Your Questions Answered - Bret and Heather 88th DarkHorse Po...

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**SPEAKERS**

Bret, Heather

**Bret** 00:09

Hey folks, welcome back to the Dark Horse podcast live stream q&a number 88. We are here streaming on both YouTube and Odyssey. And we are going to answer your questions with our brand new question accumulation program specially designed for Dark Horse.

**Heather** 00:33

That's right, once again, that's dark horse submissions.com. That's where you'll find it. You know, when we first started doing these live streams in March of 2020, we because it was, it was during the school year and our producer was the then then 15 year old, Zachary Weinstein, our son, I know it seems like it can't be right. But it must be because it was just before his 16th birthday. And he's now 17. We did them, even though he was in virtual school at that point, but we had to do them after school was over. And so we always start at 330. And these last couple of times, we've started at three just seem completely exhausting, because you've just you've had a day before you do this. So we're a little a little punchy. Like we were, I think last week for the questions. I mean, it's also been a hard week. Yeah, because of my staff. So we're going to do our best here. All right, yeah. So we're going to start with a question from the discord server this week, every week. People on discord get together and decide on what question they most want to ask. And we start there and the

**Bret** 01:37

most discordant question. I don't know if

**Heather** 01:39

it's like that. I don't know. We'll see. Discord.

**Bret** 01:43

discord de

**Heather** 01:49

terrestre terrestrial vertebrates? Yes. That's the question. No, terrestrial vertebrates are all tetrapods for login, but terrestrial invertebrates can have six 810 or more. What is it about having an internal skeleton that limited ancestral terrestrial vertebrates, vertebrates to evolving only four lambs? So that's, I love this question. And I, I have sort of a kind of a mechanistic answer. And I'm not, I feel like I would like to spend a week or so talking with people about this, rather than trying to do something kind of, kind of off the top of my head. What What are you looking at? Well,

**Bret** 02:27

I'm trying I'm thinking back through the phylogeny and trying to figure out how much we're going to foist off on to historical constraint and how much we've got a mechanistic reason there. They look like they're they sound like they're looking for a mechanistic explanation. I'm just trying to

**Heather** 02:42

Well, one one of the levels of mechanism has to do with hOx genes. Yep. So this is this big class of genes called homeobox genes within which is a category of genes called hOx genes sometimes those are conflated actually often they're complete In fact I found a paper by to be a well respected biologists today in which they you know often say like hawks parentheses homeobox or the universe but now like hawks is a subset of homeobox and hOx genes specifically, are involved in basically repeating segments on the anterior posterior axis and so in invertebrates you basically have an axial skeleton access sort of three skeletons developmentally you got an axial skeleton, a cranial skeleton, and then an app and ticular skeleton the the pendency is and exactly as the discord people are are positing we've got two girdles, we've got two appendicular girdles the pectoral girdle up here off which come our arms and the pelvic girdle off which come our legs. And that's actually highly conserved across all all vertebrates there are no when you get repeats when you get repeats that don't belong in the hOx genes invertebrates at the you know, sort of perpendicular girdle level those those hopeful monsters don't survive, right they aren't they aren't that hopeful. But there it does seem to me that there's something about the the the more repeats that are already in the arthropod skeleton, I don't know if it's going to be an internal versus external skeleton thing per se. But the fact that there are just already more repeats, and so the sort of, you know, at each at each of the segments, often arthropod skeleton, you can kind of do a repeat that involves legs, or, or not. And so there I sort of fizzled out without having spent a lot more time digging back into the EVO Devo stuff that I once kind of knew, but also I think we don't fully understand you know, like the anterior posterior axis hOx genes deal with repeats But you know what, more than that?

**Bret** 05:02

Yeah. I have to say I don't have a good fix on this there is something about the arthropods with their many segments that there are bound to be simple rules for animating those segments. Yeah, there were simple patterns. And in fact, those of us who have experimented with robot building, find that you can, you know, you can create an insect or a spider, and that, you know, it's not so hard to figure out a pattern that actually produces locomotion. And there's something about the fact of the vertebrates being more software flexible. So the pattern that function is to produce locomotion is something that can be partially acquired. Now obviously a horse locomotives pretty well at birth. A person does not. So how much flexibility there needs to be. Here's a question, but I'm wondering about

**Heather** 06:04

so you're, you're talking about it's like a conservation of flexibility, like if invertebrates which tend to have more software control, there might be less flexibility in the hardware side, it's a lot of the hOx genes,

**Bret** 06:21

it's a lot easier to produce a vertebrate that cannot figure out how to walk rather than I'm thinking by analogy. I think I pointed some weeks ago to Vi Hart's analysis of Fibonacci sequences, plants and the basic point was nowhere in the plants is there a description of the Fibonacci sequence what there is, is a set of simple rules that results in Fibonacci sequences that basically serve to get the leaves out of each other's shadow so as you change the form of a plant, you get a slight modification of where the leaves come out, but basically they're repelled they are chemically repelled from the last bit from all the other leaves in such a way that distributes them so that they fill in whatever structure you've gotten. So the basic point is, you've got a system that as you change the structure of a plant, distributes the leaves in some useful way and I'm imagining that there might be something similar where as you add legs, there's some mechanism for figuring out how to coordinate them and that this would be much harder to do in vertebrates therefore a conservation where the way to locomote is a variation on a known theme Yeah, rather than rapidly expanding comment or x problem Yeah, might might be the

**Heather** 07:41

well there's also it's it's very rare invertebrates to be able to regenerate limbs or digits it is it exists in some in I think a couple of different salamander clades SPECT had yes we for sure one salamander clay but I think it's actually more than one salamander clade so actually multiple I think the evidence suggests the one I'm recalling correctly Well, I think there may be multiple evolutions of this capacity, but it is it is restricted to I think, caught aids to salamanders within at least within the tetrapods, and I think maybe within the vertebrates more broadly, whereas everything about arthropods seems sort of more segmented like you know, you everyone has seen like harvest men, which aren't spiders, but are related to spiders and Daddy Long Legs, having lost a leg and still moving around, find sometimes us three, four or five legs even right then they still do fine. They don't you know, there's no need to stop the bleeding. They just like it happens. And vertebrates don't do nearly as good a job of sealing off things when they lose when they do something. Well,

**Bret** 08:46

there's a question about where this comes from, though, because so we have noticed many times in the tropics, when you're when you're at a field station that has some sort of lights that stay on all night, they act as an inadvertent light trap. And so especially if you lodge somewhere where you pass the same wall every night, you get a kind of a sense of who's coming out of the forest. And it's amazing how frequently, you encounter animals that are missing a limb and still functioning,

**Heather** 09:15

but it's all insects and arachnids, right?

**Bret** 09:18

But the point is, alright, these are creatures that don't have meaningful capacity for repair at all right? And so there's a question, what is selection? See, when you know, a spider has lost a limb, right? It has no process by which to give up and fairly frequently, a spider who has lost a limb and manages will reproduce, so but

**Heather** 09:41

that could maybe its capacity for repair. That is the sort of causal agent that we're looking for rather than external versus internal skeleton.

**Bret** 09:47

That's exactly where I was going, Oh, my point is going to be in the vertebrates. We see the repair capacity, tracking the viability of the creature in repair and Post repair. So we see it, I think we've mentioned this recently, we see it in things like sloths, which fall out of trees and break a limb. And because they're not just a tree limb, right, they, because their ecology does not depend on them dodging predators, through stealth, or through speed, you can actually get away with being a sloth with a bum limb, and survived your crypsis, which is the basic way that they avoid being eaten. So the point is, there have been lots and losses lots that have broken a limb, and then gone on to reproduce. So there's lots of capacity to repair a monkey similarly and us, right, we have lots of capacity for that kind of repair, but loss of limb, how often. And so the point is, why is this capacity not augmented the capacity to replace a limb, I see one of two paths one limb loss is so devastating that you don't tend to survive it and leave offspring in the ancestral environment. And the other, which leans more in the direction of my initial response here is that we have to learn to use our limbs. And so if you replace the limb, it's not automatically clear that it would be so useful just the same way as a blind person has been blind since birth, who suddenly gets sight doesn't necessarily know what to do with the information that there's that's coming in their eyes because they didn't go through the developmental process that would teach them how to deal with it. So, you know, is the reason that we can't regenerate our limbs because it's biologically impossible to create that or is it that it just has not been useful so in the same way that a horse doesn't have the capacity to repair a broken leg very easily because very few horses in the ancestral past ever survived a broken leg because they would get picked off by whatever predators are present. You just never got augmented.

**Heather** 11:54

Yeah, and I guess so not appendicular skeleton but returning to axial skeleton. limb regeneration is very rare in let's just stick to tetrapods because I'm just less sure about the aquatic vertebrates, the primarily aquatic invertebrates, ones that didn't return secondarily. But along the axial skeleton caudal autonomy, which is fancy language for tail loss and regrowth is actually fairly common in the, in the squadmates. Right, which is the lizards and snakes were and in fact, they're, they're definitely in this case, different evolutions of coddle autonomy because in some cases, its interpretive role. In some cases, the when predator bites the tail, it's adaptively advantageous to drop the tail and they leave, leave the tail moving while you escape and the predators to come alpha tail. Sometimes that break happens between the vertebrae interpret your belly, and sometimes it's introverted, really, sometimes it's actually it breaks a vertebra in half. Yep, really. So clearly different, different evolutions of caudal autonomy, which, if you're if you're a yummy little lizard, or a snake, there are there are apparently many clades in which that was an adaptive. Alright, thank you.

**Bret** 13:11

My ignorance is about to come to the surface here. I would have said that there are no snakes that have Cottle Academy you tell him if there are any

**Heather** 13:17

Yeah, as I was saying, I was like I think they're I think there's I'm not I'm not positive in and why so I have this. I have a sense of like, why there might not be you probably have a sense of why there might are you just saying, I've never seen it? Yeah. My sense is locomotory why's it you know, loss of a tail? is a big deal. No matter who you are, if you had a tail. Yeah. But for a snake. It's an even bigger deal, because you're using you know, depending there's like these five modes of locomotion and snakes. But regardless, you're using your body on the ground to some degree and your tails part of that body on the ground. Yeah, lose your tail. And you may actually be be really incapable of getting around for a while after that.

**Bret** 13:59

Yeah, well, you could crumble. I mean, I don't see any reason that it shouldn't work. But I think the reason I guess I'm not expecting it is the way snakes are preyed upon may not make it all that useful. Right. In other words, if you're jumping at a lizard and the lizard is escaping, it's not uncommon that you end up with its tail. Yeah, drops the tail and I'm thinking that might not be the case with snakes that the way a predator goes after a snake.

**Heather** 14:34

A very quick search reveals the Russian Journal of herpetology from 1994 coddle autonomy in the colubrid snake xeno crawfish, Pisco, Tater. Now pice Gator from Vietnam. The abstract, which is not extensive, a rare case of Karla tautomeric colubrid snake from Vietnam as described it is an intervertebral autonomy that differs from the more commonly encountered in Traverse kubrat autonomy typical of most lizard species distribution and origin of interpretable autonomy in squadmates are discussed. So does

**Bret** 15:06

it say anything there about some predator that would then validate the trickier part of a hypothesis I just put forward?

**Heather** 15:15

Yeah, I do not have the rights to the full paper at the Russian journal, herpetology, I'll have to, you know, try to sign up this later or something. So all I'll have these abstract in the references, all you have

**Bret** 15:27

is the abstract which, which is like two sentences long as you rushing to conclusions, which in the scientific paper are upfront. In the abstract? They are Yes, Russian. Yep. Joe included. Right there. Got it. Got it. Not overwhelmed with the humor? No. igraph week? Yeah, yeah.

**Heather** 15:52

Question one from this week. I've been a liberal my whole life. My father now thinks I'm a right wing nut job and is unwilling to even listen to your podcast. There's obviously a lot of information he hasn't been exposed to. How do I help him in the right way? This has been a process for me, and has changed my life.

**Bret** 16:10

Yeah, that's a good one. And the most important part of it has to do with the family aspect. I think a lot of us are finding this. I know that I am finding it even pretty close in within our not family so much, but friend group where people that you would imagine should see at least the confusion of where we are and should understand that somebody arriving at a conclusion that sounds like it's from the other side isn't on the other side. They've just followed the evidence somewhere. I think the thing that I would start with is the evidence that nobody really knows what's going on is pretty profound. And I would point to the following thing. People are sick with a lot of different things, right? Whether it's obesity, or autism or anxiety disorders, right, the number of maladies that afflict human beings is many, and lots of people are willing to tell you that x malady is not caused by y influence. What they're not willing to do is tell you what it is caused by the basic point is nobody wants to address the sheer number of places where we have apparently done something wrong enough to harm 1000s hundreds of 1000s sometimes millions of people and that in such an environment the last thing you want to do is shut down lines of inquiry that proceed from evidence to testable conclusions and so I don't know that there's any way to get your father was to pay attention to the Dark Horse podcast or it's necessarily the thing that would open their eyes but I think what people need to realize is that the voice that is assuring them that things are pretty good and that those crazy ideas on the fringe are really not worth paying attention to none of these people are in a position to explain why we're so you know, unwell as a species that's not something if you go into nature look at any species in nature, you do not see a huge amount of unwellness creatures tend to be well adapted to our to their environments we are very poorly adapted adapted to this one and it has a lot to do with the fact that we've introduced a lot of noise naively into these places and have no idea what the consequences are so really, who is anybody to shut down anybody who's at least doing the work Honestly?

**Heather** 18:42

Yeah. You know, I think for a lot of lifelong liberals, especially of a certain age, the idea of a podcast is also just there's just you're just not going to open that door and both both Breton I write as well and I know many people do and I'm at the moment not you know, like you know find the right piece by one of us you know, I'm thinking your your recent unheard piece just as clearly you know from the left the piece that I had published an area A while back What if we're wrong our book but you know if if our names are at this point somehow solid which is absurd, but I know it's true in some circles, try finding you know, something from that baby or Glenn Greenwald or Barry Weiss those are just the three names that pop up most you're most obviously people with, you know, big sub stacks. You know, the first two are definitely coming from the left and you know, just saying, like, like, we are, like, gotta clean my own house first, right? Like, you know, the critique is, you know, from the left and of the left, because because we see the failures of what was supposed to be our people most acutely?

**Bret** 20:01

Yeah, I think, you know, one last thing on this topic, maybe I've tried to come up with some formulations that cause one to have to engage them consciously here. And I think the idea, you know, these are just me surfacing things that are underlying here, before you ever get around to naming, reluctant radical, right? To be unashamed to be a radical, but to acknowledge that being a radical is not a good idea. It's something one only does if one doesn't have a choice. I think it doesn't take very much looking around the world to realize things are off. And it's not a big extrapolation from there, that we have to change. And we have to change is not a happy message, because change is dangerous. So, you know, can you say to somebody, look, this person is, you know, unashamed, of being on the left and not only on the left, but deeply enough progressive to accept the term radical, which is not a nice term at the moment. Nobody, nobody's proud of being a radical at the moment. And the point is reluctant radical is the answer. It says, you know, that this is a position right, arrived at cautiously and not. not politically, frankly, so.

**Heather** 21:31

Sorry, I think we have elephants in the front yard at the moment. Recover here. Next question. As a nurse, I often work with people who have dementia. These people don't control their impulses, well, they don't mind being offensive. This lack of inhibitions coupled with their age, what make you think that they would be highly racist, as is often portrayed in pop culture. Yet my experience racist dementia patients are much rarer than you might think, many having warm reports, rapport with staff members of color, is this an argument against the idea that we are all inherently racist?

**Bret** 22:07

Yes. 100%. This also matches what we have been saying, which is that it's very rare to encounter, you know, it's not rare to encounter ignorance. In fact, it's more often than not even in oneself. If you do a survey of your own understanding, you will find ignorance in yourself. If you compare it to the world. That is not the same thing as bigotry. Right? It is willful ignorance. That is the you know, the beginning of bigotry and the desire for one race to win out over others. And the fact is this desire to remain ignorant, right, that's part okay. Yeah. The point is, that's just not common. I think most people have actually gotten to the first layer of the Cosmopolitan stack where we've recognized you know, what? Every everything is better when you stop rooting for a phenotype. Yeah, right. I mean, starting with lunch, lunch is so much better when you can go out and have a falafel and not think too much about the political implications of it, because it just tastes good, right? You know, everything is like that the ability to break bread with somebody who 100 years ago might have been viewed as an opposing team, and to learn how the world looks from through their eyes. And to just experience the camaraderie of it it's just so much freaking better and everybody knows this right? There's a reason that you know, as silly as it was the United colors of Benetton resonated with people hated that. Well, it's terrible. It's a caricature. Yeah. Right. And, you know, I'd like to buy the world of coke, like, that's what you want to buy the world. But the point was, I mean, seriously, yes, these are garbage versions. But what they are is proof positive, that the advertising people who are completely amoral, right, they're willing to use our internal circuitry against us. These people have tapped into the fact that people don't want to be racist. They want to see themselves as welcoming and open and whether or not they're any good at it. The point is, it's still not you rooting for your people against other people. Your world is does better when we don't do that. And everybody knows it. And yes, there are a few fucking outliers, but God damn it right? ignorance is common that over or even covert racism thing is not common anymore. All right,

**Heather** 24:38

awesome. Well, that was great. That's awesome. Next question, totally different. How would evolutionary biology explain why younger humans are better protected against COVID than older? Seems paradoxical regarding with regard to adaptive immunity, something else going on besides innate immunity?

**Bret** 24:57

No, I think I think Well, probably something else is going On, but there are two questions. Yeah. And they're separable one is how likely you are to contract COVID. Given the same exposure as somebody else, that's liable to be an innate immunity question, almost entirely. How sick Do you get How well do you tolerate COVID? Could be more complex? It could be I mean, there's a lot of stuff involved in physiology and a lot of it gets less affected with age. And there are certainly diseases that impact the young more than the old and there are diseases that go the other way.

**Heather** 25:34

So but are are both things true? Like we know, we've talked about many times, how much less sick children and young people tend to get when they get COVID. But I'm not I don't actually know off the top of my head, if given the same exposures, if a five year old, a 15 year old have 45 year old and a 75 year old, are differently likely to get sick?

**Bret** 25:57

I think we don't have a certain answer to that question. And the problem in part is that for no reason I can think of we have still a terrible mechanism for testing and no concerted effort, kind of not doing it anyway, right? Like, if we were smart, as you and I have been saying, since the very beginning, if we were smart, we would have test populations in which we surveyed everybody regularly. So we would have some idea how this thing actually spreads. But the problem is, when we test you because you've come come down with something that's made you sick, what we do is we bias the sample against the discovery that you have the disease and haven't become sick, which means the answer could be anything, because we know that young people get sick less severely. That also presumably means that to the extent that there are cases are missing cases, there's more missing cases. So you don't know the answer. And you know, that we don't know the answer. That's one thing. That why we don't know the answer is quite another that is that we're moving

**Heather** 27:01

like the the media and the talking medical heads are acting like we've got good data, right? Is that mean, it's a lie that has deep medical

**Bret** 27:13

effects? Yes. And the fact that the justification for vaccinating young people is predicated on one answer and not the other. Right? You wouldn't vaccinate people who weren't going to come down with it. So there's almost the assumption that they must be coming down with it and transmitting it. Right?

**Heather** 27:32

And maybe they are, but I don't think but there's no excuse

**Bret** 27:35

for not having a really good answer to that question. And a really good answer to that question involves two things. It involves a good reliable test, and it involves applying it to a population enough that you can detect what the actual endogenous rate is, indeed.

**Heather** 27:53

Hi, I am 28 years old male from Holland healthy, not overweight, no underlying health problems or allergies that I'm aware of. I got my first shot of Pfizer, then I heard you live stream with Garrett vandenbosch. Now I am doubting to get my second shot. Yes or no. Any opinions or advice?

**Bret** 28:10

can't give you advice. First

**Heather** 28:11

off, yeah. Always, always have to might. God it's busy here today. So a lot of elephants coming down the driveway. Yeah, we were not medical doctors, and we can't provide advice. But the more I've been thinking about the vaccines that involve two shots, the more it feels to me like if you've had the one you should get the second so that you don't have partial immunity?

**Bret** 28:43

Well, boy, I wish we knew the answer to the question.

**Heather** 28:47

I mean, given that you're gonna have partial immunity in six months anyway, like, like,

**Bret** 28:51

I think, I think the answer is unfortunately, you've been left in a you have been left blind in multiple regards, and how protected you are. We don't know what you are comparing it to even we don't know from your question, and we can't give you advice anyway. So sorry, I mean, there's not much to say.

**Heather** 29:21

Well, I was trying to answer a more general question.

**Bret** 29:25

We don't know. Okay.

**Heather** 29:30

Why are we advised to sleep in a completely darkened silent room? If our ancestors were likely sleeping under moonlight and Starlight amidst the sounds of whether an animal tomfoolery and among snoring kin? I like animal tomfoolery? Yeah, this is this is a great question. The sign I think we can take these separately, dark and silent. So let's go with silent first, which is kind of the easier one, and let's take it to it's sort of it's the even simpler one. When Just like Oh, don't make a noise, the baby is sleeping, okay, if you never make a noise when your baby is sleeping, you're going to make a child that can never sleep, when there's noise like that actually should, should be obvious. And the idea that everyone has to literally tiptoe around the sleeping baby. So that right in this moment, the baby doesn't wake up and make you have to, you know, dandle them a little bit more, whatever it is, is extraordinarily short sighted. So, you know, do what you're going to do around the baby, and you're going to end up with a young child, and then an older child and a young adult, and then an adult, who is actually able to sleep through more disturbance, and is actually able to, you know, be probably less anxious as well. So that's one thing.

**Bret** 30:44

Yeah. Anecdotally, I will also say, our kids shared around for a very long time.

**Heather** 30:51

Yes, they were out of our room, they went, they were in the

**Bret** 30:55

room, and you know, as a nice big room, and they had lots of other space. So they it wasn't like they were corralled together, or really much, but they, you know, they were sleeping in the same room. And I also would point out, as you've mentioned before, you know, there's almost not been an instance where either one of them has gotten up, you know, out of bed after having gone to sleep. You know, it's not been a common occurrence, the way I remember it being a common occurrence in my life, when I was a little kid, right? I got out of bed because I couldn't sleep or things were bugging me or whatever. And I would just say, I think part of this is that each of them got used to sleeping in some situation that was more normal, which was there were people around, and so you weren't constantly woken up by the slightest disturbance, because disturbance was just something you accept. And, you know, I also used to teach a lesson. Back when we were teaching at evergreen, about the fact that the brain is clearly processing the content of auditory information that somebody who lives near the elevated train and the train goes by, and doesn't wake them may wake when they hear somebody turn the doorknob, if there shouldn't be anybody turning the doorknob. That's right. So there's some part of you that's paying attention and calibrates what is worth waking you up for? And so if it's calibrated to an environment in which Yeah, stuff's going on, but it's Yeah, not critical. Yeah. Right. You get used to it. And there is something about our, you know, way of isolating ourselves that I think probably does make nervous sleepers. Absolutely.

**Heather** 32:31

So with regard to light, I think maybe we'll we'll just save that. We're going to be talking about sleep a lot on this next Saturday, because it's the sleep chapter of the book that we'll be talking about, but very short, two very short aspects of the answer our most of the light that we generate, that humans make, is it a different wavelength and a different looks and different intensity than anything we would normally be exposed to. And then, excuse me. People tend to actually sleep less people outside of structures tend to sleep less when the moon is Fuller, suggesting that not only do we have seasonal changes in our circadian patterns, but we have lunar changes in our circadian patterns, and that the more light there is in the sky, the less we're sleeping. Yep.

**Heather** 33:24

I don't I okay, I read the question, but I'm not sure that I can. I'm not sure I can do a good job with this one at the moment. Can you please discuss absolute risk reduction versus relative risk reduction both for the COVID vaccines and ivermectin? Are we comparing the same for both?

**Bret** 33:43

I am light of the current environment. I want to brush up on this before I say anything, because you and I are now being exposed to a standard that I think is rather ridiculous for podcasts. But I think we have to hold off on that. Yeah. And let's answer the second part. I we are not comparing anything fairly. There's a double standard.

**Heather** 34:09

Yeah, I mean, I guess that's like I can't even as I'm trying to think back on the many papers that, you know, we're seeing, like a the papers on vaccines aren't really even papers, by and large, it's like, you know, data coming out of varies and like a very occasion there's papers, but it's, it's not analyzed in the same way. And by and large, it's not the same. It's not the same kinds of assessments. So, you know, what? How can we actually compare them? I'm not?

**Bret** 34:40

Well, they're certainly comparable, if you wanted to organize?

**Heather** 34:43

I mean, given given, given the data that we have, I'm not, yes, it would be possible, but I don't know how if you don't have access to the actual data, how you can use the you know, just the papers that have been written to get at the more fundamental analysis that I think does need to be done. Yep. It's a good question. I wish we had the answer. I remember this one from last week. I thought we might have answered it. Or maybe we saved it for next for this time. So you tell me if we address this or not okay. How do you travel with the severe Vuitton? Should I start over? Yes. Yeah. How do you travel with a severe food allergy? Especially with a language barrier?

**Bret** 35:22

We did not?

**Heather** 35:23

We did not do that one. Yeah, I think it depends on what the allergy is, and where you are, where you are, right? So, you know, if you've got a dairy allergy, and you're traveling in East Asia, you're, you're likely to be okay. And you know, you learn, you know, you will learn the words for the things that you are very, very allergic to, and as many of the permutations of those words as you can, for sure, and you be very gracious and apologetic for not having mastery of the language and you ask about it. But do it's also true that for instance, in in Latin America, you have a strong dietary problem with wheat. And there are lots of ways to say wheat and gluten and flour. And sometimes when people say flour, they mean corn flour, which I don't have a problem with. And sometimes they don't understand that something that's been breaded is actually, you know, got flour in it. And so, you know, in, in a culture where the thing that you're allergic to is prevalent and sometimes cryptic, it can be tough.

**Bret** 36:29

Yeah. In Latin America, virtually the only thing that works is to limit one's diet, consciously to those things that one can be pretty sure aren't going to be polluted with wheat in my case, which is unpleasant because there's lots of other stuff you could potentially eat but it's very hard to ask the question and our experience is that there's not a lot of recognition that there is a problem with wheat so when you start asking is there wheat in this people don't even really know seems like a gringo problem. Right? it's it's a it's a gringo problem. In Italy we ran into the situation where the the cuisine is so heavily wheat based and there's just kind of no you know, we did

**Heather** 37:22

I've heard actually that in parts of Italy it's quite easy to get like gluten free pizza and gluten free pasta but we were we just were lucky enough to be in Venice for a week or so two summers ago. Yeah, it was it was basically non existent. Yeah, it allowed gelato which was not bad. Yeah, it's not bad. And, and Campari, comparing gelato

**Bret** 37:39

we had one experience where the first first night we were there we were trying to figure out how to navigate the the wheat thing and we happen to have a waiter who was fluent in English and at some point we had ended the meal and we wanted to know if we wanted you know, dessert and one of the things for dessert was the cheese plate and we tried to order it and he got very protective of us because I wouldn't have been able to have the bread and that would just isn't done

**Heather** 38:12

that was a that was actually an earlier trip it was actually Paris Eurasia later this he was hired by French

**Bret** 38:19

right it was like you know no cheese plate for you. Yeah. But anyway, yeah, it's a it's a huge problem and the the thing in any place where people aren't sensitive to this the cost of an error just does not dawn on them you know, because some people avoid weed because they think they have an issue and some of us have an issue that it's you know, I got I got a I ordered a gluten free hamburger brown on a hamburger in New York several weeks ago. And halfway through the burger, the waitress came out very apologetic, they had given me the wrong one and there was nothing to be done about it at that point. And I suffered for it for a couple weeks I've just finally gotten over the cough that it gives me as one of its symptoms so anyway, that's a big you know, as a couple weeks of your life being substantially compromised but anyway yeah, I don't think there's a great answer it's

**Heather** 39:18

not a great answer. You know, it really depending on what the allergy is and what the cuisine is like where you are you know, it might be easy and it might be very hard. Yeah. And you know, regardless you know, with the language barrier is real and you know, we basically have it everywhere we go that is not English speaking even though we can you know, we can get by, you always want to learn enough of whatever the local language is, to be polite, and to have your basic formulations, but specifically if you've got a food allergy to learn as many of the permutations of the word that that might be referred to as, so that you can recognize it on a menu. You can say a bunch of different things to, you know, a waiter. And you know, especially if your accent is bad so that you might hit something at some point that they were like, Oh, yeah, actually, I do know what you're talking about now,

**Bret** 40:11

right? We'll say what there's another problem that there's really nothing you can do about, which is that even if you get the word, right, some part of the way we process language basically limits the vocabulary based on how much you think the person you're talking to knows. Yes, yes. Right. Yeah. So to the extent that you're saying, you know, does this have wheat in it? And that's a question. They're not expecting some Yeah.

**Heather** 40:34

Like, this guy doesn't know how to say, man. And you can say we title right. So

**Bret** 40:37

right. So anyway, yeah, it's tough. You know, it might even be worth printing something up that has the question. Right, so that you've got the question phrased and the explanation of why it matters. Yeah, you might get higher quality answer. In fact, I might try that. Yeah.

**Heather** 41:02

Given the infuriating nature of what's going on with COVID and ivermectin, what advice can you give to avoid becoming cynical about humanity's fate?

**Bret** 41:12

I'm going to give you some different advice. I would become cynical no you wouldn't. Yes, I would. I would become cynical. I would spend maybe a week there and then come out the other side you really you get a neat if you spend your life trying to avoid falling into that pit of cynicism, it's going to haunt you if you look into the abyss get used to it and then you say okay, it's going to be a tough fight. How are we going to address this you come out the other side I think I think you'll be happier I think people do make a mistake of spending way too much time trying not to fall into cynicism and rather than just like

**Heather** 41:50

you know, pull him out and realize that it sucks and emerge that

**Bret** 41:54

it's not useful. Yeah, right it's counterproductive So okay, enjoy it. Okay, take take a week off of being hopeful. Enjoy it and then come out the other side and rejoin the house. How's that for counterintuitive?

**Heather** 42:09

Yeah, I wasn't expecting that. Okay, this is a proposal for a variant of fuck marry kill. Which is a framing for what you might do with a person that you encounter who's a stranger I think what? Aye Aye aye, I believe Okay, so I don't know. So choice or sequence No, it's a choice it's not it's not a sequence okay. So the proposed alternative with this apparently Yes you are. Alternative that hippopotamus Rex here proposes is eat fight keep us pet. And the category the representatives of each category that hippopotamus Rex proposes for eat fight keep his pet our long horned sheep. kangaroo an ostrich. Now? Do people keep hostages as pets?

**Bret** 43:09

I know they're not good to eat

**Heather** 43:11

their eggs though. Yeah, I mean, and wasn't that there's some No it wasn't a war it wasn't an ostrich Georgia was an emo war. Back A while ago I don't know about people like keeping hostages as pets. I think they

**Bret** 43:27

make poor pets was eat keep his pet fight to keep his pet problem kangaroo is the I don't think fighting when is such a good idea. No

**Heather** 43:37

fight is the kangaroo eat fight keep his pet long run ship kangaroo ostrich.

**Bret** 43:43

You have to choose in each case.

**Heather** 43:46

You really Yeah. Okay. Well, I sort of thought, Okay. I don't see a pet option here then.

**Bret** 43:59

I mean, I could go for it. A tree kangaroo is a pet. That could be all right, the wallaby. I believe a tree kangaroo is a true kangaroo.

**Heather** 44:09

Well, I mean, I can't remember I thought I thought I thought kangaroos and Wallabies was a clade.

**Bret** 44:14

macropores is going to be the clade and kangaroos

**Heather** 44:16

are actually monophyletic they separate.

**Bret** 44:19

boy am I out of my depth here. I don't know. I should know I could probably end up with a bunch of demerits as a mammalogists for not knowing whether kangaroos is monophyletic or I don't know.

**Heather** 44:35

Okay, we're moving on.

**Bret** 44:38

That didn't go well did it? Alright,

**Heather** 44:41

in theory, could you overcome both cancer and senescence by continuously replacing broken parts the same way cars, monuments, etc, are maintained over long periods? monetary cost aside, I think I think we're actually back to the question from the Discord. I think this is like the arthropod. Well, in response,

**Bret** 44:59

I'm not at For sure, I'm not quite sure what the hypothetical is, yes, there is if you could externally sourced parts. And in fact, this is an example I used to use in my senescence lecture, which is, you know, your car wouldn't get old, either, if it came with a factory that could always produce new parts, or you would just keep replacing them. So that totally works. The

**Heather** 45:21

except, I mean, it's an imperfect analogy for a number of reasons. One of which is that you know, your, your engine isn't reliant upon your radiator in you know, it needs it, both those things need to be present and functioning, but they don't, they don't integrate with one another in an ongoing feedback away. Alright,

**Bret** 45:44

well there. My use of that, in my old lecture on this topic was about the paradox of aging. Right? So it was one piece of it, right? So we seem to have a factory that makes new parts new cells, we humans, yeah, we humans, we, vertebrates, etc. And yet, we have this phenomenon, and the rate of aging doesn't make sense with respect to wearing out. So for example, the fact that a human being who, you know, goes to work in the fields might last 80 years, and a cat who sleeps on the couch. My last 15 is evidence that this isn't the question of wearing out, because you would imagine that the person would wear out a lot faster. And yeah, in fact, they don't. And so there's, there's something interesting going on there. But yes, in principle, if you could replace all the parts exogenously, then there's no reason that you have to age. I would point out, though, but for the feedback, stuff, well, but it No, it's the self repairing stuff, the fact that it's endogenous, that causes the cancer risk, which causes the limits to have to be put on to keep the runaway repair stuff.

**Heather** 47:00

Okay, so my my, but for the feed Becky, retort is you there's a reason we can't just outsource parts that, you know, we're just barely beginning to be able to do this with the old things like total joint replacements and such. But there are a lot of problems they require, requires a lot of work, and it's still really touch and go well,

**Bret** 47:21

and there's a giant fly in the ointment. Even if you were to figure this one out, which is the brain, right? Your brain is an informational system. And even if you could solve its physiological aging problems, you cannot solve through any known mechanism, we understand far too little about how it even works, to know what to do with the fact that your brain is built to accumulate information and forget at a proper rate that you can live a functional life of 8090 years. And you would have to rewire it, let's say you were gonna live 500 years or if you eliminated the endogenous tendency to age, we know that you might live 1000 years. That is to say, if you extrapolate from a human being on the on the cusp of where aging begins, if you extrapolate from their rate of death at that moment, just before getting to 1200 years, or something that would be true for 50% of the population or something like that. But in any case, if you did that, then the point is okay, now you've got a brain that is wired to remember and forget, for a period of 80 years. And do you want to forget a huge amount more in order to be able to extend that process for 1000 years? Right? How do you reprogram the brain for this and we just don't have the foggiest notion, right?

**Heather** 48:56

My dog passed away last Monday, the loss is still keen, I often contemplate his mortality. It still did not prepare me much love and thank you for giving Moxie a good life. Thank you.

**Bret** 49:09

Yeah, thank you. Sort of wish I knew more about the story because there is a fair amount to say about how to how to think about a pet's life. But yeah, I don't know very much.

**Heather** 49:26

Are you familiar with Dr. A lot? kanojia. I probably butchering that name also, aka Dr. Kay, from the healthy gamer community would love to see you to discuss the evolution of negative emotion, addiction and purpose. I don't know I don't know that name. We do actually have a little section on addiction in the adulthood chapter, the pen penultimate chapter of the book. But it sounds like there's some there's something deeper here than where we go in the whole section. But neither of us are aware of him or her ISI. So it seems that those of us who are unvaccinated so far are the bad guys. Now, how much of this is deserved?

**Bret** 50:11

I think we're being set up to be the bad guys very clearly that's in the messaging. In fact, it was trending on Twitter pandemic of the unvaccinated, which is incredibly obnoxious, because even if you want to say that the unvaccinated have some role to play in this, obviously, the vaccinated due to, right, because we've got a pandemic of variants now. And the variants are very clearly related. You know, how they're related, reasonable people can disagree on that. But there does seem to be a tendency of these vaccines to select for variants that escaped the protection generated by the vaccines. So let's put it this way. Whoever it is, that is arguing that we are not all in this together. They are the enemy. We are in this together, you have a pandemic that none of us started, right, we have an obligation to figure out how best to address it. When we have been hobbled with incredibly bad information and incredibly powerful propaganda campaigns. And even to the extent that somebody on this map looks confused to you, they're confused, right? Even if that's us, if we are confused, we are honorably confused, we have no stake in this matter, other than wanting humanity to come through it as well as possible. And we have demonstrated that time and again, so look, anybody who's portraying somebody else here as the enemy unless that somebody else was actually involved in producing this virus, and even then, if they produced it as an accident, there's no reason to be demonizing anybody. Those who would demonize us are the problem.

**Heather** 52:08

Good. Could we crowdfund a large scale RCT regarding the health impacts of long term prophylactic use of ivermectin in healthy adults?

**Bret** 52:18

Yeah, that's one possibility. It's, it's one possibility. I think people need to realize how much money you would be talking about to do a large scale RCT and this is not our area of expertise by my

**Heather** 52:33

throat neither running RCTs nor nor nor moon grants.

**Bret** 52:38

But I've been led to understand the different order of magnitude is something like 20 million bucks for a large RCT. So yes, Could somebody do it? They sure could. But

**Heather** 52:47

it's a lot of money. A lot of money. Yeah. Well, I promote an interfere with substances like lysosomes or Phyto psalms or other medications like ACE inhibitors or CYP three, a four inhibitors that less than or know what it is.

**Bret** 53:01

Well, and there are two things we can say about this. Yeah. One is welcome to complex systems, you have no idea what this could interface with, in principle, it could interface with just about anything. Yeah, will it? Right, what I would say is the overwhelming safety profile, the fact that this drug appears not to be disruptive across a huge range of circumstances, says your chances are better than they might be. Right. So something about the way the drug functions, seems not to be causing huge numbers of problems except in you know, cases of, for example, people who are so thoroughly parasitized that the death of their parasites causes an issue. And so that's one thing we see. But yeah. But yeah, they're Look, they're just no guarantees, right? You're talking about introducing a compound that is not endogenous to the body into the body in a. It's a complex system, period. And so yeah, the only the only thing one can say is, your chances are probably better with this molecule, because empirically speaking, it doesn't seem to interfere with lots of essential stuff.

**Heather** 54:17

That's right. so grateful to have found you, thank you for your care, your love and your courage. I think you may have just addressed this, but how confident can we be in the various data? Well, there's a paper that I talked about last week. That was this is the paper that was looking at the first 250 people who were entered in the various system and then also died and they were looking at whether or not they were, as it turns out, none of them were coded as vaccine deaths, and they were all coded as COVID deaths, which was somewhat suspect. But as part of that research, those authors found Africa I don't remember the numbers, but it was something north of 50% southen 75% where they were totally confident that the day that the entries were made by healthcare professionals and then another like 5%, or something that was made by pharmaceutical person, I think, I think that's right. So there's sort of like a side note in that paper, where they said, actually, you know, at least a large majority of these data we can reliably ascertain are are legit. That's the only piece of information I have. You know, there are people there are people arguing both sides of this, you know, it's it, it isn't reliable, because people are going to be, you know, want to put in bad information, because they want to promote the vaccines because they want to de promote the vaccines. And, you know, both are possibilities, but at least from that one, that one analysis suggested that at least most of the data are good.

**Bret** 55:55

Well, I would I would do the analysis a little bit differently. I would say, and I'll just speak personally, I don't trust the various data at all, I don't think that system was set up. In order to be a proper data collection mechanism, certain things seem to be true. In an average year, it seems to be a dramatic under collection of relevant information. It is also true that you cannot just simply assume anything in that system is correlated, that the system will collect a certain number of events that are unrelated to the vaccines in question. However, to the extent that the system is anything, it is a mechanism for detecting an anomalous signal of harm. There is an anomalous signal of harm. Could that have another explanation? Of course, somebody could have, you know, some economic competitor could have arranged for such a thing. Does that show up in the study you're talking about? No, it does not? Nope, no

**Heather** 56:56

way for it to?

**Bret** 56:57

No way for it to. But the point is, what is the right thing to do when faced with a system that undercounts and is there for the express purpose of detecting an adverse events signal, when a massive signal shows up the right thing to do is to assume that that signal means something until proven otherwise. And we are not doing that. So how reliable is the data? I would say not reliable? How unusual is it? How conspicuous is it? How inexplicable is it that a signal as powerful as this one would show up there? And it would cause no response? It's almost impossible to imagine the signal is so strong, that it needs an explanation. And if that explanation is anything other than vaccine caused harm, then it should be an urgent priority to figure it out. And in fact, I would point this out. The incentive to find another explanation if there is one for that adverse events signal is so great that it is rather like the pressure to find a population of carnivorous in China somewhere that has some SARS Coby to ancestor and the failure to have heard a credible alternative explanation is conspicuous.

**Heather** 58:11

That's good. That's very good. I mean, it's terrible. But it's terrible. Yeah. But I mean, what? No, but a lot, the logic is perfect.

**Bret** 58:19

And we in the public are entitled to presume Something is wrong to the extent that there's a massive signal there, it doesn't appear to be triggering anybody to do anything. And it hasn't generated a cogent alternative explanation, right? So what that means is the onus is now on those who are so sure it doesn't mean anything to explain how

**Heather** 58:36

the hell that can be. Yeah, instead of branching things to get people to shut up. Yeah. Information on COVID. And preventatives is so confusing and conflicted by design, maybe, where can we find honest information and resources? Yeah, you know, we're trying to do that. And the scientific literature is a mess. But there are some good there, there is some good stuff in there, which we try to bring some of it. But you know that there are some voices out there who are trying to do this. And it's hard because of censorship

**Bret** 59:16

is hard because of censorship. And it's hard because you have no, I, there's no good way to apply a standard that would allow you to know, this is good. This is who's a shill, right? And you can discount a shill and who actually has an honest disagreement. And so what I can say is where you have the possibility for profit, you have to raise the question of whether or not there's a corruption. Yeah. So that's that is to say you should be more wary where there's a large profit to be made than where there's no profit to be made. And then within the category of Hey, there's no profit to be made or this person is clearly not in a position to make that profit, then the question is, well, how How? How committed do they apparently seem to be with respect to following the evidence where it leads correctly? Takes? But no, there's you know, I think the question to ask is not is there someplace to go for reliable information there isn't? Why isn't there? That's the question. Obviously, everybody wants a reliable source of information on this topic. And the answer as to why there isn't one has to do with somebody having an incentive to disrupt every attempt to produce such a thing, because the obvious opportunity for anybody who managed to produce such a thing would be so great. Yeah.

**Heather** 1:00:41

on balance, I think the quillette article was not well received by its readers or by rebel wisdom. Also, is Heather an INTJ. And Myers Briggs.

**Bret** 1:00:51

Yeah. struggling for a connection between.

**Heather** 1:00:59

I think it's, I think it's just two things.

**Bret** 1:01:02

Yeah, that mean, yeah, well, look, well, that article was nonsense. And anybody who knew enough about this landscape to go through it and just even spot check it figure that out? Yeah. So I think also, the response of Yuri has actually explained a lot is unreasonableness shows up so potently in his interactions with the public on this topic, that, you know, it's, it's easier to understand why the article is so bad. I've seen less from Claire berlinski, in the aftermath of the article. So anyway, yeah, it is interesting.

**Heather** 1:02:00

To the data coming out of Israel in the UK potentially confirmed Vanden Bush's suspicions about mass vaccination during a pandemic. Yes, and no, yeah, that's what I was gonna say,

**Bret** 1:02:09

yeah, you have to be super careful, because there's a confound in there, which people have pointed out, which is to the extent that you have a highly vaccinated population, it's not so surprising, you know, a large fraction of cases would be amongst the vaccinated, right. So it is not, you know, people broadcast these headlines. 95% of cases are amongst vaccinated people.

**Heather** 1:02:32

But there's but one of the other results is, you know, much less about the UK, but also in Israel. A very high proportion of the cases are I think it's Delta variant. So like that, you know, that that feels even more closely aligned with panda Bush's prediction. So

**Bret** 1:02:47

essentially, it's a little hard. Because Yeah, we don't know the origin story of delta by the fact that it does seem to escape from the immune surveillance initiated or induced by the vaccines is conspicuous. So what I would say is, I haven't seen the proper study to evaluate Vanda Bush's hypothesis, as compared to its competitors. Yeah, but superficially speaking, we are seeing a proliferation of variants, they do seem to render the vaccines less successful at preventing them and that is all loosely consistent with it, at the very least, so it is predicted at one level. But I would like to see better, better evidence more rigorously evaluated. And in fact, what has happened is the dismissal of Garrett Vanden Bush's iPod emphasis has set the stage to fail to evaluate whether or not it's right is obviously unscientific.

**Heather** 1:03:51

Yep. off topic and maybe out of your wheelhouse, but do you have any opinion on kangen water? I've never heard of that. But then parentheses low acidity beneficial or snake oil. So you know, I've run into the alkaline water right now, can you get it? It's gonna be high in the pH scale. I actually don't know what higher the pH scale means with regard to water. You mean how I yeah, it's like, are we talking nine? We're talking 12. Nine, okay. So yeah, basic, basic water. Yeah. You know, I, I don't I don't know I haven't thought through what the potential physiological mechanisms would be a few people who might otherwise respect tremendously on issues of health and wellness, swear by their alkaline water and

**Bret** 1:04:46

swear by it, meaning they think it does what

**Heather** 1:04:50

they think it improves their sense of wellness and I like I'm sure if I asked them, I could get more students more precision than that but they they love it they find themselves drawn to it they find themselves wanting it when all they have is normals are pH neutral or slightly acidic. Why I think generally like city water tends to be slightly acidic. Maybe like, you know, high six something like this. I maybe I'm wrong about that, but no, but, but just because you're used to it, and just because you want it might only mean that you're used to it. Alright, I don't know.

**Bret** 1:05:31

I want to riff a little bit here, do it. One thing out in nature. I don't recall any instance of feeling slippery water.

**Heather** 1:05:43

But have you had alkaline water? This this is not so that I have and the water that's being bottled out and sold and you know, maybe this snake oil and just you get to charge twice as much, whatever. isn't so alkaline that tastes slippery. Now,

**Bret** 1:05:55

I'd be curious as to whether or not there's any bias toward alkaline water in the wild? Yeah, it is possible. So if there's not, then I would say you don't inherently want alkaline water, though, it could be that some novel feature of our environment is compensated for by alkaline water. So let's say the metal and the pipes, you know, could create an acidic environment that I'm just off the top of my head, I have no reason to think this is true. But if it did create an acidic environment, then you dump a little alkaline water on it, it tends to neutralize the acid and the base come together, they make more water. And so you restore, you would restore in that way, the reality of neutrality. Yeah. And I would say my guess here

**Heather** 1:06:37

is that it's a corrective to hyper novelty.

**Bret** 1:06:41

Well, if it works at all right, not Yes. I'm not yet compelled that it does. Yeah, it does. I don't rule it out. There's obviously mechanisms that it could. But the other question is, as as we went through with the issue of medical finger wagging about salt intake, right? Yeah. So doctors have been wagging their fingers at us over salt forever. And the basic punchline to the salt story is that we're really good at regulating salt, because it's something we've been doing

**Heather** 1:07:13

one asterisk, right, the one asterisk is, if you're cooking your own food, or if you're eating at a restaurant that is cooking all of its own food. Yeah, you're really unlikely to be taking in too much salt. If you're eating processed foods, yeah, which are covering for the randomness of a bunch of industrial processes. Yeah, by adding flavors in rich sort of reductionist forms afterwards and, and salt is an enhancer of flavor. You may well be be getting way too much salt. Yeah, and you don't taste the salt because there's it's it's just this like pieces parts thing that isn't really food in in such thing. So sort of the longer shelf life of the foods that you're eating, the more likely you are to be getting too much salt, right? That's

**Bret** 1:07:57

also that question of what the impact of that is. And the body is actually pretty good at regulating levels even

**Heather** 1:08:03

even even that but like really, if you're cooking at home, and you're cooking at restaurants that actually make make your own food and and you're adding salt liberally and you know your spouse or whatever is like Oh, stop it with the salt. Like you don't need to. Yeah.

**Bret** 1:08:17

So the question is, is acidity, also a parameter that to the extent that your physiology is off, it is very good at correcting for now I don't know people who get acid reflux and stuff like that, which is labeled to be I know that I had acid or acid reflux, until I discovered that I was eating something that I was intensely allergic to wheat. Yeah, at which point it completely cleared up when I eliminated wheat from my diet, so I don't know whether or not my instinct says this isn't labeled to be a thing naturally it could be compensated for a novel phenomenon, but I remain to be convinced

**Heather** 1:08:56

good. Wood Martian mushrooms be nutritious poisonous. suggestible. Yeah, indigestible.

**Bret** 1:09:09

And the reason for that the reason for that is because you don't have the mechanism you know likelihood to process something mushroom like that, you know, I mean, look, you can't even eat a

**Heather** 1:09:20

tree unless there was a single origin for life on Earth and Mars, right? But even when in which case

1:09:24

it is no longer possible, yes, but it's barely

**Heather** 1:09:27

barely possible if they share a basic information molecule, but

**Bret** 1:09:31

Okay, so nutritious now because you probably won't be able to break it down at all right? Yeah. poisonous, well, it could disrupt your system in the same way that you know, you could get heavy metal poisoning from eating inorganic stuff. So there's something about it that could interface badly with your physiology. But the reason that mushrooms are toxic, or so many mushrooms are toxic, is because they are trying to dissuade things that would eat them from doing so and so They've built molecules that interface with the physiology of things that eat other things in a disruptive way. So the mushrooms on some other planet are not going to have produced a toxin. It's going to interface with your physiology because they don't know anything about your physiology. They've had no history with creatures like us. So yeah, I would say you should look at a mushroom on a foreign planet more or less. Like you would look at a rock on a foreign planet and don't ingest either.

**Heather** 1:10:26

Okay, we must be well over an hour at this point. Okay, we're gonna do one more in less. Yeah, maybe we'll just do. We'll do two more. All right, we'll

**Bret** 1:10:39

do two more.

**Heather** 1:10:41

Does the nature of the lambda variant suggest that SARS COVID. Two is mutating to beat vaccine defenses. See trial site news article on study? I don't I have not seen this and I don't know anything particular about the lambda variant. Do you I mean I feel it feels to me like, like the presence, the rise of the variance is evidence in that direction. But it's not clear how strong that evidence is. Yeah, I agree. Okay, and then this one, can you correct? Oh, actually, there's also actually, two just comments before I get the last one. Sorry to hear your cat meowing today. I think he's missing his little friend. He definitely is. And will the book also have an audiobook version? Who's the narrator? We're actually doing this next week. And at the moment, the plan is for it to be both of us simultaneously.

**Bret** 1:11:34

Yeah, we're going to alternate sentences, if not words.

**Heather** 1:11:41

And then last question, can you correct for dysbiosis with fecal transplant? Interesting question that that question is addressed in one tiny little paragraph these papers that I was reading from that I'll put in the show notes. A couple of them are really quite expensive. They got hundreds of references. So I obviously did not chase down all of them by any means. But there is some evidence that in some cases, yes, fecal transplant can work. The question though, would be how do you keep your microbiome going? How do you keep the new the new microbiome healthy and intact? If you're not constantly getting fed from your environment? Yeah. Well, you

**Bret** 1:12:20

could look it up in the appendix.

**Heather** 1:12:23

Yep. Good, actually. Yeah, I think we're done. Now that was good. That was good. You get points for that. All right.

**Bret** 1:12:31

Now I got points. So yeah, you'll know why I get points for that one. When you read our book, it will explain that pun if you don't get it already. It

**Heather** 1:12:39

will. It will indeed. All right. Well, we are done for today. We are done for today. Please consider joining us either our patrons and subscribing to any or all of the four channels the two on YouTube, the two on Odyssey this main channel that you're watching on right now. And also the Dark Horse podcast clips channel on both Odyssey and YouTube. What else am I supposed to say? Oh, the clothing Oh store Dark Horse podcast.org. And like, like and share. I can

**Bret** 1:13:21

share. Like, share, subscribe. Spread the word.

**Heather** 1:13:25

Yeah. Yeah. All right. You got an overall budget. Be good to the ones you love, a good food and get outside for

**Bret** 1:13:36

a while, everyone