

Episode 37

Patrick: Did you see that Weird Al Yankovic thing I retweeted today?

Ryan: No, I didn't .

Patrick: Weird Al says, ah, "I've been thinking a lot about this and I've decided my favorite Wookie is Chewbacca". And then he hashmarks and he says, ah, "useless hashmark".

Ryan: That's funny. I'm not, yeah, that's really funny.

Charlie: Favorite Wookie is Chewbacca? What are the other Wookies?

Patrick: That's why it's funny.

Ryan: Yeah.

Charlie: I don't know enough about Star Wars...

Announcer: Hello and welcome to Science sort of.

Music

Ryan: Hello and welcome to Science sort of episode 37. This week's theme is the high ground and as always from their lofty perches on their ivory towers of academia are the Paleo Pals. And joining me tonight are Patrick.

Patrick: Hello Paleo Posse.

Ryan: And Charlie.

Charlie: Word to your mom.

Ryan: I'm Ryan. I'll be your host and we're going to start off each show as we always do with what we're drinking and normally that provides some, some lofty brews indeed. So, Patrick, why don't you start us off.

Patrick: Starting with the loftiest of brews, my all-time favorite brew, Guinness Draft.

Charlie: Nice.

Ryan: Interesting.

Patrick: Ah, well, it actually, we're now on Guinness Store Affiliates. And so I'll try and get that, a link to the Guinness store up on our affiliates section of our website soon. But, um, in the mean time, have yourself a Guinness.

Ryan: Oh, alright, yeah.

Charlie: That's a wonderful affiliation.

Ryan: You didn't even tell us about that. We, we were being surprised live on air here.

Charlie: Very cool.

Ryan: Yeah. Will have to buy something from Guinness.

Patrick: I'm working on, I'm working on another one, this, ah, other store that sells kegerators. Which could go very well with our, with some of our posse indeed.

Ryan: Yes but you should be drinking your Guinness at a much warmer temperature than a kegerator would likely be keeping it.

Patrick: I guess.

Charlie: I'm sure you could set it.

Patrick: Yeah, in Ireland they actually serve Guinness extra cold as well. They have a regular and an extra cold in a lot of bars

Ryan: Yeah.

Patrick: So I don't know what the, what you should be doing.

Ryan: You're not one to, you're not one to tell others, tell people how to consume their various food products?

Patrick: Exactly.

Charlie: It's for the individuals enjoyment, so, however they like it.

Patrick: However you like it, yeah.

Ryan: This is called foreshadowing. Charlie what about you?

Charlie: I am actually, I'm not drinking right now, because I'm going to a concert later tonight and I was just going to...

Patrick: Save it.

Charlie: Yeah, I don't need to be drinking all night long, that, in moderation, right? And so I...

Ryan: That's mature.

Charlie: So I just poured myself a shot of espresso and it's, I got some nice beans from Ritual Coffee Company and they are chocolatey and delicious.

Patrick: When are you going to drink some of that civet coffee Charles?

Ryan: I was just about to ask that?

Charlie: I need to order some don't I? All right I'll get on it.

Patrick: All right. Make sure you use our affiliate page.

Ryan: Well it seems like maybe, well definitely unintentionally, because we don't talk about this beforehand, but we were unintentionally thematic with our drinks because we're all drinking something dark and syrupy because I am having a Beer Geek Breakfast from Mikkeller Brewery also in Norway. My beer last week was from Norway and I bought these at the same time so I was curious to check this out. And it's been a long week so I wanted something with maybe a little pick me up. So this is an oatmeal stout brewed with coffee. So it's the bridge between Patrick and Charlie.

Patrick: Nice.

Ryan: Yeah, I'm really excited because I've been saving this one for a while for that perfect moment when I just, I wanted to the beer to relax with but one that wasn't going to put me to sleep. So hopefully this will do it, and that is a creamiest, foamiest head I've seen in a while so it's going to be a minute before I can take a sip.

Charlie: Well, speaking of beer, oats and coffee chocolate and other ingredients...

Ryan: Speaking of things like grow out of the ground?

Charlie: That we soon ingest.

Patrick: Speaking of fermented grains, because birds eat wheat...

Ryan: That's true.

Music

5:00

Patrick: I found this article, so this is actually a popular press article from the *LA Times*, reporting on an article out of Newcastle University in England and a lead researcher, Lisa McKenzie, she did a study involving birds in England and their preferences for organic food vs conventionally grown food. And so the science is a

little silly. I mean, you could do this for your fifth grade science project if you wanted. She basically just build up filled up a couple of bird feeders one with organic food and one with inorganic food, I think it was wheat, they were both filled with wheat. Yeah organic wheat and conventionally grown wheat, ah, filled up bird feeders and they just marked off in graduation so they could tell how how much wheat was in there and then just let the birds eat and it turns out they ate more of the conventionally grown wheat. About 55% of the food eaten was conventionally grown, about 45% was organically grown. So, the upshot is, it looks like birds prefer conventionally grown wheat.

Charlie: So these birds, these song birds seem to prefer the “conventionally” grown food but, I mean, I didn't read the actual full article in the *Journal of Science of Food and Agriculture* and I'm having difficulty talking, but, from this press release, I mean, it sounds like they were more concerned with the protein and I'm sure there are other variables too, like what about crunchiness or how stale different foods are or you know, whether or not the husk was easier to get through on the conventionally grown food than the organic grown food. I'm sure there are other variables that sway the birds' opinion rather than conventional versus organic, I guess.

Patrick: Yeah I'm sure they're not conscious of conventional versus organic....

Ryan: I wasn't conscious of it until I moved to Santa Cruz.

Patrick: ... classification. Really?

Ryan: I mean, here's, when I first moved to Santa Cruz I was, you know, a freshman in college, I was eating at the dining hall and I sat down with this plate of food, and this, I'm just this, you know naïve little kid from West Virginia. And this guy asked me, “oh is that organic?” and I looked at him and went yeah of course it is, it's food. So, like, I, I, legitimately didn't understand that there was a distinction. So I can't expect birds to be smarter than me.

Patrick: Right.

Charlie: This study just seems a little, I mean, it seems a little sloppy to me because...

Patrick: Well I don't really understand the point of it. So, right, their, basically, their conclusion was that the conventionally grown wheat I had a higher protein content and they think that was why the birds were choosing it. But, but, similar to us, they have a, they interview a guy who has, who is into organic food, Charles Benbrook. He's the chief scientist at the Organic Center in Boulder Colorado and he thinks they're just bad mouthing organic food for the heck of it.

Ryan: Right, because it's, you know, that's what, I mean, that didn't make any sense to me, that's not what scientists do. Scientists, I don't know, I guess you could have a political agenda but just, I don't, I don't, I don't see scientists developing studies just to badmouth a movement.

Patrick: Well really the only reason they might choose organic foods is if they could actually somehow detect the pesticides that the...

Charlie: Right.

Patrick: ...conventional foods were grown with, the birds I'm talking about. And so I guess this basically says that they can't.

Charlie: Yeah, I mean, the labels organic or un-organic, non-organic are just that. They are labels, you know, posited by human beings so we have to look at what the food is actually made out of. What chemicals are on the food that's what's going to change a bird's opinion.

Ryan: Right. Well it just, I thought it was really interesting that the guy who was the, the mouthpiece for the organic movement said that, conventionally grown crops, he admitted that conventionally grown crops are higher in protein which I don't think that this study was positing, is like, you know a universal truth among the difference between organic and conventional grown food, which I doubt is even true.

Patrick: Right. Yeah.

Ryan: But he said organic foods are even higher and vitamin C and antioxidants which he doesn't cite a source, he just says it.

Charlie: This is just ridiculous, it has so much to do with the growing conditions, the actual strain, the genetic strain of the crops.

Ryan: But wait then he goes even farther and he said says that vitamin C and antioxidants are helpful nutrients that unlike proteins are lacking in the Western diet which again, there's no citation there's no source. I don't know it just seems, it seems like he's really playing it really fast and loose with his facts just because his facts tend to mesh better with the popular consciousness right now.

10:00

Charlie: I mean yeah you can get antioxidants out of Sunny D but that doesn't mean it's good for you.

Ryan: And vitamin C. You can buy vitamin C in pill form and just chew it.

Patrick: Well, also it's pretty clear that...

Charlie: Snort it.

Patrick: Most Westerners aren't really that vitamin, that vitamin C deficient or we'd all have scurvy.

Charlie: Right.

Ryan: Right, right I mean a cup of coffee has a ton of antioxidants, I don't know. Robert Goldberg a professor at UCLA's Department of Molecular Cell and Developmental Biology said that "there's no scientific evidence that organic food is better than food grown conventionally" and he further goes on to say that "it's one of the most popular non-scientifically supported myths out there. Which I thought was really a very strong statement that I'm inclined to agree with.

Charlie: Yeah, I mean, there is nothing in and of itself virtuous about organic food. Again, it just comes down to what, what it's actually made out of.

Patrick: It comes down to whether, you know, whether you fertilize with ammonium nitrate for horse poop.

Ryan: Yeah, I mean you were still using fertilizer, you're still, I mean there are even organic pesticides out there. There are pesticides that are certified organic. They are not nearly as effective as conventional pesticides so you end up using a lot more of the organic pesticide on the soil that you would if you used a conventional pesticide but you are still at some point dumping chemicals on the ground to help your crops grow.

Patrick: And I heard, not that I know this much about this, but I heard a story on NPR about trying to figure out what organic milk actually means. Like what do you have to do to a cow to certify that it's milk is organic. Like, obviously you're not treating the cow with pesticides.

Ryan: Ah, from what I understand it's that the cows can't even feed on grass that's been treated with pesticides. I have a, I have a friend who works at a, I have a couple friends actually, that work at organic certification agencies, and it's kind of interesting because there is a lot, the, the laws, like Charlie said earlier, it's a label, like it's just a word. So, you have these certification agencies that determine who gets to use this word and who gets to use this label. And the big companies, because another thing that a lot of people might not realize about organic food, is that most of it is still coming from giant corporate farms. It's, you know, if you're buying it in the grocery store, even if it's organic, it's still not likely coming from the local guy down the street. Because the big farms have realized that they make more money when they do organic. And, and she was telling me that they've had problems with some of the bigger organic milk producers because they cheat. I mean why wouldn't you if you could get away with it?

Patrick: And charge more.

Ryan: Yeah, if you can get away with charging more for milk that's not organic, but you can charge the organic price, because it cost more to produce the organic milk, you are increasing your profit margin because chances are you're not gonna have an inspector out there watching your cows all day, all the time. And even when they do get caught, which they have, you know because they move cows around to different fields and don't let the organic certification agencies know, even when they get caught, there's no not really any punishment. Like, they don't, they aren't forced to remove the label from that batch of organic milk, they are not fined anything because the certification agencies don't have a power to fine. There's not even

really a threat to remove the label in the first place which is they should have control over. So I don't know I get very skeptical about paying extra money for something I can't even be sure is organic.

Patrick: I'm not sure why you would in the first place.

Ryan: Right, yeah, because a lot of people, well a lot of people talk about bovine growth hormone, that's another one of the big conventional versus organic things, but I've never seen any study that shows that bovine growth hormone is biologically active inside of a human stomach.

Patrick: I don't know, I mean that, the growth hormone stuff kind of freaks me out but you can buy, almost all milk that you buy in the grocery store now doesn't contain...

Ryan: Yes, this is true. Yeah.

Patrick: Whether it's organic or not.

Ryan: Yeah, but, so let's get back to the study a little bit. I mean, so, it sounds like they're making the argument that the birds are just eating the organic food because they're getting more nutrients from it, they're getting more protein.

Patrick: Right.

Ryan: And why wouldn't you, you know? Why wouldn't...

Patrick: Well, yeah, if you could discern it.

Ryan: Yeah, well, that was the thing that they were saying it's that the other studies are too short term for the birds to have discerned it and that this study was the first one that gave the birds enough time to figure that out.

Charlie: I don't know, I'm not convinced. I mean, the only thing a bird has is taste and so, I mean, it doesn't know that it has more protein. It just likes the way it tastes better and that could be, there could be myriad reasons why it tastes better to a bird.

Patrick: Yeah, there could be.

Ryan: You think things tastes better when they have more protein Charlie?

Charlie: No, I don't know. Not necessarily. They taste better when they have more fat, sugar and salt but I'm a human being.

Ryan: Ah, yes, you are a human being. So we think. Most people have only ever heard your voice.

Charlie: And...

Ryan: Could be a very intelligent robot.

Charlie: I think the scientists in this study latched onto the protein variable just because that's a, an exciting point to make.

15:08

Ryan: Yeah.

Charlie: That's an exciting point to make, that it's more nutritious. But it easily could just be, I mean these foods were grown in different conditions, they were probably shipped in different conditions so it could even be like, a humidity argument. Maybe one is more humid than the other. Maybe one is more stale than the other. It's absurd.

Patrick: Well I don't think, like I said, we haven't read the actual article but I bet that the upshot is more that, I'm not even sure this is a significant, like statistically, I'm not sure how significant this difference is in organic versus in-organic. But it certainly says that they don't prefer organic foods.

Ryan: Yes, okay, I see that, yeah.

Charlie: And I could've told them that before they started it, because it's a bird. It doesn't place value judgments or moral judgments or any sort of concern on the thing it's eating.

Patrick: Okay, well at least organic foods don't taste better to the bird.

Ryan: Right, right.

Patrick: For whatever reason.

Charlie: Grrr, this study is annoying.

Ryan: Yeah.

Patrick: All right well...

Ryan: I don't know. It's something I know people feel really strongly about.

Patrick: Yeah, and we are not advocating that you not eat organic. If that's what you, if you like it better for whatever reason feel free to buy organic food.

Charlie: Yeah.

Ryan: I wish, I wish, it seems like the organic food movement is coming from the presumption of scientific righteousness. And I am not sure I buy it yet because I don't think there's been enough data. Is that fair? I'm trying to be fair.

Charlie: Yeah, my advice would just be to take it upon yourself to become informed with what you're eating and don't just buy something because somebody tells you that it's good or better than something else. Like actually understand what it involves. I mean, one thing that I personally think that people should concern themselves with is how much energy goes into the production of their food. And that, that involves more things to do with how low or how high on the food chain that your food is or how far away it came from to arrive at your house. I think that's, that, that does more for, you know, for climate change and the energy crisis than choosing organic foods. And as far as your health goes, look at, look at all aspects of your life and decide what's the zero and first order of things to solve with your own health. Are you getting enough exercise? Are you doing something bad for your health like smoking? I mean, organic versus conventional food is probably pretty low down on the list as far as what's going to kill you first.

Patrick: So Charlie, you were mentioning, basically, eating locally as one thing that you can do to lower your energy cost in terms of, you know, your carbon footprint. And lots of Californians get equally up in arms about that and that's, partially because it's easy for Californians to do. There's so much grown in the Central Valley that it's easy for them to talk about how they always eat fairly locally. And it's much harder to do if you live in, you know, Wisconsin where it gets really cold for part of the year and hard to grow things.

Charlie: Yeah.

Ryan: Well then people shouldn't live in Wisconsin or Tibet.

Patrick: Well, you know, that's kind of...

Ryan: More foreshadowing, more foreshadowing...

Patrick: Um, but, but, you also mentioned eating lower down on the food chain, which is something everybody should be able to incorporate into their diet if they think about it.

Ryan: Moss.

Charlie: Yes. Yeah, so, a little factoid, is that for each step up in the food chain you go you lose roughly 10 calories or 9 calories. So, if you eat, a calorie of beef costs 10 calories worth of grains. So, you could eat a handful of oats or a thimbleful of beef and it would be the same energy cost.

Ryan: My beer has oatmeal in it, Charlie, do I get points.

Charlie: You would definitely get the points.

Ryan: Instead of beef beer.

Charlie: Yeah.

Patrick: Whereas Guinness is supposedly marinated...

Ryan: Oh, yeah, that's right, a sheep or whatever it was.

Patrick: Yeah. A dead sheep or a dead cow, marinate some Guinness so I guess I loose points.

Ryan: Yeah, Patrick.

Charlie: I loose tons of points because coffee is very energy intensive and comes from far, far away.

Ryan: I was going to say, but, Patrick, both our beers are coming from Northern Europe too, so.

Patrick: Yeah, that's true.

Ryan: The other side of the world. Yes, so, but speaking of people who are going places...

Patrick: Let's talk about *Whiz Kids*.

Ryan: *Whiz Kids*, the musical. Doesn't it sound like it should be a musical?

Patrick: Yeah.

Ryan: We're the Whiz Kids, we know lots of great stuff. Doin' some science, all on our own.

20:02

Charlie: We cut out the fluff.

Ryan: We cut out the fluff...

Music

Announcer: Hey ya'll, it's Trailer Trash Talk.

Patrick: Yeah, so this week on Trailer Trash Talk it's *Whiz Kids*, it's a documentary film by, directed by Tom Shepard and, did you guys watch this trailer?

Ryan: Yes. Yeah.

Patrick: Charlie?

Charlie: I watched 70% of it.

Patrick: That's passing I guess.

Ryan: Not for these kids.

Patrick: C-.

Ryan: 99% or 98% is failure to them.

Patrick: Yeah, it's not good enough. Ah, so this is basically about, it basically follows several kids who are involved in science at, sort of, high school and maybe middle school level, at a very high level.

Ryan: It said they were 17 year old, so, that's high school.

Patrick: Yeah, high school. Ah, yeah, so, at a very high level. So they're doing independent research and some of them, you know, they're winning national science competitions and being employed by, or, employed or interning at companies like, like DuPont. So, they're pretty into it. So, before, that's enough of a premise to go around the table I think. Who wants to start with their impressions?

Ryan: I was nervous about this trailer. If only because we had a second, this is our second documentary in two weeks but it also is the first time that we've done a trailer not from the Apple site so I was scared to go out in the dark forest of any old internet trailer.

Patrick: It's not the first time.

Ryan: I, I was close to fighting against it and then I watched it and I hated it. I, I, despise the three children presented in this trailer. They seem like the complete antithesis of everything our show tries to be, so, I'll say that and then open it up for discussion before going on a much longer rant that I have prepared.

Patrick: Yeah, a little bit...

Ryan: Let me get the rant out, alright, go ahead guys, I'll just re-read my notes.

Patrick: Ah, I, guess I had some of the same issues with it. I'd hoped, kind of, to see a film about, and this is, I've talked before about how I like reading about math and it's because math is similar to professional sports in some ways in that the people who are really good at it just love to it and they wouldn't do anything else, they'd do it for free. And so I was hoping to see something like that in this trailer, but I really didn't. Like, these kids are stressed out and worried about grades and I'm not sure what their real, like, the real motivating factor for wanting to do the science is but it doesn't seem like they're just having the time of their lives doing science.

Charlie: Yeah, no, they don't. They're not balanced.

Ryan: No, no, they're not. They would never, they would never do a podcast about drinking and science. Their podcast would be called science.

Charlie: To be fair, just because someone isn't you or me doesn't mean that they are doing things wrong but...

Ryan: ...probably the opposite...

Charlie: Yeah, we know that but I would say from my personal perspective...

Ryan: But that doesn't mean that I have to want to watch a movie...

Charlie: ... there are many, many ways to live a life. But, these, this way, I suspect, is stressful and perhaps, just to burn the candle that quickly like these kids are.

Ryan: Yeah.

Patrick: I was also going to say that just because you're portrayed a certain way in a documentary doesn't necessarily mean...

Charlie: Absolutely.

Patrick: ... that's the whole story either.

Charlie: I did have...

Ryan: Well, okay, I agree with that, obviously. But the, the documentary, I couldn't tell, I couldn't tell if the documentary was trying to make them look good or not.

Patrick: Yeah, I don't know.

Ryan: Because obviously it's lauding their intelligence and their efforts but at the same time, like, these kids are breaking down in tears because they got a 98 or a 99 on the test, because that, to them, is completely unacceptable.

Patrick: Right.

Ryan: Which, to me, goes a little bit against the grain of how scientists should treat, just, everyday life. I don't know.

25:05

Charlie: Yeah, there needs to be a little bit more, there needs to be a little bit more support and love and kindness in their life it seems like. I mean, I like how the document celebrates the kids intelligence, their fierce determination and just their general curiosity and zest for science but maybe these traits have been fostered to such an extreme that they're a bit monstrous. Like, there's something about them that's not quite human in the same way view a total religious zealot, you know, that just can't think in other modes of thought or in other frames. And that should be cured not celebrated.

Patrick: Alright, let's hear your rant Ryan.

Ryan: I, I was just, this actually just my cable bill. I don't have a rant. I just grabbed a piece of paper off my desk.

Charlie: Cable bill?

Ryan: Oh, yeah, now I've got to pay the bill so we can keep the internet up so I can keep doing the show.

Charlie: I need to start, to stop ordering shows at 3am.

Ryan: Yeah, I just, like, at the beginning, at the beginning I thought it was going to be this, at the beginning of the trailer, I thought it was going to be like this cool, *October Sky*, these kids are pulling themselves up by their bootstraps using science and by the end of it I was just like you guys are (bleep) nerds. And I just, yeah, like Charlie said, they just seem completely unbalanced in a way that I have a really hard time relating to or even having sympathy for.

Charlie: But I mean, they're so young. They have plenty of time to turn into something...

Ryan: But they don't think that way. They think that they are already behind.

Charlie: They just need, like, a good mentor and...

Patrick: They're still in high school, who knows...

Ryan: Alright, you guys were talking over each other a lot so both of you each say your statements again separately please.

Patrick: We agreed in the end. We got to the same place.

Ryan: Okay.

Charlie: I have hope for these kids. They're 17 years old and they're bright as all get out, so, I mean, if, with the right mentor I think they could be turned into fantastic scientists.

Ryan: And I hope so and yeah, I would, I just...

Patrick: Or podcasters.

Ryan: Or podcasters. No, we don't need the competition. Stay away kids. Listen, don't contribute. That's not true. That's not how I feel. This just seemed like *The Big Bang Theory* without any comedy. I don't know, I just...

Patrick: It might just be without a laugh track.

Ryan: It just depressed me.

Patrick: You have to see the comedy yourself.

Ryan: I just, I got depressed by this.

Patrick: Yeah, it was a little depressing. Alright, well, thumbs up, thumbs down?

Ryan: But they're all doing it for the right reasons, they're all trying to get out, I mean, it is the point, they are all trying to pull themselves by the bootstraps and get to a better place, get into a good school, get a good education and I wholeheartedly support that and I think that that is a noble endeavor because you can talk to a lot of different people and, who have tried other avenues of getting out of bad places that you may have grown up. And they'll all, I mean, I've never heard somebody say don't bother with an education. Everybody, everybody I've ever talked to said the education is what I should have been focusing on instead of trying to be a basketball star or a rock star or you know, a bank robber, I don't know.

Charlie: Yeah, and as far as making an irrational or poorly choiced, ah, emotional decision when you're 17 years old, I think breaking down in tears over a 98% is a much lesser evil then a lot of the other ails that 17-year-olds can find themselves in.

Ryan: Yeah.

Charlie: So these kids are all right.

Ryan: Yeah.

Charlie: The movie looks pretty boring, I'm gonna go down, thumbs down on it.

Ryan: Yes. Yeah thumbs down hard-core. Don't care, I went to science fairs as a youth and they, they were boring to be at. I don't know if I would want to watch one. Just kidding. I won the science fair one year so that was cool.

Charlie: We got like Sean Hannity, Sean Hannity on the air tonight.

Ryan: Sorry. Sorry. Sometimes you are...

Charlie: Science fairs, science fairs are awesome. Kids, go to science fairs.

Ryan: Sometimes you're the one with the vitriol Charlie, just tonight it's me.

Charlie: I've had my espresso, I'm feeling happy.

Ryan: I love science fairs, I went to the science fair as a kid, I won the science fair in the seventh grade with my project about parachutes and different numbers of parachutes affecting descent rate on a little pod.

Charlie: Wow, that's terrible terribly interesting, what's your vote Patrick?

Ryan: Charlie! Be nice.

Patrick: Thumbs down, and I didn't like the trailer either.

Ryan: I'm trying to commiserate with the science fair children, Charlie. Don't steal my project anyone I worked hard on that.

Charlie: Oh god. Speaking of, lofty ambitions and...

Ryan: We should talk about mountaineers.

Patrick: Enough West Virginia.

30:00

Ryan: All right we're not talking about.

Patrick: I've already heard about the science fair, we're moving into Greenland, or Iceland. Which is it Charlie?

Charlie: Greenland, we're moving on and moving up, just like Greenland.

Music

Ryan: Tell us what the problem is in Greenland Charlie.

Charlie: It's not necessarily a problem. So, Greenland as it's named does not suggest, is actually covered in ice. And Iceland is actually pretty green. But Greenland, so, it's covered in ice and this ice is a heavy, heavy blanket that pushes down on the rock underneath and as this ice melts the blanket is removed and so the rock actually rebounds upwards, or goes, moves up and so scientist have been studying this movement over the last two decades and Greenland is apparently rising out about an inch a year. It doesn't sound like very much but it's actually an accelerating rate and it's proof that ice is being lost from the continent, or the island of Greenland. And if ice is being lost that water has to go somewhere and it's going to go into the ocean, and so this is a direct cause of sea level rise which is a problem to all low laying cities worldwide. And so it's an interesting, further proof that sea levels are indeed rising and it's a pretty cool study. They placed GPS markers on places of Greenland that are not covered by ice, so, coastal areas on the rock and the various GPS detectors and they can measure precisely the vertical elevation of the surface and it is, like I said, moving up about an inch a year. The paper was published in *Nature Geoscience* if anybody wants to go check it out.

Patrick: So is it being, this ice being lost, more or less uniformly or is it, or is it being lost preferentially around the edge of the, or the southern part of the island, or how is this working, do you know?

Charlie: I don't know exactly but I'll guess that is's being lost from the edges just because those are the lowest regions and lower regions on the earth are warmer...

Patrick: Right.

Charlie: And so that's where the ice is going to be melting and the higher regions are where the ice is going to be deposited by precipitation and storm events.

Patrick: So I'm wondering if this is going to cause earthquakes and faulting where the outer, sort of, rim of Greenland rises up and the central part stays, more or less depressed.

Charlie: Yeah, that is an interesting question. I've talked to geophysicists at my department at UC Santa Cruz and they get excited about this sort of thing because as the crust rebounds after a load has been removed, and the load in this case is ice, the viscosity actually goes down as well. And so this causes frictional heating and so the crust actually becomes warmer and it may be more conducive to things like faulting and slipping. And so yeah it very well could cause earthquakes or, I don't know, over the long term, it could, it could create hotspots that would act as areas of hydrothermal flow or even vulcanism. Maybe not though, I don't know. But, what's surprising is that this response is accelerating so it means that the ice is melting quickly. I mean, they expect that some slight movement with each, with the seasons as ice piles on and then is removed and then piles on, but this is a continued trend over the last, last few decades.

Patrick: You might want to sell that beachfront property.

Charlie: Yeah, so I was thinking one of the Paleo WOW or the word of the week might be isostasy. And so isostasy is a natural balancing phenomena that the earth, or any surface, really, does when there is a density contrast and loads are either put on or removed.

35:04

And isostasy is not too dissimilar from just, a boat floating on the surface. The boat's going to sink until the density contrast is balanced and then the boat will float. And so, if you take off stuff, cargo, from the boat then the boat will sit higher in the water. And so ice is being removed from Greenland and it's going to sit a little higher on the earth's mantle.

Ryan: It's just interesting, I mean I feel like people have a hard time visualizing things on that scale.

Charlie: Yeah. Well that's, that's what's kind of cool about it to me.

Ryan: Is the scale?

Charlie: Yeah.

Ryan: Because people don't think about their continents as being floating.

Patrick: Well they're not floating in water.

Ryan: Well I just don't think that people think of their continents is floating on any kind of fluid.

Charlie: Well, now you know, it's floating on, floating on magma.

Patrick: Start thinking.

Charlie: Yeah, it's a rock floating on a rock.

Patrick: Yeah, it's a rock on a more ductile rock.

Ryan: A more different rock.

Patrick: A more different rock, same thing, but different.

Charlie: Yeah, it's a marble floating on clay, but not at all. It's something harder floating on something softer.

Patrick: Yeah.

Charlie: And they have different densities. So I guess I'll say one last thing about this study. Is that this is, scientists have long predicted that the ice will melt and sea levels will rise, and this is one of the clearest indications that this is actually happening. So there was a prediction made and now it's coming to fruition. And so

policymakers should take note of this because there will be consequences. And this is again just a number of hints that global warming is indeed happening, or at least climate change to some degree or another and, regardless of the cause it will have an impact and there's the proof.

Ryan: Yes.

Patrick: Right.

Ryan: So, cut it out climate change. Leave Greenland alone. Why don't you get back on top of Greenland ice. Climb that mountain.

Patrick: Whoa.

Ryan: What?

Patrick: That's a stretch.

Ryan: Oh. Yeah. OK, sorry.

Charlie: Speaking of plateaus.

Ryan: I was gonna say, if Greenland is rising, it's inhabitants might want need to get prepared, right Charlie?

Patrick: Yeah.

Charlie: Sure, get ready for high altitude.

Ryan: Yep, yep.

Music

Patrick: Tenzing Norgay

Ryan: Yes, Tenzing Norgay. Wait, who's Tenzing Norgay?

Patrick: Sir Edmund Hillary's Sherpa.

Ryan: Yes.

Charlie: Yeah. He didn't even need, he didn't need oxygen right?

Patrick: Right.

Charlie: He was like, whatever, I got this mountain.

Ryan: But why is that Charlie? Or should I tell you?

Charlie: Hemoglobin.

Ryan: You would think. But you'd would be wrong.

Charlie: Really?

Ryan: Check this out, a, new story out in *Science* from Tatum Simonson from the Institute of Human Genetics at Utah University of Medicine in Salt Lake City. Did a study on people from Tibet and people from Tibet are interesting because they have a lot of adaptations for living at high altitudes. And it's commonly said that the Tibetan highlands and the Tibetan plateau is one of the most extreme environments that humans habitually live in. Which, I've never been there, I don't know.

Patrick: Yeah, I haven't been either. But I know, we, as having friends who are geologists that's a common place for people to go do research and it's not uncommon to hear stories about people getting altitude sickness to the point where they have to come back home and cut their trip short.

40:00

Charlie: Right.

Ryan: Read *Into Thin Air* which scared me to death. But also made me want to climb mountains.

Charlie: Definitely

Ryan: It did both those things.

Charlie: *Three Cups of Tea* is also another great book about surviving the plateau.

Ryan: Yes. So they're all these problems when you get, when the atmospheric pressure gets that low and the oxygen level gets that low, but there are humans that live at these altitudes all the time and in a couple of different places around the world too. The Highlands in the Andes and also in Tibet but there are very different adaptations that humans the humans in those regions have employed to make living there possible. Which is kind of what the study is talking about. So some of the...

Patrick: And these are genetic adaptations not, not human creations.

Ryan: ...right, and that's what the study is saying is that these adaptations that we've known about for a while actually do have a genetic, a strong genetic component. Which may have seemed like a no brainer but it's one of those things that we don't know until we actually check. So here's some of the distinct physiological traits that Tibetans have. They have decreased arterial oxygen content.

Patrick: Which is opposite of what you would think.

Ryan: Right, you would think that they would have more oxygen but they don't. They have increased resting ventilation which seems to be in line with what you would think. They breathe at a higher rate. They have a lack of hypoxic pulmonary vasoconstriction which means their veins are just as wide as you would expect them to be even in a low oxygen environment. And they have a lower incidence of reduced birthweight which was not something I knew about. But they actually have a reduced hemoglobin concentration on average, Charlie.

Patrick: Which means their blood carries less oxygen.

Ryan: Right. And one of the ways...

Charlie: Crazy.

Ryan: ...one of the ways a person who is born at a low altitude and has to adjust to high altitude, does that, is their body actually increases the amount of hemoglobin to compensate...

Charlie: Right.

Ryan: ...for hypoxic conditions. So, it's very surprising...

Charlie: That's why climbers have to do things like climatize, like, spend three days at base camp, climb up to the next camp, and then climb back down and sleep at base camp again so they can grow more red blood cells and increase their hemoglobin capacity.

Ryan: Yup.

Charlie: Yeah, so that's surprising.

Patrick: So Tibetans don't do that. So instead of having more oxygen, they just use their oxygen more efficiently.

Charlie: Nice.

Patrick: So, their blood is not caring more oxygen, their bodies are just able to make better use of the oxygen they do have. Which, Ryan, is that different from then the people in the Andes?

Ryan: So, the study that, I read the paper and it says that the people in the Andean Highlands do it differently but it doesn't say how. It just says what the Tibetans do. So, I'm honestly not sure. I, I knew someone who was born in the Andean highlands and, so she, so one of the, one of the things also is if you are born at a high altitude you tend to just get some of these adaptations automatically. Like, higher hemoglobin. And she said she had a higher hemoglobin count and things like that. I'm not sure how well versed she was in her own physiology but that was her claim and it seemed reasonable at the time and I hadn't read the study yet.

Patrick: So the option upshot is, we don't know. So if you are, so anyway, for sure, if you're not born at higher altitudes your body adjusts in different ways than Tibetans. So you are increasing your hemoglobin to deal with it and Tibetans naturally have low amounts of hemoglobin and they are just using their oxygen differently, more or less.

Ryan: And it's one of those cool cases where, Patrick the other week, we talked about separated human populations and you mentioned that the people in the Australian outback have been a distinct population for over 10,000 years but we don't see that many differences in them. And here is a instance where we know that the people have been living in the Tibetan plateau for the last 7 to 5000 years but it's also possible that they've been there for as long as 21,000 years. So we're actually seeing, I mean you could say, they were actually seeing evolution on these time skills in this population.

Patrick: Yeah, not to the point where, you know breathing is inhibited with an outside population.

Ryan: No, but they are adapted uniquely to their environment.

Patrick: Right, right.

Charlie: That's pretty cool.

Patrick: Yeah, it's definitely pretty interesting.

Ryan: Yeah.

Charlie: So do you guys know how they use the oxygen more efficiently. It sounds like they just, I mean, they're making more with less or something, somehow. Do you guys understand the physiology behind that?

Ryan: This paper didn't really go into it. It says, it says they maintain a normal aerobic metabolism despite profound arterial hypoxia and they think that there might actually be differences in the oxygen transport system such as elevated levels of nitric oxide and vasodilation of blood flow.

45:03

Charlie: Yeah I was thinking it might be something like vasodilation where they're just are much more efficient.

Ryan: They also just...

Charlie: Just like, I mean athletes are much more efficient, make much more efficient use with their oxygen and blood.

Ryan: I mean the other thing is they just breathe more, they just take more breaths in a given amount of time. So, it would be interesting to do a study on trying to get these guys to hyperventilate at high-altitude by breathing even faster. Or, to see if us breathing at their rate would cause hyperventilation.

Patrick: Do they have problems when they come down from altitude.

Ryan: I've never, I think, I don't think so. I've never heard of any of them having problems coming lower. The problems you get going higher are pretty severe. Like, there's, HAPE and HACE which are high-altitude pulmonary versus cerebral is the difference...

Charlie: Right.

Ryan: Edema's. Where basically the pressures, the atmospheric pressure gets so low that the pressure differential inside, if it's a pulmonary edema, the pressure lungs differential inside your lungs, which is required to push the gas into the capillaries in bronchia of the lungs, if those pressure gradients get too shifted where the atmospheric pressure isn't enough to push the air in, blood starts seeping out of your capillaries in your lungs and you start...

Patrick: Right and you get fluid in your lungs.

Charlie: Drown...

Ryan: Yeah, you basically drown on your own blood unless you're taken to a lower altitude immediately.

Patrick: We call a curse...

Charlie: Curse

Ryan: A what?

Charlie and Patrick: Curse.

Ryan: Well it's funny is, the one way they have come up with dealing with this is by, they basically have this inflatable bag that you climb inside and it's sealed and they pump it full of air so they try to increase the air pressure inside this bag and then this drag down the mountain inside this bag. But the bag is basically a coffin and at that point. You're just getting in the coffin early. And sherpas refuse to use them because if a sherpa ever admits to having any of these kinds of problems he basically can't get work anymore. It's really weird. I mean the culture, the sherpa culture is fascinating with the machismo of this mountain climbing lifestyle. I think it's pretty cool.

Charlie: Cool.

Ryan: Another group of people that have a lot of machismo and feminismo, is that a word, does that work, is there such a thing? As feminismo?

Patrick: I don't know, I mean macho, does that really mean man?

Ryan: I think so, at least, I've never heard, I've never heard of I never heard any woman referred to as as having machismo.

Patrick: No, but I have, I'm wondering if feminine is the opposite of macho.

Ryan: I don't know, what do you think Charlie?

Charlie: How about we just say courage?

Ryan: The courage to interact with the Paleo Pals.

Patrick: Yeah, it takes a lot of courage to get in contact with us.

Ryan: I know, right? It's so difficult, we don't make it easy.

Charlie: Gumption?

Patrick: Gumption. Can-do spirit.

Ryan: Brass balls. No that's still male.

Charlie: Yeah.

Ryan: Well, Paleo POW is next.

Music

Ryan: Oh, so we have a bit of an announcement this week and that is that we are going to try and start a blog. It seem like there was a bit of interest in it when the idea was kicked around the Facebook page and we're hoping that people will be willing to go check it out. But if you are sick just listening to the three of us and occasionally Ben, we decided to bring in a ringer and that ringer is Jacob Stump, an old buddy of mine who was invaluable in helping me figure out my *Iron Man* articles. And say hello to everyone Jacob.

Jacob: Hey everybody.

Ryan: And so Jacob why don't you tell us, or tell the Paleo Posse, kinda what you're going to be bringing to the blog and why they should come check out your articles every week.

Jacob: Cool, yeah well, I graduated from Embry-Riddle Aeronautical University in 2008 with a degree in aerospace engineering, that's where my expertise lies, pretty much in all things that have to do with airplanes, aircraft, spacecraft and the engineering aspect of it more so than the science aspect of it I guess. So, I'm planning on bringing in some articles having to do with flight and jet engines and some of the science behind that, hoping to make it a little interesting for everybody. So, yeah, you know, we'll see how it goes.

Ryan: Cool. Do you want to give people a sneak preview of what your first article's going to be about?

Jacob: Sure, yeah, so the first article is going to be about stealth technology and ah...

50:02

Ryan: How will people find it? Ha, ha, ha! Bazinga!

Jacob: I'm guessing it's going to be on ScienceSortOf.com.

Ryan: Well that's not entirely accurate. So, well, go ahead and finish telling me about the stealth article and then will tell people where they can find it.

Jacob: Sure, well, I'm basically going to be talking about the different kinds of stealth. Everybody, I'm sure, is familiar with the two big stealth aircraft that come to mind when people think of stealth, the F-117 stealth fighter and the B2 stealth bomber. And those two aircraft use really the same concept of stealth technology even though they look totally different. And that might not be readily apparent to most people, but, hopefully I'll make it apparent in the article.

Patrick: Well, I mean you are writing about quasi-secret technology here, so I think we've got to keep some of the mystery.

Jacob: That's what I'm thinking.

Ryan: And Patrick, you've been spearheading the design so why don't you tell people where they can go to find the stealthy, stealthily written article.

Patrick: Well, the, our first plan was just to just incorporate the blog and, sort of, the show notes part and podcast side of things all on Sciencesortof.com. But we decided to keep things a little cleaner and to keep the blog posts a little easier to navigate through, we are going to move the blog to a sub domain. So you can find all of our blog postings at Paleocave.sciencesortof.com.

Ryan: We referred to the Paleo Cave before as our lair where we concoct our, our plans and now it exists.

Patrick: That's right. So, we'll be scrawling on the walls and trying to keep the Brachiolope at bay.

Jacob: Are there any UFO drawings in the paleo cave?

Ryan: Not yet, but that's, ah...

Jacob: There should be.

Ryan: ...well you're the one talking about stealth aircraft. Maybe after your article goes up people will be spotting from the images in your article what they think are UFOs and scrawling them on the walls.

Jacob: Definitely.

Patrick: I like that idea though. I like the flying saucer on the wall of the cave.

Ryan: Yes, yes. Maybe Nessie jumping out of the loch to bite it.

Patrick: Maybe.

Charlie: We do have several Sasquatch foot casts, so.

Ryan: Yes, yes. But those are on the floor of the Paleo Cave. You can't see that because you're looking at the wall when you go to the blog. It's fully interactive, three dimensional except you can only see one or two of those dimensions. Awesome, well Jacob we are thrilled to have you on board and I think, I know I'm personally looking forward to reading your articles every week and hopefully everyone else is too, so, yeah. Welcome aboard Jacob.

Jacob: Thanks, I really appreciate the opportunity.

Patrick: We appreciate you writing for us.

Ryan: Yeah.

Charlie: Yeah, I think it's an awesome maiden post so congrats.

Ryan: It'll be fully comment enabled so whether you love it or hate it, you can tell Jacob right to his, right to his stealthy face.

Jacob: Yeah, and hopefully I'll be able to throw in some cool, you know, industry anecdotes in there and things that you might not get out of a textbook. But, that the old engineers have told me at work, so, I don't know, we'll see. I've got more than enough stories, I think, to fill, you know, a year's worth of blog posts. Most of them I don't believe are actually true, but...

Patrick: They all involve area 51.

Charlie: Oh yeah, I know a couple, I know a couple guys that worked on the development of the B-2 and they tell me about the buildings they work in, worked in with no windows and they couldn't really tell their family what they were working on and they were working in the middle of the desert.

Patrick: That sounds like grad school.

Jacob: Oh yes.

Ryan: All right Jacob well we will let you get to sleep so you can make it to your secret site in the morning on time. And yeah, thanks for coming on and introducing yourself.

Jacob: Hopefully I can come on again.

Ryan: Yeah, we'll have to have you back on again.

Jacob: No problem. Have a good night, guys.

Patrick: Thanks a lot Jacob, goodbye.

Ryan: Yeah, so I said the Paleo POW's are next so let's talk Paleo POW which is our segment that we do each week to highlight the various ways that the listeners are interacting with the show. Who would like to go first?

Patrick: I can go first. So my Paleo POW this week highlights a relatively new section of the webpage which is the Brachiolope gallery. And you can get there either by going to ScienceSortOf.com and clicking on the Brachiolope gallery on the left-hand side of the page or by going to ScienceSortOf.com/brachiolope-gallery. And in that section of the webpage you'll see various pictures that people have drawn that show the Brachiolope in various situations, life stages, etc. and after Ryan put up several pictures, John Lopez wrote in, who is a friend of the show, and also hosts the nerd list, is that right Ryan?

Ryan: Yes.

55:00

Patrick: John Lopez wrote, and he said, "I made you guys a new Brachiolope pic" and he linked to it. And it's, ah, it's a very iconic, picture of a, of a sun, of a really red sunset and silhouetted in that sunset is the Brachiolope in all of its glory and splendor.

Ryan: I love that one.

Patrick: And the next comment on the page was by scubabone and who said "I love the smell of Brachiolopes at sunset."

Ryan: Scubabone is an old friend of mine so thank you, thank you David.

Charlie: This gallery is amazing.

Ryan: I know there is so much good stuff.

Charlie: It's pretty awesome.

Ryan: And we want more, right Patrick?

Patrick: Yeah definitely, so if you've created a Brachiolope or as Ryan puts it, if you spotted one in the wilds of the internets, please let us know about it, email us or leave a comment on the Brachiolope page.

Ryan: And we'll put it in the slideshow and we'll link back to wherever your home on the Internet is So people can find your stuff.

Charlie: Very cool.

Ryan: Oh Brachiolope, such a majestic, misunderstood creature.

Patrick: Definitely.

Ryan: Well Charlie what are you bringing to the, the Paleo POW this week?

Charlie: Well, like the Brachiolope I'm talking about individuals that walk the earth with pride and these are people who have become scientists and they have a story to tell about why they became a scientist, something that we're always interested in on the show. And this letter comes from Cindy and she writes "Hi guys, It seems to me that I've always been interested in science. When I was young I was inspired by reading Madame Curie's biography. I used to have dreams where I was looking through a microscope. Now I've been a medical technologist and I use a microscope every single day and I do this, I have done this for many years and I still love it. Thanks for the great podcast. Peace." – Cindy.

Ryan: Awesome. Well, it's true we do love, we do love to hear why people became scientists.

Patrick: Yes we do. Or even if just why they like science, if they are not a scientist. If you happen to be a, I don't know, what's a, definitely not, if you happen to be a baker and you still like science, let us know why.

Brian: Baking is chemistry.

Patrick: It is a chemistry.

Ryan: It's tough chemistry, it's chemistry early in the morning, I would not...

Patrick: Well you can...

Ryan: I could never be a baker.

Patrick: You can relate science to just about everything, everything you do that produces something, so.

Charlie: I liked how Cindy mentioned a scientist that inspired her. I mean when we talked about our inspiration on the show, we seem to mention scientists too so I think that's a cool take. I always like to hear which scientist inspired people.

Ryan: Like Dr. Ian Malcolm.

Charlie: Yeah. Who is that?

Ryan: That's like, I can't, that's like who I think of you as, Charlie, he is, *Jurassic Park*.

Patrick: He's the mathematician.

Ryan: He is the mathematician from *Jurassic Park*.

Charlie: Oh yeah, that guy was pretty crazy.

Ryan: You're kind of, I kind of see you like Dr. Ian Malcolm though, you are the, the rogue, like, plays by his own rules, leather jacket wearing, smooth talking mathematician physicist type of person.

Charlie: Black hair, move my hands...

Ryan: You do. Yeah.

Charlie: Frenetic... I'll take that as a complement.

Ryan: Yeah, it's intended as a complement.

Patrick: My advice to you would be do not attempt to turn yourself into a fly.

Ryan: I knew you were going there with that Patrick.

Charlie: Or do not tempt a T-Rex with a torch.

Patrick: Yes.

Charlie: I mean, it was very effective, it did work.

Patrick: Yeah, only the lawyer got hurt in the end.

Ryan: I'm trying to think of which movie or television scientist Patrick reminds me of now that we're on the topic. Hmmmmm. Got anything Charlie?

Charlie: I'll have to think about that for a while. He's definitely a levelheaded, stoic individual that survives to the end.

Ryan: Survives till the end.

Patrick: All right well while you were thinking why don't you read us your Paleo POW Ryan?

Ryan: Maybe you're Reed Richards, he was a scientist.

Patrick: Reed Richards?

Ryan: Yeah.

Patrick: Who is that?

Ryan: Mr. Fantastic of the *Fantastic Four*.

Patrick: Yeah.

Ryan: Maybe not.

Charlie: I can't say yes or no, I don't really know.

Ryan: I always wondered I mean, the thing that I was confused me about Reed Richards is he's obviously got a doctorate but he called himself Mr. Fantastic. Which, if you're calling yourself fantastic anything, it's already a pretty presumptuous and proud name to give yourself, why would you not include your, why is he not Dr. Fantastic? He's fighting Dr. Doom, You would think he would emphasize that they have the same level of education, that's all I'm saying. This has been bugging me for a while. I'm glad I finally have a platform.

Patrick: I have no answers for you.

Ryan: Okay. My Paleo POW this week comes from Grain Sheeran and I hope I'm pronouncing that right.

1:00:04

Who, said, who saw, saw something online and sent it our way. It's kind of weird and I haven't shown the other guys yet so I'm going to link through to it now. It's, it's called the Starkenberger Beer Resort. So, it's a place in Austria where you go and you sit in giant tubs of beer, with other men, together.

Charlie: With each other.

Ryan: With each other, as men, in beer.

Charlie: Yeah.

Ryan: This please scares the hell out of me.

Patrick: It's pretty awesome.

Ryan: So each of the pools of warm beer contains up to 42,000 pints where one can sit and bathe and relax fully immersed in beer.

Charlie: 42,000 pints, how many men?

Ryan: How many men is that? As many as you want Charlie. Seven 13 foot pools of warm beer.

Patrick: I bet that smells great.

Charlie: Yeah, this is...

Ryan: It's in Fernpass Starkenberger Austria.

Charlie: Remind me to check, not put that on my list...

Ryan: Yeah, it's not on your bucket list. I wonder what kind of beer it is, like what's the best of beer to bathe in?

Charlie: Helps cure open wounds it says.

Patrick: The only thing better than having 13 guys in a pool of beer is having 13 guys with open wounds in a pool a beer.

Ryan: Well it says it helps cure open wounds and psoriasis which is...

Charlie: Yeah they say psoriasis, how does a cure psoriasis?

Ryan: Well not only how does it cure psoriasis, but you're sitting in a pool of beer with another naked dude with open wounds and skin rashes. It sounds terrible. Guess how much it costs.

Charlie: You couldn't pay me enough.

Ryan: Well okay, guess how much they charge.

Patrick: €22.

Ryan: For what? What do you get for €22? Unlimited beer swimming?

Patrick: 30 minutes in the beer pool.

Ryan: Charlie? What are your thoughts?

Charlie: How often do they change the beer?

Ryan: I'm asking, what are your thoughts on how much does it cost versus how long you get to spend in there?

Charlie: It depends on how often they change the beer. If you've got some stanky psoriastitc beer in there I bet you it's cheap but if you get your fresh 42,000 pints for you and your cronies then, I don't know, I'm going to say €100 an hour.

Ryan: All right, all right, well Charlie was much, much, much, closer. It's two hours of swimming in a heated and unique beer pool is €135 per beer pool.

Charlie: Unique means fresh, or unique means novel and...

Ryan: It does not, this is, this is translated...

Charlie: ... big capital WTF unique.

Ryan: This is translated from German, there's four people per beer pool and a beer pools are 4 x 4 meters big. You can choose your own bathing temperature Charlie, so that's what was holding you back, if you thought to yourself I'm not getting into a beer pool unless I can control the temperature knob, don't worry, that is covered. Now, you can get the beer pool plus package which is getting two hours in the I beer pool with some crackers and a meat spread.

Charlie: I think there is enough meat in the pool already.

Ryan: You get a bottle of genuine Starkenburger beer which I'm guessing is the beer they are filling the tank, these tanks with too. Do they bottle this beer afterwards and serve it.

Patrick: Hopefully before.

Ryan: Yeah. And so that's, that's €135 for beer pool, and an extra €4 per person to get your crackers and your bottle of beer.

Patrick: Well it sounds like a deal.

Ryan: No it doesn't, well I mean, yeah.

Patrick: For an extra, if I'm already paying that, for an extra €4...

Ryan: Yeah, definitely go for the, definitely go for the plus.

Patrick: Definitely go for the plus.

Charlie: Yeah.

Ryan: Oh God it just sounds terrible. Bierschwimmbad. I'm guessing the schwimm is the pool part. Bierschwimmbad.

Charlie: Let me see this.

Ryan: So that's my Paleo POW.

Patrick: Nice. Well if you find something wild and crazy on the Internet that you think we would enjoy seeing...

Ryan: It's good.

Patrick: Then you can send it our way via the email Paleopals@sciencesortof.com. Ah, you can also get in touch with us individually if you don't want all of the Paleo Pals to see your message. And you can do that by sending an email to each of our names at sciencesortof.com like patrick@sciencesortof.com.

Ryan: ryan@sciencesortof.com.

Charlie: Charlie@sciencesortof.com who just realized I've been less than 20 miles from this place.

1:05:04

Ryan: Really?

Charlie: Yeah, because I've been to Ensbrook.

Ryan: Oh wow, that's crazy, you couldn't smell it a mere 20 miles away?

Charlie: I thought it was just the guy on the train but now I know otherwise.

Ryan: Ah, that's funny. Yeah, there are tons of other ways to interact with us though. We've got a Facebook page which if you just search for sciencesortof.com you can find and that's a lot of fun and we interact a lot and people have been posting stories on there. We haven't necessarily been using them but that doesn't mean that we're not checking them out and seeing them so continue to do that. We're still accepting questions for the quiz show, quizmaster@sciencesortof.com or call the voicemail line and leave us a message. We got a message recently. I haven't looked at it yet because I saw that it said this is a question.

Charlie: Cool.

Ryan: The voicemail line can be reached by calling 312 Paleo Pals which is also 3127253672 and check this out, I also set us up a Form Spring account.

Patrick: Which I had never heard of before you set it up but I saw there's been some action on there.

Ryan: There has been, there has been, Yep. So please, you guys avoid that and I will take care of it. But, but yeah that's at...

Patrick: Well that calms my nerves.

Ryan: Don't worry Patrick I got it. I got this.

Patrick Let me do this.

Ryan: I'll do this, I swear. So that's at formspring.me/sciencesortof. Ask us a question there and you can do it anonymously or not anomalously, which ever. You don't need an account or anything, you just ask. And we havenot answered any of those questions yet because it's coming up on the quiz show. Charlie, your Twitter follower count of the week, are you ready?

Charlie: Yeah.

Ryan: What was it last week, do you remember?

Charlie: 26.

Ryan: You have 27

Charlie: Nice.

Patrick: Yeah.

Charlie: At this rate I won't have to go on Twitter for six months.

Ryan: So the deal is Charlie sends out his first tweet when he gets 50 followers. So if you want to see what Charles has to tweet go and follow him at twitter.com/charlesbarnhart but there's also some twitter.com/Sciencesortof, twitter.com/pvwheatley, and twitter.com/haupt.

Charlie: Man if it goes down I'm gonna get really depressed so if you're currently subscribed do not unsubscribe.

Ryan: It's not like it's wasting any of your time to be subscribed.

Patrick: If all 27 of you were just to open a separate Twitter account and then follow Charlie we'd have it done.

Ryan: Yeah. Yeah Twitter followers, I'm not going to do that though.

Patrick: Yeah I'm not going to either.

Ryan: Okay, well that brings us to, well 20 something minus us two is 25 so.

Patrick: That's perfect.

Ryan: The rest of you get on it. All right, well I think that wraps it up for another week. Do you guys have anything left to say to the Paleo Posse? Or have you said quite enough?

Patrick: You're in this far don't give up now.

Ryan: In this far?

Patrick: The Paleo Posse.

Charlie: Yup.

Ryan: You mean they should keep listening?

Patrick: Exactly.

Ryan: To the end of the show? Or to the next show we put out?

Patrick: To the rest of the shows that we put out.

Ryan: Tell your friends, sit around the radio and listen.

Patrick: The radio.

Charlie: Tune in.

Ryan: On our frequency of science with frequent science updates. So there's this episode 37, What was our theme I don't even remember?

Charlie: The Highground.

Patrick: The Highground.

Ryan: Oh yeah, which I, I, didn't get a chance to mention, So in Star Wars Episode 3, you know the last of the bad times, one of my favorite lines is when Obi-Wan standing there with his hands on his hips is looking at Aniken and goes "you can't win Aniken, I have the highground". So that's what I think of whenever I hear the highground. It seems like a very strategically advantageous place to be.

Charlie: It is.

Ryan: And that's where you've all been so thanks for coming along, thanks for coming up to the Highground with us. Hopefully you're not experiencing a high altitude pulmonary adema, We would feel bad. Be sure to join us next week for episode 38 where we will be giving you loads more science...

Patrick: Sort of.

Charlie: It works.

Ryan: You just weren't going to play along this week Charlie? With the sort of?

Charlie: No, I was just thinking science works in general.

Ryan: Oh okay, yeah.

Charlie: It works all the time.

Ryan: All the time. There's no sort of about it?

Patrick: That's mellow yellow you're thinking of.

Charlie: It's self correcting.

Ryan: No if's, ends or butts. Sometimes it's wrong and that's OK.

Charlie: We learn.

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](https://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

Patrick: There's like a bajillion things happening here.

Ryan: Wait, what do you, what? What are you complaining about?

Charlie: All of the texting and bubble noises.

Ryan: Oh that's why I disable all my noises.

Patrick: Jesus Christ.

Ryan: Sorry, we're distracting Patrick with Skype.

Patrick: Well, like, my icons are jumping around, There's like, bleep, bleep, bleep and then finally there was like, this message that popped up in front of everything on my screen.

Ryan: Oh really? I didn't do that.

Patrick: Um...

Transcriptions provided by Denny Henke of Beardyguycreative.com