

Ryan: But I mean, a turtle one could be good to breathe through the tongue. They also breathe through their asses. That's about the only joke I have to say. So I don't know.

Charlie: Are you, what, do they really?

Ryan: Well, now the joke is blown because Charlie now knows.

Charlie: I could still, I'll say that exactly the same way.

Music

Announcer: Hello, and welcome to Science sort of.

Ryan: Hello, welcome to science sort of Episode 39. With your host, the Paleo Pals. I'm Ryan joining me as always, are my cohorts in critical crimes, Patrick.

Patrick: Hey, they're Paleo Posse.

Ryan: And Charlie.

Charlie: Hey, Ryan. Hey, Patrick, hey Paleo Posse.

Ryan: You almost said Paleo POW.

Charlie: I know.

Patrick: It's hard not to.

Ryan: Yeah, our acronyms are subtle, subtly different.

Patrick: Yeah.

Ryan: This week's theme critical drinking And before we go into what you're probably used to hearing which, you know what I haven't done in a while, I just realized, I keep forgetting to say, the show, you know, welcome to Science on this

show with conversations that are all about science, things that are sort of science and things that wish they were science.

Charlie: It is a show about all three of those things.

Ryan: I think I've forgotten to say it for a couple of weeks now, I'm sorry. It's important Paleo Posse. If you're confused as to what this show is gonna be about before we actually got into it. Now you know.

Charlie: It's a good reminder to me as well.

Ryan: Yeah. And they're conversations, so don't expect us to be succinct. But before we get into what you're probably all waiting for, is the what are we drinking? We're actually going to bring in our interviewee because we think, we'll have some, we think what he'll have something to contribute as well. And that would be Brian Dunning of the Skeptoid Podcast. We're gonna bring him in right now.

Brian: Hello.

Ryan: Hi, Brian.

Brian: Hey, what's up?

Ryan: Hey, not much. This is Ryan.

Brian: Hello.

Ryan: And my co hosts are Patrick.

Patrick: Hi, Brian.

Brian: Hello.

Ryan: And Charlie.

Charlie: Hey, how's it going?

Brian: What's up?

Ryan: And we waited for you to announce our, our beverages this evening. So would you like to start us off? Or do you want to hear what we're having before we dive in?

Brian: Oh, I'll hear what you're having first. So that way I'll know whether I need to exaggerate.

Ryan: Okay, Charlie why don't you kick us off.

Charlie: I got something special tonight, I'm having a Hop Rod Rye from the Bear Republic brewery in Healdsburg, California.

Ryan: That's a good one. immense.

Charlie: You've had it before?

Ryan: I have.

Charlie: Yeah, so it's 18% rye. And it's got so much hops in it that there's sediment on the bottom. But I'm a little worried because it's 8% percent alcohol, so I'm gonna have to sip it kind of slow.

Ryan: Nice. That maybe a lot for you but... Patrick, what about you? What are you having?

Patrick: I'm at the opposite end of the spectrum in so many ways. It's very unimaginative, very unhoppy, very low alcohol content. It's the, it's the Guinness.

Ryan: Yeah, yep, that's your standby.

Charlie: It's good.

Ryan: It is good. There isn't anything wrong with it.

Charlie: And good for you.

Ryan: Yeah, yeah, well, Patrick, you may be on the other side of the spectrum but I'm on the other side of the world. Because I got a, an epic Armageddon IPA from New Zealand.

Patrick: And?

Ryan: And, ah, it's good. It's only 6.66% alcohol, which is on the low end for the beers I tend to get, but it's ah, yeah, it's a nice refreshing IPA from a long way away.

Charlie: Is there any other kind of Armageddon besides the epic sort?

Ryan: Ah, is it possible to have a boring Armageddon? I guess so. Die with a whimper instead of a bang? Well, Brian, what are you what are you enjoying this evening?

Brian: Yeah, well, I guess it might be as cliché as the Guinness. I'm not so much of a beer guy. I'm more of a more of a whiskey guy. Tonight, I'm, tonight I'm doing my all time favorite Laphroaig.

Charlie: Oh, that's an excellent whiskey.

Brian: I love it. I was starting to do the whole single malt thing and I came across this and I just decided I'm done with my search I'm doing, I'm staying right here.

Ryan: Hmm, so how do you how do you take your whiskey? Neat, on the rocks?

Brian: Oh just neat. Yeah, I stopped doing the you know, adding a tiny little bit of water thing. I kind of didn't buy that I had been told that it's like letting your wine breathe. You know, you need to get the oxygen in there or whatever, adding water to your whiskey had some strange some similar effect, but I don't buy it.

Patrick: Have you done that episode yet?

Brian: It's on the list.

Ryan: Have you heard about those cooling rocks that they have that are little stones that you keep in your freezer and so they don't add moisture to the whiskey? They just keep it cool.

Brian: Yeah, although I take it room temperature.

Ryan: All right.

Brian: As is intended.

Ryan: Yeah, we did a story, one of our favorite stories, or at least my favorite stories, was awhile ago, on the, the Shackleton Whiskey trapped in the frozen antiquities of Antarctica.

5:03

Brian: Yeah, wow.

Patrick: Pretty cool.

Brian: I'd like to see someone try and get a hold of a bottle of that stuff and open it up.

Ryan: That's their, that's their, there's an expedition being planned.

Brian: Are they actually gonna try and open a bottle and drink it?

Ryan: They're gonna try and bring some back. They can only, they can only bring back so much because I have to leave some there as like a historical antiquity, but it's um, it's in the glass bottles already so it wouldn't have aged at all since it was stuck there. And the place that made the whiskey is...

Charlie: Yeah, the distillery...

Ryan: ...is still distilling, the master blender wanted to try some and see if he could recreate the recipe.

Brian Oh, interesting.

Ryan: Yeah. But the captain of the expedition said he wouldn't try any because he wanted to just keep it in his imagination where it would be better.

Brian: Or he was afraid of how horrible it was...t

Ryan: Some serious rot gut. Well Patrick mentioned that you might have done a show on the whiskey but we should probably tell those who aren't familiar that Brian Dunning is the host of the podcast, Skeptoid, which is one of the most popular and prolific skeptical podcasts out there. Episode 208 just came out yesterday. So you've been doing this for a while. And do you want to give people a brief rundown of what Skeptoid is and what it's about?

Brian: Sure it's a short, one subject show. Each episode, they run about 12 minutes long on average. So it's a easily digestible, bite sized chunk. And each week I take a look at something in popular culture, whether it's an urban legend, a conspiracy theory, even, even some consumer frauds, things that people generally believe, that's not true. And and there's no shortage of subjects. You say I've done 208 I've done most things that everyone could think of but I haven't even done the Loch Ness Monster yet so there's, there's still plenty of ground yet to be covered.

Ryan: What, what inspires you to do any particular episode is it just whatever hits you that week or what?

Brian: Yeah, I only had to think of the first five episodes myself. Ever since then people send me stuff way faster than I'll ever be able to keep up with. So I, I, just in fact cleaned out my folder of ideas that people have sent me and I've got about 220 in there still so far. So that'll keep me going another four years, even if I don't, even if nobody else sends me any. And yeah, each week I just open up that folder and just kind of scroll through them and see what tickles my fancy and occasionally I'll even come up with something myself. For example, this this week's episode that just came out yesterday was on a UFO event that happened in Australia that most people in the United States probably haven't heard of. You know, we've got a few popular UFO stories here that everyone knows you know, Roswell, etc. But this is one that happened in Australia and the only reason I knew about it is because a guy

there who was a radio host, he emailed me and said, hey, you ought to do an episode of this because the Australian sci-fi channel is just about to bring out a documentary on it. And I had an opportunity to scoop them. Which I did...

Ryan: Oh cool.

Brian: I think the documentary comes out in a couple of days. And, and I'm giving an alternative viewpoint. So my hope is that right now my episode is winding its way throughout Australia, priming the audience to, to recognize the BS that they're about to be fed in this in this ridiculous "documentary".

Ryan: And I'm not sure if this is something you've experienced, but it seems like podcasts are huge in Australia.

Brian: Yeah, I have, I definitely have a disproportionately large percentage of my listeners come from Australia, which is great. I, it's, it's a country I've never visited. I've always wanted to and I get, I get to go later this year. They're having the first The Amazing Meeting in Australia. And, is it, November?

Ryan: Yes.

Brian: And and I'm going to be a speaker at that. So I get to go and have my first visit to Australia and from from the percentages it seems like about every third person in the country listens to my show. So, really looking forward to that.

Ryan: Or they, they all just have eight or nine computers and they're just downloading everyone.

Brian: That could be or they're all just extraordinarily intelligent.

Ryan: I have a lot of friends who tell me that you know they're behind on the show and that they, but you know, I'm like oh, that's fine, are you still downloading it like, as long as you download it that's, that's all I really need.

Brian: I just need the numbers.

Ryan: Yeah, listening is is inconsequential compared to the numbers. And yeah, you have, some you have some very impressive numbers and it seems like a lot, that comes with the popularity or a lot of people that don't agree with you or appreciate what you're doing. And every couple of episodes you do a listener feedback special where most of them are pretty vitriolic and ah...

Brian: Yeah, yeah the the listener feedback episodes are you know, it's more fun of course to play the, play emails from people who disagree with me.

Patrick: Sure.

Brian: It's your, you know, no need to just have a giant masturbation, by, you know, a love letter to myself.

10:00

So instead I, and I don't get these through an email. People who hate me, they usually don't email me. That's, that's too too much of a personal confrontation, I guess. They usually just post anonymously to the website.

Ryan: Hmm.

Patrick: I thought you were gonna actually get snail mail from people so irritated they needed handwriting into paste, you know, to cut out letters...

Ryan: Yeah.

Brian: I'm expecting my first one of those anytime now. Yeah, so the listener feedback episodes are really fun. Actually, they're, something of a departure from what I usually do, because I'm actually trying to reach people with my show. I'm actually trying to reach the people who do disagree with me. And so I don't come off as, I don't insult them. I'm not snarky. I try to present my show in a way that's going to be appealing to the people that I most need to reach. And then I come out with these listener feedback episodes. Which is just the polar opposite where I'm just directly basically making fun of people. So, it is a little bit of a schizophrenic point that I need to figure out how I'm going to handle that. But listeners love those episodes. A lot of people say that they're their favorite episodes. Just watching me

bag on these people who make these incredibly fallacious arguments. And it's, it's a lot of fun and it's great practice for honing your critical thinking skills for trying to dissect these emails that you receive and look at them, go through them and find what the logical fallacies are and find why their arguments are bad. It's great practice for me.

Charlie: Well, absolutely. I read that your name, Skeptoid, actually came from anonymous internet vitriol. Do you want to go into that story, a little bit for the for our listeners?

Brian: Yeah. Yeah. Now this was before I knew what podcasts were. Like, like most people who listen to these science shows, I had a lifelong fascination with, you know, weird stuff. You know, Bigfoot, spaceships, all the paranormal stuff and everything. Not that I believed in it, but I was just fascinated by it and I was always reading everything. And so I'm going through the internet and I signed up on a number of these paranormal forums, or I, phenomena forums and, and this one time in particular I can remember they were talking about rods. And rods for those who don't know, are, what actually happens is an insect flies past, in front of a camera, with the light sources behind the photographer and there's a dark background, the insect is kind of brightly lit up. And as the insect flies through, let's say a 30th of a second as the camera lenses open, he may beat his wings several times during that 30th of a second, you end up on the film with a picture of this, what looks like a long stripe, a rod shaped animal with sort of a long undulating wing down its side. Now that's of course just just an artifact of what the insect was doing as it moved and beat its wings. But there is a subculture of people who firmly believe that this is some sort of an animal that is invisible to the naked eye and shows, only shows up on film. And they have all sorts of theories about you know why this is and everything, it's, it's just ridiculous. And you, you cannot explain to them, even though this is so simple to understand, you cannot explain to them, they refuse to accept the explanation. Their minds are absolutely closed to any explanation except the one they're dead set on. So I'm looking in this this internet forum where they're talking about this and I didn't realize that they were serious and I've said is it possible that there are people who actually believe this stuff? I mean, the, the explanation is so well known. And, and the two replies that I remember were "warning skeptoid alert". And the next person said, "Another evil debunk-a-Tron raises its ugly head". So, when I started my, and then I was immediately banned from the forum. So when I started my podcast some months later I remembered this and I named the podcast the Evil skeptic debunk-a-Tron.

And that was actually the title of the first five episodes of Skeptoid until people said, hey, you know, people are actually listening to the show, we like it, but you're looking quite foolish with that silly title, so you better change it. And of course, by then, I already had the domain name, skeptoid.com and the RSS feed and everything. So I just shortened it to just skeptoid and went back and re recorded those episodes and put my real name in there and everything. Yeah, that was, that was a one of my first introductions to really, the sort of head to head confrontation that...

Patrick: So, so it seems like you enjoyed pretty quick podcast success from the from the beginning. Is that right?

15:00

Brian: Well, I think, I think okay. When, when I started, it was 2006 and there were a lot fewer podcasts. And so it was kind of easier to be more visible. I mean, almost automatically you're on one of the front pages in, in iTunes in the category section. And of course, that's, that's the thing that really catapults your numbers. When I first went from being somewhere in iTunes, onto the front page of the science category in iTunes. That took me overnight from 13,000 listeners to 40,000 listeners. And since then, it's just it's grown, just a very steady line up to about 100,000 now. Although it kind of oscillates between about 90,000 and a 110,000. And the way I measure the stats is I measure the number of unique IP addresses that download one or more episodes within a seven day period. I do all my own reporting and everything on the website. I have a web development background myself and so I do all the, all my own programming. So I have total control over, you know, figuring out exactly what my stats really are. Because every, every hosting service, they have their own way of measuring popularity, they say, well, should we just count total downloads? Or should we just count unique IP addresses? There's all kinds of different ways that you can, that you can measure listeners. And there's a, I could go on and on about this, I'm not sure if you want me to.

Ryan: We're, we're all working scientists, we love stats, it's part of the job.

Brian: Well, you've got problems like proxy servers, where one, like, for example, a neighborhood that shares a cable modem will be one download, and the proxy server then distributes that out to anyone else who requests it. And so you've got

an artificially low number. And then you've got AOL, where you may have an artificially high number, because of the way the funny ways that they distribute IP addresses. So it's, it's kind of a black art and there's a lot of things that you just can't tell when you're trying to count your, your subscribers, but I do the best I can.

Ryan: Well, let's just, I think, I think that's good to know. Because now we can just say, well, we have this many listeners, but that's artificially low probably.

Brian: Yeah.

Ryan: We hope. Well, let's see, I don't want to bore people too much with inside podcast. So we should talk more about I guess the, the science so. So, you said, you have a background in web development. But your show covers like you said a huge number of topics. So where is your information coming from that it's so distinct and that your, your outlook is so unique compared to the people that just believe whatever the popularized version is?

Brian: Well, yeah, although my background, I say, and I have a background with web development, that's, you know, what I do as a practical matter day to day. But my by actual training and background is in computer science, which is not something that really applies very well to supporting a family. So, and I, actually, in college I double majored in college in film directing. So I always had an interest in entertainment, writing, especially writing and, and, and science. And it, I never really found anything that, that let me combine those into the type of thing that I enjoyed doing until podcasts came out. And that's what, that's when, that was my moment in my career when you know, kind of the clouds open and the angels all (singing) Ohhhhhhhh. This is like, exactly, what I enjoy doing. So I get to, I mean, it's the greatest job in the world. I get to spend hours upon hours upon hours each week researching weird stuff on the internet. You know, being paid to web surf.

Charlie: Right.

Patrick: It does sound pretty good.

Brian: Except there's not, the being paid part is not such a very large part of it. But it's, it's I have kind of The PBS model on my show. I ask for donations and, and somewhat, something less than 1% of my listeners support the show in some, in

some capacity and it offsets most of the costs. So it costs me less than it costs most people to sit and web surf is a more accurate way of saying it.

Ryan: There you go.

Charlie: Nice. So I wondered how you felt about your most popular, popular list on the, on your website. So they have a few very, you have a few very interesting titles. For instance, the number one most popular podcast, Skeptoid podcast is how to argue with a creationist.

Brian: Yeah.

Charlie: Another one that caught my eye the detoxification myth. I was wondering if you, those are the podcasts you're most proud of, or the ones that you want to be disseminated the most or if you have mixed feelings about the different ones that are up there.

Brian: I like all of those except that number one, "How to argue with a creationist" and it's really how to argue with a young earth creationist is what it should have been titled.

20:01

That one is the most popular and it's the most popular by a huge margin. It's a, it has about a third, again, as many downloads as number two on the list. And I suspect that's just because it's ruffled the feathers of so many young earthers that it's been downloaded a lot. And it's really a fairly weak episode. It was one of my earlier ones, and I was not really very good at what I was doing yet. The arguments that I chose to respond to are not very strong arguments, and I didn't give very strong responses to them. Nevertheless, it's been one of the most popular so you know, I stand behind it, whatever.

Patrick: You must have been doing something right, I guess.

Brian: Yeah, I guess so. The detoxification one, that's the number seventh most popular episode. That one is, that's a case of definitely being popular because it's controversial. When you talk about these kind of, these new age Alternative

Medicine things like a detoxification, that's something that's so politically correct and you're, you're Satan incarnate if you are not into alternative medicine. It's, I don't, I'm not sure why that is why it's considered politically incorrect to, to favor science based medicine, things that actually work. But, but that's, that's how it is in the United States now. The detoxification myth episode focused on basically products that are sold to detoxify you. Now that's a word it has almost no meaning to, to doctors or to the medical profession. And none of these products have any remote plausibility to them. One of them is a pill that you take that contains basically kitty litter and, and a polymerizing substance.

Ryan: It's gross.

Brian: Yeah. You take this pill, it dissolves in your bowels and it is essentially makes a rubber cast of your bowels, which you then pass to, for lack of a more ugly word. And so you've got all these pictures on the Internet of these people holding up this big, horrible looking dark brown rubber snake, lifting it up out of the toilet that came out of their body. And this pill is sold as saying, hey, this thing will cause your body to purge these horrible toxic substances that build up inside everyone's bowels. And in fact, it's not true. In fact, this pill simply creates this this thing inside your bowels. So that's a perfect...

Charlie: Oh man.

Brian: ...example of how this whole detoxification fad is just it's an outright fraud. I have not heard that these are particularly dangerous, but certainly there's no medical benefit to doing that. A couple of years ago, I had to have a, what do you call it when they stick the camera up there for close up...

Charlie: Colonoscopy.

Brian: Thank you. I had, I had to have one of those and you need to be completely cleaned out in order to do that. All you need to do is stop eating for 48 hours and drinking water and ah, and that's all it takes. Your bowels are crystal clear. He sends the camera up there and there's nothing. You don't have stuff building up inside, it's just simply false.

Ryan: But that's not what people want to hear. People, people want to feel like there's something, something sinister inside them that they can expunge and be okay.

Brian: They want to believe, they, people want to believe that you have the power to control your own body. They want to believe that you've got the power, the ability to control your own health, and that there is something that's a simple, easy, quick solution. And something that's all natural. They love to hear that as well.

Ryan: Yeah.

Brian: And, and if you can throw in the fact that doctors are all just a conspiracy of evil trying to keep you sick, that's, that's another concept that that people are just really receptive to.

Ryan: But how big is your check from Big Pharma?

Brian: That's, that's, that's an old joke. But so many of my comments, in fact, I'm gonna go through and do a search of all the comments on the site for every time someone mentions payroll, Big Pharma, big oil, big, big corn. I'm accused of being on the payroll of all of these things.

Ryan: You're the ultimate lobbyist.

Patrick: You're not the first person we joked with this about and who then had to say, yeah, that's funny, but really, I'm not.

Ryan: It was Steven Novella, the guy we had on who he joked about being a shill for Big Pharma.

Brian: Yeah, I'm sure he gets it at least as much as I do. But it's so funny, despite it's such an old joke now, I will still, almost every day, someone will post a comment saying some of these guys have been found to be on the payroll of Big Pharma. It's so silly.

25:00

If you look at, on these 208 episodes now, 209, 208 and they're on incredibly diverse subjects. I mean, just looking at the last five it was this UFO in Australia. It was dinosaurs surviving in remote parts of the world. Morgellons disease, listener feedback episode, a great episode about Josef Mengele. Did he continue his medical experiments in South America after the war? So these incredibly diverse subjects, I'll do one on high fructose corn syrup, and then people will say, this guy has been being paid by big corn to do all these other episodes for four years, just so we could sneak in this one little thing that basically amounts to a blog entry on the internet.

Charlie: So insidious.

Ryan: I don't think they're getting their money's worth, Brian.

Brian: Oh, it was worth millions to them. I'm sure just to get that one little blog entry out there. So much sense.

Ryan: That's funny. Um, well, one thing I've noticed about, about your show because I listened to a couple other skeptical shows Skeptics Guide to the Universe being the most prominent, and then our show, I listened to just by virtue of editing it. And I noticed that shows...

Brian: That's not much of a sales pitch for your own show. I listen to it because I have to edit it.

Ryan: But I listen to it with love.

Charlie: I listen to it and I don't have to edit it.

Brian: Okay, good.

Ryan: Um, but one of the things I noticed is that we tend to, you know, we, our show is very conversational. We try to keep things loose, we tried to just chat with each other about stuff, which means that occasionally we're wrong. And we have, you know, sometimes another one of us will call somebody out on being wrong because we know they're wrong. And it's, you know, it makes for good banter and it's funny to see the guy who's wrong, get get called out. And I've heard similar things like

that happen on SGU. But you're by yourself and your show, it seems like you extensively research things beforehand. So, you know, one of the criticisms, I could see people lobbing at your show is that you come off as a bit of a know-it-all. And is that something that you worry about and you try to work against? Or is it just by virtue of the fact that you're well researched and doing it without any anyone to talk to?

Brian: Well, that's a great point. And you're right. That's a that is a very much a potential pitfall. But something that I say in a number of my episodes is, it doesn't matter whether I'm right or wrong. What matters is, am I at least planting a seed to get you to think about these issues that you've taken for granted all your life? So that's, I think, really the salient point. Because nobody should take my word for anything. You know, that's kind of an old skeptical mantra. You shouldn't believe me more than you should believe anyone else. You should find out for yourself. Hopefully, I'm giving you some tools that will help you to recognize what's nonsense, and help you to figure out how you can go about and finding out what's real. But yeah, I do need to be as right as I can be. I do have, I do have a there's basically a Google group, that, that people, anyone can join and sign up to. And whenever I have a question, something that I either don't have time to research or couldn't find on my own, I'll send it out to these lists. And there's about 250, 300 people on that list. So someone from just about every scientific discipline imaginable. So no matter what my question is, somebody gets back to me very, fairly quickly with, I always require that it be well sourced, and you know that I have the, the proper references and everything. So I can come up with just about anything I need to. And nevertheless, I still get stuff wrong from time to time. And so about every, every 20 or 30 episodes, I will do a one that's called "things I've been wrong about", where I just go through any mistakes that I've made that that anyone's brought to my attention, obviously. And I tell you what I said, tell you what's, what was wrong, what's, what's right, why I made the mistake. Hopefully, you know, making that a learning experience. Because why I made the mistake is at least as important as whatever the mistake was itself.

Ryan: Cool.

Brian: Thank you.

Ryan: Yeah, no, I mean, it's a takes a bigger person than most of the unskeptical I've met to, to come through and admit mistakes and things like that. And I'm actually on your, your Google group for the email. So I get those. And it's, it's, it's fun, but frustrating because I often can't help.

Ryan: Yes, I expect that most people, 90% of the emails that they get, and I usually only send out maybe an average about one a week.

Ryan: Yeah, it's not bad.

Brian: But but most people, it's going to be something that's completely irrelevant. I think the last one that I asked for was the Paleo hydrology of the Salton sink in Southern California.

Ryan: See, I actually worked in a paleo oceanography lab so I looked and I couldn't find it. It was frustrating and I thought, you know, for you had a bunch of foreign language pronunciation ones, I was of no use for at all. Then I finally get one that's, like, near what I'm doing and I still couldn't, couldn't find it. Like, man, no wonder people believe wacky stuff about this.

30:04

Brian: The foreign language pronunciation ones are always funny because someone who's who speaks that language will record it for me and send it to me. You know, you pronounce it like this. Like, like I was trying to get the correct pronunciation of, of Hipparchus, the Greek astronomer, it's a Hipparchus, something like that. But even though they were giving me the recording, I still can't say it. I'm so bad at pronunciation. It's a lost cause. This thing I did this week from Australia. I got an email from an Australian friend who said, oh my god, he really blew all the...

Ryan: But I mean it's a it's a crapshoot trying to pronounce things about Australia. For all Australians listeners, I mean, you know, we make, we make fun of Canada enough that it's Australia's turn to take, take a hit. But yeah, there's that awesome Simpsons line where that guy sees a bullfrog and he asks Marge what it's called and Marge says, oh, it's called, we have them in America, it's called a bullfrog. And he says oh, that's a funny name but he called him chadwazels.

Brian: That's right.

Ryan: Just no rhyme or reason. I don't know what's going on.

Patrick: Yeah. Well it's also the scientific names in particular are, some are not always pronounced in a logical way anyways, the accepted pronunciation doesn't always make sense. For me, what would make the most sense is to break them apart by root word right? But then you have something like Archaeopteryx, which to me it would make sense to pronounce Archaeopteryx.

Ryan: What?!

Patrick: But no one says Archaeopteryx everyone says Archaeopteryx.

Brian: Oh, with a silent p.

Patrick: No, they say the p, like the word, the two roots are archeo (old) and teryx (wing). And so instead of saying Archaeopteryx, people say Archaeopteryx and throw the P in there...

Brian: Interesting.

Patrick: ...because it sounds good,

Ryan: Yeah, Justin and I had a debate about Diplodocus versus Diplodocus just yesterday. It's tricky.

Patrick: It doesn't even it doesn't even really matter. I'm pretty sure none of them were, were meant to be said.

Ryan: Yeah, I mean, they're just meant to be read. They're not, it's very rare that these words get said out loud, which probably says something about how they've evolved in the pronunciation over time.

Brian: Well, my teachers in schools told me Diplodocus, which is yet a third.

Ryan: Yeah, it's a completely distinct, but either way, they were big. Well, you said you also majored in film in school, and you do have a video show now called, *In Fact*, and what can you tell us about that.

Brian: *In Fact*, is an effort that I'm making to bring Skeptoid to a larger audience because the number of people who watch YouTube every day dwarfs the number of people who listen to podcasts every day. So it's something that's still brand new. I have no idea whether it's gonna make sense to do. Doing video is an order of magnitude more of a commitment of time and resources than doing an audio show. Now, I'm well aware of that going into it. So I've committed to do a season of 13 episodes, they're very short, they're only three minutes. Research has shown that nobody watches videos for more than three minutes on YouTube. The half life of people dropping off is just precipitous after the first two minutes really. And I'm trying to make something that is going to be able to work for advertising, or for whatever the business model turns out to be should one ever arise for web video series. So I take in the 13 of the most popular, I, Skeptoid episodes, I think ones that have the best universal appeal, cut them down to just three minutes. And then it's, it's basically me standing there talking and, and pictures going by and, and videos and things like that. Of course, having images, this brings up a whole other issue of copyright. You can't just steal images off the Internet. Everyone does, but you can't legally do that. But so I was really fortunate to get a sponsorship from iStockphoto. So they're sponsoring all the still images. Most of the still images that I have in, in the video series, the name of it is *In Fact* and you can find that infactvideo.com.

Ryan: And we'll put a link to that in the show notes as well as the link to Skeptoid in the show notes of this episode...

Brian: Yeah, thanks.

Ryan: ... on sciencesortof.com

Brian: So yeah, I don't know how that's gonna go. It's, it's been out there for about six months now. And the, so far, the download counts are not very good at all. But, you know, there's, there's, there's no marketing machine behind it. I'm still at an early stage hoping to, hoping to interest someone in the show, so we'll see what happens.

Patrick: So is it, is it a video podcast? Or do you just have it on YouTube?

35:00

Brian: Everything. It is a video podcast. You can find it in iTunes under *In Fact* with Brian Dunning. And it's also on YouTube and all of all the major free video sharing websites. I have an account with with TubeMogul and TubeMogul is a great service. It's ah, their base level of service is free. Anyone who's doing a video series should use TubeMogul. You upload it once to them, they handle all the transcoding and, and uploading it out to all the other video sharing sites. And most importantly, they retract or they retrieve viewer statistics from all of those and they compile them all in a single report for you. So you've got all the demographics and all the numbers and everything of your audience. And that's, that's information that's crucial to have if you if you want to get any advertisers interested in it.

Ryan: But you also have a much more ambitious video project and we asked, we talked to Steve Novella back in December. So it's been it's been a few months and are there updates on the Skeptologist?

Brian: The Skeptologists is a pilot TV show that we shot about two years ago now. And we had, I was the host, but the stars of the show were really these, this team of six experts, PhDs in all these, in all these different fields. And the idea behind the show was that this is the sort of the scientific superhero team. They sort of, they get the bat signal and they jump in the Batmobile and they go off and they debunk something. That was the concept that we had and we shot a pilot and it was, it was okay, it wasn't great. We didn't have much of a budget it was still absurdly expensive. But we shot a pilot. We took it, we did a round to all of the TV networks, all the cable networks. And that was a quite an experience because I'm by no means am I a television industry insider. So, you know, we kind of had a lot of, a lot of strikes against us going into it. But we learned a hell of a lot. And as of now, two years later, we still don't have a deal. What we've been doing about the last year and a half is been reframing and reformatting the show. Since this is something that's now like the, it's, it's on, like the third burner from the back now for myself and the other producer Ryan Johnson, just because it's taken up so much time and so many resources already. We're working on it pretty much as we, as we're able to. But what we've done is the show has a new title, which I can't tell you yet.

Ryan: Ah.

Brian: It has a much improved concept. It's way better. And we are taking it out to PBS. So the idea is to get a PBS grant and to fund a series that we're going to, that we're going to then shoot for public broadcasting. Now the advantage of doing that over network TV is that you have much more control over the content. You don't have to dumb it down. You don't have to turn it into a reality show where people are throwing chairs at each other. And truthfully, that is what the networks demand that you do. Even Discovery even, even the networks that you think of say, like, okay, there, this is a more of a science oriented channel. No, they want reality sensationalism.

Charlie: It's like, back when I was a kid, I feel like I'm old now because I always back when I was a kid Discovery Channel was amazing. But now it's, it's something different.

Ryan: Yeah, yeah.

Brian: Well, they're going, they're following the market. They're doing what the, producing the shows that people want to watch.

Ryan: Yeah, I think The Onion, The Onion had an article called like Science Channel to the public, like, we can't dumb it down any farther. Like, we can't do another show about...

Brian: That's right.

Ryan: Smashing pumpkins for no reason.

Brian: But I don't want to criticize them too much, because we would still love to have a deal with other types of...

Ryan: Well, I love that your genre for that show is reality. And I read that and I'm like, of course, it's about reality because they're investigating paranormal nonsense, but then I think like no wait, and he probably means reality TV, which is this whole other monster, but it seems like...

Brian: Well, we have, we the show that was the Skeptologists, that's still the same show, but it's it's much improved. That's going out to PBS. We also have another show, that is even a better refinement of that. And that is, I think, absolutely ideal for this market that we're talking about. This, this dumbed down market. The reason I say that is because I did, I did, one of my, one of my podcast episodes was about how to make, how to make skepticism and science, how to make it commercial. Because really, what we're doing is we're trying to sell a message that's the opposite of what people want to hear. We're not going to give them easy answers to complicated questions. We're trying to give them reality. Now, that, nobody wants that. Certainly that's not what we're seeing on any of the cable networks or the, or the, the networks. So we have finally come up with an idea that does take real science and it, it shows that reality aspect of it.

40:00

I don't want to, I, we've agreed not to discuss the concept, so I can't tell you too much about it. But it is absolutely friggin ideal and knock your socks off. And it's, it truly is the idea that all science broadcasters have been trying to come up with for so long.

Ryan: Awesome.

Brian: It just, it just absolutely clicks. And so we're really excited about that. And we're working on that too. And that's that's a separate pitch package. That's, that's going out to, to a broader market then, then the Skeptologists, which is pretty much at this point, just for PBS.

Ryan: Well that sounds really cool. Well, is there anything else coming up in the not too distant future that you'd like people to know about and go check out?

Brian: Oh, gosh, it's too much already. As you could tell, I'm spread really thin. So, yeah, I mean, I've got a number of appearances. I'm going to be speaking at, I guess, I'm scheduled for only three conferences left yet this year, which is, which is a small number for me. I'm usually traveling a couple of times a month giving a talk somewhere. So fortunately, the rest of my year looks pretty light. But if you want to come see me give any of my live shows, that's ah, you can go to skeptoid.com and

you can just click on the live shows link and there's a calendar of, of what's coming up. I've been doing a lot of it lately, and I've finally got a little bit of a break. But still some really exciting stuff coming up some big conferences for the rest of this year.

Charlie: You mentioned the the tendency for people to seek the easy answer or the comfortable answer or the quick answer and to find a certain amount of certainty or to find pure certainty. Why do you think that is? Why do you think people have an aversion to uncertainty and discomfort with the unknown?

Brian: Well, I think you just kind of answered your own question. Being in control is something that's a very appealing idea. And if you tell someone that you can control your life by taking this herbal supplement, or by reading this self help book, that's something that people want to be true. And so they're thrilled to give it a shot. When you go to a doctor, and you have a terminal disease, which I hope you don't ever have to have happen. What does the doctor have to do? The doctor is obligated to give you the bad news. Someone who doesn't practice medicine, someone who practices some alternative therapy is not under any such obligation. He can tell you whatever the heck he wants to. He doesn't have any professional Code of Ethics that he has to follow. And just by virtue of the fact that he's in the alternative medicine business, business, you've got a pretty good idea that he doesn't know much about medicine and/or doesn't care much about ethics. So his message to a customer is always going to be the more attractive one, it's the one that someone is going to want to go back and here again. Nobody wants to be told that you can't control your life, that you can't have this magical super health with this incredibly simple solution. Everyone wants to hear that you can. So I think that message is just one that's always going to continue to be, unfortunately, the popular one.

Charlie: Despite how much information and education available to everyone at such low cost. It's just a little depressing.

Brian: Yeah, in fact, you mentioned Skeptics Guide to the Universe. They were just talking in one of their recent episodes about some research that came out recently. You guys may have heard about this, where it was basically just a surveys. It was, they were doing surveys, and they were presenting people with these hypothetical cases, where here's phenomenon x. And it doesn't matter what phenomenon x is, whether it's psychic powers or Bigfoot or aliens, whatever it is. And then they try, they would present this to people with a couple of different combinations of the

general public believes this to X percent, you know, 10% of people believe this, or 90% of the general public believe this. And scientists, either scientists, 90% of scientists believe this or 10% of the scientists believe this. And they tried these different combinations. And what they found out, that no matter what the phenomenon is, people are inclined to believe it if most scientists do not agree with it.

Charlie: Incredible.

Brian: People want to believe the opposite of what science says. And they'll believe anything that their friends and their associates and the general public believe. So people put much more faith in anecdotal thinking than in scientific thinking. So that is a huge obstacle to overcome. And that's something that's ingrained in human nature. Why? I don't know. But it's some, it's a problem that's not going to change and it's not going to go away, no matter what you and I think we can do about it.

Ryan: I always thought that it was because humans kind of are storytelling animals. And we'd rather hear a story than just be told some facts. And I think there might have been a time back in the day when scientists told stories more. And I think that might be coming back from what I can tell just by reading the literature and how scientists have been writing amongst themselves more recently and just trying to popularize what they're doing. But we'll see. Uphill battle for certain.

45:02

Brian: Yeah, the lesson that I've learned and that I think we're really giving a good, making a good attack on, with this new show idea, is that you can make reality as exciting and as sensational and as interesting as fiction. If you just work hard enough to find the right angle. So I think that's what you have to do. You can't compromise and you can't give bad information you have to give good information, but you have to give it so that it's even more sensational than, than the alternatives that are out there.

Charlie: Well, good on you.

Ryan: Yeah.

Charlie: I look forward to the show. Keep fighting the good fight.

Ryan: Definitely. And one thing we we can control how much of your time we took up and we've already taken up more than we intended. So we should probably let you go but thank you so much for coming on and talking to us. This was a, this was fantastic. And if people are curious about tracking down more of what Brian is doing with this time, you can go to skeptoid.com which we will link to in the show notes for this episode.

Brian: Thank you very much. I guess I need to go refill my Lefroy, get this...

Music

Announcer: Hey y'all, it's Trailer Trash Talk.

Patrick: All right, well for Trailer Trash Talk this week we watched *Toy Story 3*. And the trailer we watched was trailer number two on the iTunes movie trailer site. Let's see, I think everyone probably is pretty familiar with how this with, what's going on here, but it's the the Pixar franchise director is Lee Unkrich. Is that right? Unkrich.

Charlie: It looks German so, like Unkrich.

Patrick: Cast is...

Ryan: Sehr gut, mein bonhaut.

Patrick: Cast is the usual. Tom Hanks, Tim Allen, Joan Cusack, John Ratzenberger...

Ryan: Who's John, Joan Cusack.

Patrick: Joan Cusack, yeah, his wife, yes.

Ryan: I thought that was his sister.

Patrick: And then there's John Ratzenberger. Oh, maybe it is his sister.

Ryan: I'm pretty sure that's his sister.

Patrick: I think you're right. You're right. You're right.

Ryan: You are implying incest and I don't appreciate it.

Patrick: I'm sorry. I don't, if I said, John Cusack, it's only because John Ratzenberger was the next person.

Ryan: Yeah, that is, that is confounding, a confounding factor.

Patrick: And then Wallace Shawn. Yeah, so this time around Woody and the gang, I forget, they're, they're sort of the kid who owns them. What's his name, is Andy.

Ryan: Yep.

Patrick: Andy's going to college. And so I guess all these toys get donated to, it looks like a kindergarten or preschool or something.

Ryan: Daycare.

Patrick: And then, yeah, hilarity ensues.

Ryan: I don't know, this is kind of dark. I'm not sure how hilarious they're really going for.

Patrick: It's a little dark.

Ryan: I mean, it kind...

Charlie: Yeah.

Ryan: It kind of looks like a prison movie.

Patrick: Yeah it was sort of the Dirty Dozen with a kind of...

Charlie: The whole first half of the trailer was Paradise Lost or innocence lost anyways...

Ryan: Yeah.

Charlie: Like, boy, boy became man, has to leave behind his childhood.

Ryan: Yep.

Charlie: And then the second half of the, yeah, it was, was they were put in Abu Ghraib with all the tortures and trying to make their escape.

Ryan: Basically, yeah.

Patrick: But it's one of those, it's, it's sort of like...

Charlie: It made me happy, the whole trailer I was smiling.

Ryan: Oh, I know.

Patrick: I don't I don't care for this franchise that much.

Ryan: You're nuts.

Patrick: This story reminded me, or this trailer reminded me of, if you've read the book *Watership Down*, there's a middle section where they wind up, the rabbits wind up with this, this war and with all these other rabbits who act like everything's great, but really they, they live next to this field where the farmer sets out traps. So there's plenty of food for everyone. But they're getting slowly trapped by these, these snares and dying one by one, but they they're trying to act like everything's okay because they need more rabbits to sort of boost their numbers.

Ryan: I think, I think I was just at about the perfect age for *Toy Story 1*.

Patrick: How old were you?

Ryan: I don't know, when did it come out?

Patrick: You're...

Ryan: Oh, oh. I might, I might get in trouble now. I might have said something that I'll regret.

Patrick: You were 17.

Ryan: 1995. I was nine when it came out. I think that's perfect.

Charlie: Pretty perfect, yeah.

Ryan: So *Toy Story 1* has a pretty strong hold on the heartstrings for me.

50:03

Patrick: Let's see 95, I was...

Ryan: 82

Patrick: Yeah, yeah I was too old.

Charlie: I think I went with my little sisters but I was probably embarrassed and hoped nobody would see me there.

Ryan: Yeah. Can you me there with a lady. I was dating when I was dating by the time *Monsters Inc* came out I remember that,I, yeah.

Which is That's

Charlie: Does that tug at the heartstrings as well.

Ryan: It tugs at a different string.

Patrick: That's a, that's the best Pixar movie, is *Monsters Inc*.

Ryan: I didn't see all of it.

Patrick: This is not the place...

Ryan: Okay.

Patrick: You should go back and watch it if you're gonna watch the Toy Stories.

Ryan: Okay.

Patrick: Cuz it's much better

Ryan: Says...

Charlie: It is much better.

Patrick: Actually this trailer looked better than I was expecting, just given the, given the franchise. One wasn't that bad, one, I didn't care for one or two. I don't even know if I've seen all two or not.

Ryan: I think, yeah, I think that's pretty crazy. I like, I like how this trailer uses the crudier animation from the previous two movies as its like selling point because it's, it starts off as, like, a whole movie, you know?

Charlie: Yeah.

Ryan: So you kind of get away with things looking worse in the past because it through this grainy lens of time fade, faded. Because I've heard that the animators have actually had a hard time continuing to make these. One of the reasons Pixar doesn't do a lot of sequels is because the technology jumps ahead so quickly that it's hard to maintain the same visual style with, you want to, you want to make the best looking movie you can...

Patrick: Right.

Ryan: ...and try to make it look like something you made five years ago is tough.

Patrick: So now the technology's actually increased enough that we can make things look bad again.

Ryan: Well, it's just, no, it's a conscious decision on Pixar's part.

Patrick: I understand. I was just...

Ryan: Just being mean.

Patrick: Yes, exactly.

Charlie: No, there's something to that. I mean, that's, a lot of like...

Patrick: Yeah, well, I mean, made in a period...

Charlie: ...and music, they purposely make things sound, sound bad for artistic effect...

Ryan: Yeah.

Charlie: ...but.

Patrick: Yeah. Anyway, it's harder to make a period piece than it is to make a, you know, a piece set in, you know, now.

Charlie: I was, I was just talking about this concept last night, all sleepy and needing to go to bed but it's, it's strange how the technology and the ability to capture images for a specific time period begins to color, I mean, pun quite literally intended, how you view that time period. So, like, the 80s kind of have, like, a funny soft color to them. The 70s have this Technicolor to them and the 60s have this garish color. And then 50s and 40s are black and white and as far as I can tell, like, the world was black and white before 1950.

Charlie: I don't know, does, does that happen to your guys's heads too?

Ryan: Yeah, I mean in the 40s Nazis were evil and that's, that's it.

Patrick: That was that was only news you know. Just good and bad.

Ryan: Who's at the door? I hope that's not Nazis. I just never get tired of Nazi saboteurs.

Patrick: No, you don't.

Charlie: I don't really either, but maybe our listeners do. We got to thumbs up or down...

Ryan: Second time this happened. I thumbs upped this, this trailer last week, if you'll remember. I snuck it in right at the end because I was upset that we hadn't talked about a trailer.

Patrick: Yeah, uhhh...

Ryan: I think this looks great. I'm so happy to have the cast back together. It's, I think it's gonna hit every emotional note that I need it to hit as someone who watched *Toy Story* at the perfect age and has since gone off to college, so, yeah, I'll probably cry.

Patrick: I, uh, I'll, I'll give it a weak thumbs up. Like I said, the trailer was better than I was expecting. So I guess it deserves a thumbs up. I'm still not really looking that forward to this movie.

Ryan: I think financially that is a horrible decision. It's Pixar, man.

Patrick: I said a weak...

Ryan: Gold mine.

Patrick: Oh, man, babies has been killing us.

Ryan: Really? We shouldn't have shorted it. Yeah, oh boy. I warned you guys.

Patrick: Yeah, I didn't think you were right.

Ryan: You never think I'm right. That's the problem.

Charlie: I'm proud of my decision. That's like, I mean, yeah, Goldman stock, Goldman, Goldman Sachs stock is gonna go up, but I'll never, I'll never buy Goldman Sachs because I'm philosophically opposed to it. That was probably

perhaps a little too strong, but I was trying to.

Patrick: Yeah.

Ryan: So well, Charlie, what are you? How are your strong feelings on *Toy Story 3*?

Charlie: Oh, they're, they're pretty, pretty tepid. I'm going to give it a thumbs up. I thought the trailer was really well constructed, and it's perfect. And it, like I said, I was smiling the whole time, but I don't think I'll see it myself. But if we're voting specifically based on the trailer, it's it's a thumbs up for me.

Patrick: Yeah.

Ryan: Awesome. Yeah. Good deal.

55:00

Patrick: All right, well, go to hsx.com. Sign up for a Hollywood Stock Exchange account, and join our league, the Science sort of league and then you can long and short movies with us.

Ryan: Yeah. And it's fun.

Patrick: And there's a lot of other people who do it.

Ryan: Yes, we are one of the bigger leagues on the Hollywood Stock Exchange. So you're joining a movement. We're like Goldman Sachs, we're too big to fail.

Patrick: And scientists don't believe in it. So...

Ryan: They don't? I thought we did...

Charlie: I wonder if we are like Goldman Sachs. If we, if we had all of us vote the same way we could skew it.

Ryan: Ah, I think the, I think the size of the league is probably not enough to push the entire community one direction or another.

Charlie: So we couldn't be our own plunge protection team.

Ryan: We could try. Let's try it. Well, you know, what we need to do, Charlie, is we need to put a movie in production, a toxic asset and then get everyone to buy long on our movie.

Charlie: And then we'll short it.

Ryan: We buy short because we know we'll fail. Wow, I think that might be the first time I finally, I think I might have just made...

Charlie: You did it.

Ryan: Yeah, that's the first time that's happened. Wow, I just blew my own mind. That's rare. Well, speaking of scum sucking bottom feeders.

Patrick: Let's, yeah, let's talk whales.

Ryan: Let's talk whales.

Patrick: Early whales, proto whales.

Ryan: Yeah.

Patrick: Not proto whales, but early whales.

Ryan: Ah, archeo-whales?

Patrick: Yeah, why not?

Ryan: I think that's what they're actually called in the paper.

Ryan: So this week I wanted to talk about a story. It's not, it's not that new, but let's see, when, when does the paper, when does the paper come out.

Patrick: 2009 I think.

Ryan: Yeah. 2009. It's from the Paleo Blog, which is one of the blogs I follow. It's done by Dr. Michael J. Ryan down in the University of Texas. It's a cool blog because he's very into old comics. So, he has a bunch of panels interspersed throughout the abstract of this paper from old Namor comics, which I'm all about. So the title of this paper is "The Morphology and Systematics of Mammalodon Colliveri, a Toothed Mysticete From the Oligocene of Australia". This came out in December of 2009 from the Zoological Journal of the Linnaean Society. Yeah. So Patrick, do you want to help me break down this, this title for people? So mysticete.

Patrick: Ah, so, mysticete, so early whales are sort of just early whales, the first ones were toothed, but then later on, they sort of branched into two distinct morphologies. One is the baling whales, which are the mysticetes and the other are the toothed whales.

Charlie: Like a killer whale?

Ryan: Yes.

Patrick: Yes, like a like a killer whale.

Ryan: And all dolphins are technically a sub group of these toothed whales. Did you say they were called Odontocetes?

Patrick: Odontocetes, yes, that's right.

Ryan: Yeah. But, but the, the toothed version is the original version and the the baleen evolved later after whales were already in the water doing their thing. And if you've ever seen the skull of a crab eater seal, you'll notice they have these really weird teeth. And those, those teeth are not actually used for eating crab, as the name would imply. We talked about scientific naming a little bit earlier and how it can be misleading. The teeth are actually these weirdly grooved teeth, that kind of act as a promo baleen where they, they, you know, grab a mouthful of krill and water and then push the water out with their tongue through these groove teeth. And then the krill don't make it through these grooves and get stuck and then swallowed and that's the same thing whales do. Or at least the baleen whales do to eat is they scoop up a big amount of water, push it out with their tongue and then keep everything through this filter in their mouth to swallow.

Patrick: Exactly.

Ryan: Um, which was pretty, pretty cool.

Charlie: So teeth, their teeth evolved into krill?

Ryan: Their teeth evolved into a baleen which is used to capture.

Charlie: Baleen, yeah, sorry..

Patrick: Yeah, well I don't know that...

Charlie: Krill is what they eat, so what is the, what is the mineralogical composition?

Patrick: Right. So they're...

Charlie: I mean of the baleen.

Patrick: Baleen is, baleen is like your fingernails. It's, it's...

Charlie: That's what I figured it would be. It's looks like it.

Patrick: Yeah. So it's not, it's not that their teeth evolved into a baleen. I guess they developed baleen along with teeth.

1:00:01

They probably coexisted for a while and then as they weren't using, really using their teeth anymore, they just sort of stopped coming in to some degree. So now they're mostly left with they're left with just this keratinous mustache that they can filter stuff with.

Charlie: Does it grow continuously, like, like a fingernail does?

Patrick: Yeah, yeah.

Charlie: Even After they die like a fingernail does?

Patrick: Ah, well, probably.

Ryan: Fingernails don't grow after you die, Charlie, that's a myth.

Patrick: Oh, for like a couple days they do.

Ryan: Well, that's because the skin is retracting.

Patrick: Hmm, that might be true, I don't know.

Ryan: It's a it's an optical illusion. Yeah.

Charlie: Naw, we needed to look this up.

Ryan: Alright, but, I'm pretty sure. Is there a Skeptoid episode on this?

Patrick: I don't know. There should be. I hope he does one on the...

Charlie: I think you're right. Because, because there'd have to be an energy source.

Ryan: Yeah, we need...

Charlie: And an energy source kind of doesn't work anymore because there's no ATP-ADP transfer.

Ryan: Dead is dead. Yeah, it's just a retraction of the skin as you shrink from the dehydration of your cells as you rot.

Patrick: Awesome.

Ryan: Lovely imagery. But, the imagery isn't much better for this paper. Basically, this paper is a tome it's 110 pages. Describing very, very specifically this this one type of whale, the Mammalodon Colliveri, which is an early, what do they, what they call the toothed mysticetes. So before mysticetes had evolved the baleen they still

had teeth. And what the paper was doing was describing the morphology very precisely of this animal. And the authors are arguing that this animal based on tooth wear analysis was actually a suction feeder on the bottom of the ocean.

Patrick: Right.

Ryan: Which is kind of nutty. Like, I just, the imagery of a whale sticking in their face in the, in the mud.

Charlie: Vacuum.

Patrick: One of the other interesting things was that this is actually a sort of a small whale.

Charlie: Okay, a mid-sized vacuum.

Patrick: Well, they, they made the point of saying that you know, it's close relatives are much bigger than it is. And normally the reason you would, like, you know, Blue Whales are really huge because they're able to sort of go right to the base of the food chain, right where the food is plentiful. And so that that makes sense for them. It, this guy is, is, seems like if they're right about what he's doing, he's he's moving down the food chain right to the base where there should be lots more energy available. But yet he's much smaller than his close relatives, which is a little weird if you're gonna be filter feeding.

Ryan: Mmmhmmm. It was, and you said it was smaller. It was about two and a half meters long.

Patrick: Right. Well, I mean...

Ryan: That's pretty small for a while.

Patrick: Yeah, right.

Ryan: I was just trying to give people a number. Yeah. But yeah, so it was, you know, like a, like a big, big dolphin that kind of just went along the bottom, scooping up dirt in its mouth. And presumably filtering, filtering things out of that which has

made its teeth wear away, that's very specific. It lived in the late Oligocene, which was, let's see, ah, Oligocene...

Patrick: I don't know...

Ryan: It's like 34 to 23 million years ago.

Patrick: Yeah. So around around, around, you know, getting close to 20 million years ago is when we're talking about. And that's around the time where these two lineages, that's around the time where these two lineages became distinct and you started being able to tell the, the mysticetes from the odontocetes, where whales really started to diverging. So this is, you know, really early, a really early mysticete.

Ryan: Yeah. One of the reasons whale evolution is so interesting is because one of the earliest adaptations to become a whale is to get your bones really dense.

Patrick: Okay.

Ryan: Which means they preserved pretty well in certain instances, and which means the fossil record is pretty good. And it's also pretty recent and we actually have a lot of transitional forms which is a bit of a loaded term but it is, it is kind of worth talking about since we just talked to a skeptical podcaster with his top episode being on creationism. This is something when creationists say there are no transitional forms, you can point to that for whale evolution, we actually have a plethora of traditional, ah, transitional forms.

Patrick: And the, you know, the really interesting part of early whale evolution that probably a lot of people don't think about or realize is that they're, they're most, they're closely related to well, they're closely related to living animals, like deer. So artiodactyls, and whales are actually pretty close relatives. Which is kind of mind boggling.

1:05:00

Ryan: Yes.

Charlie: Yeah, that's crazy.

Ryan: Do you remember the Ambulocetus from the extreme mammals exhibit Charlie?

Charlie: Um, no.

Ryan: Basically looked like a mammal crocodile.

Charlie: Oh, yeah, yeah, yeah.

Ryan: That's an early whale. So that's what they were. That's the starting point.

Charlie: So are they closer to deer than what other common mammal? Just to...

Ryan: Like a hippo.

Charlie: Just hit one my... okay.

Ryan: Right?

Charlie: And they're probably close, closer to deer than they are to remote sites.

Ryan: Am I wrong about the hippo? Patrick said oh...

Patrick: Yeah, I think you might be let's see here... so, Cetartiodactyla is sort of the key word so I'm gonna Wikipedia that real quick.

Ryan: Okay.

Patrick: So see...

Charlie: In the meantime I'm gonna ask a very innocent question. Why did their bones evolved to be denser? Was this the counter act how much blubber they have.

Ryan: So, they needed, they needed a lot of, yeah, exactly. They needed a lot of blubber to thermo regulate, blubber is very buoyant. So you have to...

Charlie: This, this biology stuff is easy if you're a physicist, you can just guess your way through it.

Ryan: Well, does physics have...

Patrick: Well, it's easy if you're a biologist too.

Ryan: It's easy, yeah, I was gonna say, the physics stuff is easy if you're a biologist because you actually have enough social skills to go ask a physicist.

Charlie: That's true.

Ryan: Bazynga!

Patrick: No, ah...

Charlie: That's no way to publish a paper, you just say this stuff's easy.

Patrick: Hippopotamidae are proud members of Cetartiodactyla. So they are, they are, they are a mammal that's, that's related to whales.

Ryan: Okay.

Patrick: That you would sort of, sort of expect but, but whales are more closely related to say deer than they are to say seals.

Ryan: Okay. That, that...

Charlie: That's crazy.

Ryan: That's crazy, yeah.

Charlie: Because a seal looks like a dog.

Patrick: Right. And they are, they are carnivorants. They're members of a clade, carnivore. So they, dogs, all otters, all those Mustelids, the Badgers and whatnot.

Charlie: I like that clade.

Patrick: Yeah, it's, it's pretty cool. It's got lots of the smart mammals because you kind of have to have a big brain to go hunt things. And so you shouldn't confuse carnivore with carnivores. So carnivores are meat eating animals, meat eating, yeah, animals. And carnivorans are specific clade of mammals that most, they pretty much all are carnivores just about but that's really coincidence, I guess.

Ryan: And they share, and the, they share a lot of, a lot of the same adaptations that whales have. Whales are pretty sweet. So the next time if you ever in an argument with a creationist, and they ask about transitional forms, you can bring up our friends, the whales.

Charlie: And specifically, this guy, what was he, Mammalodon Colliveri?

Ryan: The Mammalodon, is kind of a side branch of this early mysticetes evolution. I'm not sure how great it would be as a creationist argument, but it is an interesting tidbit about early mysticetes diversity.

Patrick: I think it's interesting that they were already playing, even though they don't, they didn't have baleen, they're already playing around with filter feeding, so that's cool.

Ryan: Yes, yes.

Charlie: So how do bottom feeding fish like perch and halibut, get their, make their living?

Ryan: Like what, what are they eating? Or how are they eating?

Charlie: They kind of do it differently, like, I mean, I've, I've watched perch, like, at the bottom of the lake I grew up on, and they just they suck a bunch of mud in and then they blow it out their gills.

Patrick: Right. Yeah, they have a sort of a built in filter already, with their sort of, the gill rakes. So they don't, I guess, mammals obviously don't have gills, so you have to force the water out the same way it came in.

Charlie: Kind of like the old school baseball pitcher chewing tabacky.

Patrick: Yeah.

Charlie: Right? Their, they spit, they're spittin out...

Patrick: Yeah.

Ryan: Chaw...

Charlie: Yeah.

Ryan: Nice.

Patrick: Pretty much.

Ryan: It would be great as well was discovered in like Copenhagen. But I don't think it was.

Patrick: No, Australia. And actually there's lots of, so, India is sort of, I think one of the leading locations for where this early whale evolution probably happened. This transition from terrestrial form to a, to a fully, fully aquatic and marine animal, India. And then early, really early whales are found in New Zealand. And apparently now, Australia, as, well, although this is later in whale evolution. But but sort of that area, the indo Pacific areas kind of were early, it looks like early whale evolution was going on as well as what is called the techies sea. So that's sort of from India through to Europe. A lot of that was underwater. Anyways, extending sort of Northwest and Southeast from India is sort of where the hotbeds of this is going on.

1:10:11

Charlie: So India, India, up to Europe was underwater.

Ryan: Yeah. So the bottom line of this story is that this whale did this cool feeding strategy back in the day that may have led to somewhere.

Patrick: All right, speaking of exposing the error of our ways, let's do the Paleo POW.

Ryan: Oh yeah, definitely. Let's do that.

Charlie: Paleo POW.

Music

Ryan: So now we're on to the Paleo POW, which is where we each pick something every week from the larger Paleo Posse community to highlight, talk about, lavish praise on or suffer the critiques of. This week promises to be no exception, and we'll start it off with Charlie.

Charlie: Right. All right, so my paleo POW. I was struggling with this one because it points out the fact that we have multi generational listeners. And so this one comes from Ed and he writes, "This is my first email to Science sort of, I'm old", so it's not me being ageist here. He writes, "I'm old, but I still find your podcasts most entertaining and up to date than any other podcast. I have no idea how to become a Paleo Pal but I've been listening since I got this pod touch last summer."

Ryan: Quit touching your pod old man.

Charlie: "I'm a retired carpenter and I think science is everywhere and all around us. I do consider math, physics and all the ologies and chemistry to be subsets of science. I like the fact that you show, that you show science is anything but dull. Thanks, Ed, sent from my iPod". So he's got it figured out.

Patrick: Yeah.

Charlie: And he's a Paleo Pal just by, well, he's a Paleo Pal just by listening.

Patrick: Excellent.

Ryan: Nice. That's very generous of you Charlie.

Patrick: Well done. Science is all around us.

Ryan: I'm, well, I'm sitting in the lab. So yeah, literally, like, we're talking about the whale story. I've got a dolphin jaw, arm's reach from me.

Charlie: And I think, actually, um, epistemologically he is a Paleo Pal, because he called himself old and he's a friend of ours. So old friend.

Ryan: That's amazing. Wow. Oh, I enjoyed that. That was good. Well done. Well done, Charlie. That's what I needed. Well, I guess I, ah, continue, continue on with the segment, with, okay, so, we got it. We got an interesting review on iTunes. It's maybe the perfect type of review that we should be looking to get. It does three things very well. One, it is clear, the gender of the writer. So I can say he and not have to feel like I'm being a sexist, jerk, pig, whatever.

Patrick: Right.

Ryan: He gives us five stars. Another great thing to do when you're writing a review. But he actually does give us some constructive criticism. So I will I will read the review and, verbatim, and then comment.

Patrick: And it's also, um, I don't, I'm not sure why, how it showed up in our store because he claims he left the review in the South Korea store.

Ryan: Oh, well...

Patrick: ...iTunes...

Ryan: The way that works is if his account is from a, like, a you US guest thing then his review shows up in the US. Yeah, but he did email this to us. James emailed this to us so we would know about it because he posted it in South Korea. But because his account is a US account, it's showing up in the US store. So there you have it. He says, "On average, I love everything you do. But as great as your geek knowledge in the fields of science, your knowledge of Geek nerd pop culture is dreadfully lax. Not that it affects my love to the show in the least. The avatar. *The Last Airbender* review, I found, was uninspired and actually lazy. Your facts were off on the production of the source material. A quick wiki search would have made that section much more enjoyable, but I won't fault you for not doing your homework on a subject that doesn't interest you. Now on...

1:15:00

Patrick: We've been criticized for that, that review for...

Ryan: Yeah, that's hurt us, that's hurt us.

Patrick: Yeah.

Ryan: "Now to the point of the review title", I think I forgot to read the title. The title is "Oh, woe to SW". "You seem to be, you have seemed to be mild fans of *Star Wars* but you make huge and extremely common assumptions on many things from that fictional universe. I'm sure that many others have emailed in at this point, and detailed the mistakes without skimping on the nerd rage, but I wanted to cast my lab on the subject as well without boring you to death with minutiae. As an English teacher in South Korea, I love getting to listen to debate in my native tongue. It makes my inability to thoughtfully communicate with my peers and co workers much more tolerable. I feel a kind of kinship with you guys due to your more or less frequent journeys outside our homeland. I feel like you may understand the difficulties of communication that is a huge factor in my daily life. You guys are like digital friends created from the ether, from the internet, or I think he meant to write...

Charlie: Ether.

Ryan: Of the internet itself. Here's hoping you never have to suffer the travesty of a Korean beer Cass. I'm looking forward to listening to the rest of your fine podcast, James".

Charlie: Cool.

Ryan: Yeah, so thanks. Uh, we actually haven't gotten any emails complaining about our Star Wars knowledge.

Patrick: Ah, we have a little bit, it seems like. Back when we did the R2D2 flying around we got an email or two that, that found fault or...

Ryan: I will readily admit that my *Star Wars* knowledge is coming from the movies and I'm a huge fan of the movies, not just a mild fan. But, really, only the movies. I don't spend a lot of time with other stuff. I played a couple of the video games but never, like, the books or the comics or anything like that.

Charlie: I confess my lack of *Star Wars* knowledge at the start of episode 37. And I need to point out what other lack of knowledge here. I said epistemologically speaking a moment ago. And that's the study of knowledge. I meant to say entomologically speaking. That's the study of words.

Ryan: I thought, I thought that was ah, yeah, I didn't want to be pedantic but yeah I was thinking about that.

Charlie: And not to be confused with entomologically speaking, that's the study of...

Ryan: Insects.

Charlie: Insects, yeah.

Ryan: Well, one other, one other thing about James' review, I mean, you know, a quick wiki search would have made it much, made it very obvious, that Avatar is spelled with two "a"s and not an "i". So, pot, meet kettle, turns out we're both black and make lazy, uninspired mistakes like spelling. Sorry, I hope that didn't come off snarky. I was just trying to poke fun at all involved but, yeah.

Patrick: Ahhhh.

Charlie: No, that was funny. I think he confused, I was trying to count how many paleo...

Patrick: Well it's good, he needs an i for his ether so he can just move that one down...

Ryan: No, he needs less "i"s for his ether. He has an either instead of an ether.

Patrick: Oh, okay.

Ryan: But, yeah, so, all in good fun. Sorry we fucked up the *Avatar* thing. He's right in saying we don't really care about *Avatar*. It looks like an anime so I assumed it was, my bad.

Patrick: I kinda like the look of that one, I didn't watch it.

Ryan: Yeah, well, the cartoon looked like an anime...

Patrick: Yeah, yeah, it does, it does look like an anime. Yeah, we didn't know.

Ryan: And we didn't bother to look it up so.

Patrick: We didn't do the leg work, fair enough.

Ryan: Finger work.

Charlie: Boo on us.

Ryan: Yeah, we'll take it. He still gave us five stars which is...

Patrick: Which is good.

Ryan: That's the key right there.

Charlie: Yeah.

Patrick: Yeah, I want to try a cast now.

Ryan: Just to see how bad it is?

Patrick: Yeah.

Ryan: I mean, I imagine it's just a microbrew lager.

Patrick: Yeah, so what.

Ryan: All right. Let's do it.

Charlie: I think we deserve it after screwing up the *Avatar* review.

Ryan: Alright James, send us some Cass. Please. We'll send you, we'll send you some good American beer back if it makes it through South Korea's.

Patrick: Yeah, I don't know if you can send it through customs or not.

Ryan: I think you just, I think you declare it not beer. We'll see. Patrick. What do you got for us this week.

Patrick: Ah, my Paleo POW this week is short and sweet. It's a tweet.

Ryan: A short, sweet tweet.

Patrick: Yep. It's from, how do you think you say that? Brian Quidell?

Ryan: I said Quadell.

Charlie: Quadell.

Ryan: Quadell. A waddling Quadell. I don't know.

Patrick: I ah, "I'm loving your blog. I wish the world had a whole army of you."

Ryan: His name is Michael. We can just call him Michael.

Patrick: Michael.

Ryan: He's from Cincinnati. So, I hope he's enjoying some Skyline.

Patrick: Chili. Not beer.

Ryan: Well, I mean, the skyline of Cincinnati is on the can of the chili so if he was enjoying the chili he would, de facto be enjoying the skylines.

Patrick: Yeah, I just, we'd just been talking about beer, I was just making sure that people that didn't know what Skyline was weren't just assuming that it was a beer.

Ryan: Ah, yes. That was, that was actually an intelligent point to make. And hopefully he's not a Goldstar man, otherwise we're going to unfollow him from the Science sort of account.

Patrick: Actually, we probably won't.

Ryan: I'm keeping an eye on his tweets though to see if he says anything positive about Goldstar.

Charlie: What was...

1:20:00

Ryan: So, about the blog...

Patrick: Yeah, so if you haven't visited our blog, ah, you should. It's easy to find. You can link to it from the Sciencesortof.com page or go to Paleocave.sciencesortof.com and it's pretty active. We've got a story a day up during the week. So, it turns over a lot. So, even if you have been there's new stuff there since you were last visiting.

Ryan: And it's diverse.

Patrick: It is diverse.

Ryan: You're not going to get the same thing twice. I mean. You know, Jacob killed it with his stealth tech article last week and this week he comes out of nowhere with why it's morally okay to kill mutants so, you know, just cuz we've got an engineer writing doesn't mean that you're going to get something that seems like it's coming from an engineer. Other than the quality.

Patrick: Which is impeccable.

Ryan: Yeah, I think it's, I think it's a good thing.

Patrick: Okay, just making sure.

Ryan: Yeah, yeah. For sure. Alright Charlie, let's see how many twitter followers you've got.

Charlie: Oh no.

Ryan: It's time. How many, how many did you have last time?

Charlie: I had 25 two weeks ago, 27 a week ago.

Ryan: Okay. And the goal is 50.

Charlie: Yeah.

Ryan: You're at 31!

Patrick: Ooooh.

Ryan: That's a bigger jump than last time.

Charlie: I may send out a tweet before 50. I'm gettin' antsy here.

Patrick: You're getting warmed up.

Ryan: You're ready.

Charlie: Yeah.

Ryan: You've composed it.

Patrick: You thought of something really clever.

Ryan: In 140 characters or less.

Charlie: Yeah.

Ryan: Alright.

Patrick: He's losing enthusiasm.

Ryan: Okay, let's, well, if you're interested go to twitter.com/CharlesBarnhart to follow him. Actually, you know what I did? Let's do this. I, ah, if you go to twitter.com/sciencesortof, I created a list. So, when you go to twitter.com/sciencesortof there are, it's this little list function that they, that twitter does and one of our lists in the Paleo Pals list which has the three of us and Ben and Jacob and you can just click follow this list and then it will be like you are following all of us but it only takes one click.

Patrick: Nice.

Ryan: How about that, you like that?

Patrick: I like it.

Charlie: It's very clever.

Ryan: Yep.

Patrick: The simplicity.

Ryan: I do it again for the Paleo Posse. Because I care. I think that about wraps it up for this week. Thanks for listening, we'll see you again next week, the big 40. Is that, is that a milestone. I mean, not really. We're a dozen, a dozen from a year. Jesus.

Patrick: That is hard to believe actually.

Ryan: Yeah, well, we started in...

Patrick: In some ways. In other ways it's not so hard.

Ryan: ... as long as it's been, ah, but.

Charlie: It's pretty awesome.

Ryan: Yeah. And, and, well, it's all the listeners, it's all the Paleo Posse pushing us along every week. Like, last week was rough and the show was late and I apologize for that. That's, you know, I take full responsibility for the, needing to sleep, ah, but I mean, it's okay. The show's out and I hope you guys enjoyed the quiz show and keep sending in those questions to Paleopals@sciencesortof.com. Check out the website at sciencesortof.com and the blog as Patrick mentioned. I think that about wraps it up. So, we'll see you again next week, the big 40.

Charlie: Hear, hear.

Ryan: Where we'll be bringing you more Science...

Patrick and Charlie: ...sort of.

Ryan: Bye.

Patrick: Aack.

Charlie: Au revoir.

Announcer: Thanks for listening to Science sort of. Our show notes are available at sciencesortof.com, which we'll have links to all the stories we talked about today. You can follow us on twitter@twitter.com/sciencesortof, you can get in touch with us at paleopals@sciencesortof.com or on our Facebook fan page. A great way you can support the show is by subscribing to our feed on iTunes and writing a review so other people have a better chance of finding the show. And if you have a friend you think might be interested, tell them to give us a try. That's all for this week. Thanks for listening, and see you next time on Science sort of.

Music

Brian: What the heck is that sound.

Ryan: Charlie is doing something.

Charlie: I'm sorry, I, I'm recording in San Francisco and a motorcycle just went by or something. Or it could have been a...

Brian: Your drink was coming out the other end.

Transcriptions provided by Denny Henke of Beardyguycreative.com