting was in 1662 by a Dutch settler.

SIDDHARTH: An extra fun fact, the dodos closest living relative is the Nicobar Pigeon which lives on the Nicobar and Andaman island off the coast of India.

JOY: Really. And actually, close to the dodo bird actually is Dolo. The Dolos live in Minnesota.

SIDDHARTH: Nice.

JOY: We're not extinct yet. We're still out there.

SIDDHARTH: You're still kicking.

JOY: I'm still kicking. Dodos were considered a mythical creature from their extinction until the 19th century. The idea of extinction was new. So since scientists couldn't find any physical evidence, they figured the bird was made up. Siddharth, I've got to say you've got to start your own YouTube series or something where you just tell us all the facts about dinosaurs. You're just-- you're kicking it.

SIDDHARTH: Yeah, since you're talking about dodo bird, my favorite prehistoric bird is called Titanis.

JOY: Titanis, what's that? What does that look like? What is-- what kind of bird is that?

SIDDHARTH: It's about 11, 12 foot tall giant bird with a huge, gigantic hooked beak. It can snap a horse's thigh bone. It has like gigantic talons on its feet, which it can use to kick and slash. And it's estimated to run like 40 miles per hour, and just for extra terrifying facts, they were thought to hunt in packs.

JOY: Oh, so they did it all together. Oh, no, like wolves. I mean, I have to Google all of this later. Like he gave me a whole homework session right there. But let's continue forward. And let's see what's happening with these Bone Wars.

[MUSIC PLAYING]

Before the break things were really starting to heat up between paleontologist Edward Cope and Othniel Marsh.

SIDDHARTH: The two friends had quickly turned into enemies.

JOY: One might say frenemies.

OTHNIEL CHARLES MARSH: I would say that we are strictly enemies.

MARSH:

EDWARD DRINKER COPE: At least we can agree on that.

DRINKER COPE:

JOY: And they each wanted to be the very best paleontologist.

SIDDHARTH: And to these two that meant finding and naming as many fossils as possible.

OTHNIEL CHARLES MARSH: Well, yes, but most importantly, I wanted to name more than Cope.

CHARLES MARSH:

MARSH:

EDWARD DRINKER COPE: You could never.

DRINKER COPE:

OTHNIEL CHARLES MARSH: Try me.

CHARLES MARSH:

MARSH:

EDWARD DRINKER COPE: Elasmosaurus.

DRINKER COPE:

OTHNIEL Ceratops.

CHARLES

MARSH:

EDWARD Diclonius.

DRINKER COPE:

OTHNIEL Apatosaurus.

CHARLES

MARSH:

EDWARD Camarasaurus.

DRINKER COPE:

OTHNIEL Brontosaurus.

CHARLES

MARSH:

EDWARD Why, brontosaurus is just a apatosaurus by a different name. That doesn't count

DRINKER COPE:

OTHNIEL Oh, come on, man.

CHARLES

MARSH:

JOY: Whoa, OK, that's a whole other story for another time.

SIDDHARTH: If you want to learn more, Brains On did a whole episode about the brontosaurus also co-hosted by me.

JOY: You can check it out in brainson.org.

SIDDHARTH: But back to the Bone Wars.

JOY: Cope and Marsh were trying so hard to outdo each other, things got nasty.

OTHNIEL You see, this sneaky sneak Cope over here starting to send spies over to observe my digs.

CHARLES

MARSH:

EDWARD Allegedly, and I'm pretty sure you were spying on me too.

DRINKER COPE:

OTHNIEL I got so paranoid. I started asking my workers to destroy fossils so Cope couldn't get his greedy mitts on them.

CHARLES

MARSH:

SIDDHARTH: Now, that's petty.

JOY: And that's just the tip of the iceberg. The two were racing to name species as fast as they could. Naming things left and right with little care or attention. Here's Riley Black, again.

RILEY BLACK: It was to the point that sometimes they'd have their field assistants literally telegraph in descriptions that would have typos in them or get the names wrong.

JOY: Remember, this is way before the internet. The telephone had just been invented and not many people had one. If you wanted to send a message from far away, you had to use a telegraph. This machine that sent electrical signals through long cables and wires. The signals were translated into letters and words and so on. Obviously, it wasn't as simple as sending an email or making a phone call. So those messages got real sloppy real quick.

[TELEGRAPH]

MAN: Mm-hmm. Says here they discovered a supercalifragosaurus.

WOMAN: Well, the latest one says it's actually called souposaurus.

WOMAN: This one just says, soup.

[SLURPING]

WOMAN: Should we send soup?

RILEY BLACK: And then there'd have to be a debate at the scientific society about, OK, well you telegraph this in, and you're saying it's one name but then you're presenting another name here, and you published a third name, so which is it?

JOY: This back and forth also played out in the media. Cope and Marsh were constantly dissing each other's scientific papers. At one point Cope even bought a scientific journal so he could publish his own papers.

EDWARD Not to brag, but it's a pretty solid plan. I mean, I thought they would just publish whatever I wanted.

DRINKER COPE:

SIDDHARTH: You just bought an entire magazine.

EDWARD Oh, yes, easy-peasy. Remember, I come from big bucks money.

DRINKER COPE:

[CHING]

JOY: And that's the thing. Cope and Marsh were two wealthy guys who had a ton of resources and connections at their fingertips. So they just went after each other no matter how ridiculous or destructive they were. They had the money to do it.

SIDDHARTH: This had to come to an end, right? Please tell me it ends.

JOY: Don't worry, it does. As things progressed, fellow scientists were starting to get annoyed. And some institutions started noticing. Remember that journal Cope had bought, well, the editors got so fed up, they refused to publish anything by him or Marsh.

[KNOCKING]

WOMAN: Sir, they're back again. They want their articles published. What should I tell them this time?

EDITOR: Blast, just tell them I'm braiding my horse's mane. No, no, no, no, I'm at a mustard eating contest. You know what, let's just crouch behind our desks until they leave.

JOY: Not long after Marsh started working for the government as one of the top paleontologists at the US Geological Survey. And this job meant Marsh had a lot of power.

OTHNIEL CHARLES MARSH: Oh, yeah, I got to decide who got money for their research, and different projects, and even fossil digs.

JOY: And Marsh tried to use that power to cut off Cope from government funding. That way he couldn't get any more fossils.

EDWARD DRINKER COPE: He even tried to take my entire collection. He was ruthless. So I fought back. I found a journalist and told him all the wrongdoings of Marsh.

JOY: And in 1890, *The New York Herald* published the article.

WOMAN: Hot off the press, read all about it. Scientists waged bitter warfare.

SIDDHARTH: And that's when everything blew up. Marsh and Cope went after each other in the newspaper for two whole weeks. Riley said, this is a big turning point in the Bone Wars.

RILEY BLACK: And this was like the public expose of Cope and Marsh and just how nasty they were to each other, how nasty they were to their colleagues. Basically, the people that Cope and Marsh trained or employed to send them fossils were now making a name for themselves are going like we are just so tired of these guys.

MAN: Would you too to just give it up?

WOMAN: Please, we're begging you.

RILEY BLACK: It was an embarrassment to the science. And paleontology wanted to move away from this image of the lone naturalist trying to be on top of everybody else.

JOY: Cope and Marsh had burned so many bridges and burned through all their money. In the end, Marsh lost his job at the Geological Survey and had to give up his collection of fossils. And Cope had nothing but his fossils left but nobody would buy them.

SIDDHARTH: OK, so you mean to tell me that Cope and Marsh went behind each other's backs, they made mistakes with names, and they embarrassed fellow scientists. Yes, they discovered lots of fossils but they also destroyed so many just so the other one couldn't claim it. All to be the best, most well-known paleontologist. Oh, I have to ask, did anything good come out of the Bone Wars?

RILEY BLACK: The Bone Wars in a scientific sense really established paleontology as a science in the United States. And it branched out into other parts of the world. And that a lot of the people that Cope and Marsh initially hired to do fossil collecting for them or trained became the next generation.

JOY: It's quite the tale. But if you think about it, it's really reflective of the times. The settlers who headed West were in a frenzy to claim land in gold even at the expense of other people, namely the Indigenous people who had been there for thousands of years before. The Bone Wars are no different.

SIDDHARTH: Cope and Marsh are just as hungry to go and claim bones and no matter the cost of the land, the people around them, or even their own reputations.

JOY: Right, it's worth noting that both Cope and Marsh relied a lot on Indigenous guides to help them locate fossils. These guys didn't get the same credit or acclaim as Cope and Marsh. And for many of these tribes, these bones were sacred. And that was simply disregarded by the paleontologists.

SIDDHARTH: Just like the settlers pushing West, it goes to show that science and culture are not separate.

JOY: It's quite the opposite. They're so closely intertwined and reflective of one another. Now, science is trying to evolve with the times. It's striving to be more collaborative and also more compassionate.

SIDDHARTH: That means respecting the perspectives of different folks in their culture, especially Indigenous people and their communities.

JOY: There's still a lot of room for improvement.

SIDDHARTH: Yeah, it's a work in progress.

JOY: Totally.

OTHNIEL Psst, over here.
CHARLES
MARSH:

JOY: Yes.

OTHNIEL May I have the talking bone, please?
CHARLES
MARSH:

JOY: Oh, of course, here you go.

OTHNIEL Thank you. Is there any way we can get another popsicle, please?
CHARLES
MARSH:

EDWARD Everything just tastes so much better on a stick.
DRINKER COPE:

JOY: Oh, no, I'd give you more but that was my last box. What on Earth will you do now?

SIDDHARTH: We should make something with all these popsicle sticks.

EDWARD Like a trophy?
DRINKER COPE:

SIDDHARTH: What about a dinosaur?

OTHNIEL I like the sound of that, Siddharth.

CHARLES

MARSH:

EDWARD Let's make a stickosaurus. Like a Stegosaurus but sticks.

DRINKER COPE:

OTHNIEL That's a silly name. It should be a popsicle--

CHARLES

MARSH:

EDWARD The audacity.

DRINKER COPE:

OTHNIEL I was talking here. You see the bone.

CHARLES

MARSH:

SIDDHARTH: Oh, brother.

JOY: OK, listen up. This is how you have a civil conversation with one another. You don't have to agree but you have to at least listen to one another.

SIDDHARTH: Yeah, just take turns speaking. No talking over each other.

JOY: And no dissing. Marsh, if you have another suggestion, say it politely.

OTHNIEL OK. Cope, stickosaurus is a good effort. But I was thinking popsadactyl.

CHARLES

MARSH:

EDWARD Like popsicle and pterodactyl, I see. OK, I hate to admit it, but I actually like that name better.

DRINKER COPE:

OTHNIEL Yeah, duh. I mean, thank you for listening. How about you take the head and I'll work over here on the legs?

CHARLES

MARSH:

EDWARD You'd let me make the head.

DRINKER COPE:

OTHNIEL Yes, let's do it.

CHARLES

MARSH:

SIDDHARTH: Yeah, I can make the wings.

JOY: And I will make the decorative top hat. This is going to be one fashionable popsadactyl.

ALL: Teamwork makes the dream work.

[LAUGHTER]

[MUSIC PLAYING]

[SPRAY CAN]

JOY: I'm glad Cope and Marsh finally left but I wish they didn't leave so many popsicle finger smudges all over my windows.

SIDDHARTH: Yeah, and they did a terrible job filling in the hole they dug up. But hey, we learned a lot talking to them.

JOY: Right, it turns out people have been discovering dinosaur bones long before they knew what they were. But the science of paleontology didn't really take off until the 1800s.

SIDDHARTH: So that's when Othniel Charles Marsh and Edward Drinker Cope went from friends to feuding and started what we now call the Bone Wars.

JOY: They wanted to name as many fossils as possible and they named a lot. But eventually, they ran out of money and embarrassed fellow scientists. It's a lesson that too much competition can be a bad thing.

SIDDHARTH: And too many popsicles. They took the last two with them. Now, what are we going to eat.

JOY: Maybe my dog will share that bone they dug up.

[DOG BARKS]

[MUSIC PLAYING]

[LISTING HONOR ROLL]

SIDDHARTH: Have a history question for us, send it to us at foreverago.org/contact. We might answer it in an upcoming *Didja Know* segment.

JOY: We'll be back next week with a super cool episode about how guitars learn to rock. See you next time and thanks for listening.

[MUSIC PLAYING]