Your Questions Answered - Bret and Heather 60th DarkHorse Po...

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**SPEAKERS**

Bret, Heather

**Bret** 00:05

Hey folks, welcome back to the Dark Horse podcast live stream a FAQ section we are raring to go. Oh, we

**Heather** 00:15

go in jeopardy edition. Answers

**Bret** 00:17

jeopardy. Yep, we're gonna start with the answers. And then you guys file the questions as quick as you can. All right. All right petunias. Nice. Nice. Nice, nice nice. You don't know what question that

**Heather** 00:30

Gorilla Glue.

**Bret** 00:32

Wonderful. Maybe we ought to go back to the standard form. Okay, are we Oh, but before we do that?

**Heather** 00:39

No, actually, before you do that. Last week, we had a rare showing from our third our eldest cat and he is back now. So for those of you curious, the darkest member of our current household is, is here that's that's Tesla.

**Bret** 00:55

Yes. Tesla named after the scientist, not the vehicle. It's not that we have anything against the vehicle, but named after the man himself. After the livestream ended during our intermission, I also long ago immediately locate my shrew skull, which is here. And really, I'm not sure you'll get very much out of seeing it. So what we'll get is that we are the kind of podcast that has a shrew skull when needed for demonstration purposes.

**Heather** 01:28

What else do you have in there?

**Bret** 01:30

I believe. This is a hippo said Darrin.

**Heather** 01:36

No one else has a HIPAA dare and SCO other podcasts may have a shoe scope of the HIPAA stare at skull.

**Heather** 01:41

I don't think so. Take that Smarter Every Day.

**Heather** 01:45

So HIPAA security you said it and I talked over you is a corrupt one. Yes, it's

**Bret** 01:49

about a horseshoe bat. And then here we have a file of stomata. Another bat. Yeah, their microbiome knows that this these are the guys that I studied. You can tell

**Heather** 01:59

from the skull that the leaf nose is soft tissue, not skeletal.

**Bret** 02:03

Yep, absolutely can Alright, well, that was fun for me anyway.

**Heather** 02:08

Me too. Moxie apparently had

**Bret** 02:10

enough in his left arm. Yeah, please hit the road. Yeah, to

**Heather** 02:13

the boy cats are here though. They're working through their cream. All right. Okay, so we are going to start with four questions from Episode 59. Go to a question from the discord. We take one question from the discord every week and then move right into your questions from this last hour before moving into questions from the current hour. All right. All right.

**Bret** 02:31

We will turn them all into questions for the current hour. stating the obvious because it allowed me to be in on the Congress. I

**Heather** 02:44

don't think you have any problem with that. Keeping the flow. You're the guy who brought a HIPAA data and scowl to the podcast man. Hell yeah. Yeah. And a fellow stoma and a shrew of some Latin name that I don't know. Yeah, I don't know what the family of takes

**Bret** 02:57

that veritasium I am picking fights with other spod cast seemed like the thing I

**Heather** 03:06

guess dead as a lesbian who's never come. So this is. This is the first question. I promised to get to it last week. As a lesbian who has never conformed to sex stereotypes. I am curious, what makes real trans woman is not something to identify into live not by lies. And that last a reference to both social Ethan's essay and perhaps also Rogers book of the same name that we talked about extensively in Episode 50. So this is a conversation for a longer than a q&a. And I think we may go there a little bit in the letter wiki that Abigail schreyer and I do maybe a little bit, but I would say this that sex is based on what type of gamete you produce, right? If it's small and Zippy versus large, and style your male versus female. What sex you are, is determined in mammals by your chromosomes, which then affect things beyond your, your steroid hormones, but the steroid hormones being sort of primarily androgens are primarily estrogens and progesterone, being highly descriptive of what of whether or not you're going to become male or female. And so you have you have chromosomal sex, you have anatomical and physiological sex, which is largely described by endocrinology. Although it turns out the the actual chromosomes the actual X and Y at the 23rd location, also, even absent differences in in hormone levels can affect sex, like how you manifest your primary and secondary sex characteristics. And then you also have ways that your sex is revealed in your in your brain, which includes not just like the white matter and gray matter, but also how it is that you perceive what sex you are, we are so complicated and there's so many things going on. But it shouldn't be surprising to us that under some conditions, one or more of those systems is not entirely concilium. And so that that is my very short description, you know, when when one or more of those systems is not consistent with all the rest, you will have someone who looks one way and is in fact one sex but feels so certain in themselves that they are the other thing. That is not that you know that that is what gender dysphoria is that you you have a mismatch. And generally, you know, it's talked about between sort of your brain sex, what what it is that your brain is assuring you of as opposed to the other demarcations of sex, which are of course, the actual biological sex that you are.

**Bret** 06:03

Yep, I would say, you know, this gets more difficult to deal with, the more trans is taken to be normal, I don't mean there's anything abnormal about it, because I actually don't think there is I think it's got his historical roots, it's

**Heather** 06:22

super, anything super rare, can be considered abnormal?

**Bret** 06:27

Well, I don't want to say that. Okay, so the problem is abnormal, carries the connotation of dysfunction. And I think there's real trends in the sense that we see it reflected in many cultures built in its ancient, which doesn't rule out the possibility of arriving there through dysfunction in modern times, be it, you know, hormones in the environment, you know, or hormone mimics, or whatever. However, my point is just simply, there is, I don't think being trans is easy. And that is to say that at the point, that the discomfort of living within the sex to which you were born, is so great that you are ready to confront the complexity difficulty of transition, then the point is, you're actually saying something about the degree to which things feel off, and then you'd actually, you know, prefer to confront that process of transition than to remain where you were. So to the extent that we are going to valorize transition, and encourage people to think that any sense that they have the things that are off are definitely an indication that you're trans, then this loses all meaning. But and in fact, that's that's really the the key thing that I want to say is that, you know, we all all of us, who have grown up in modern times, have dealt with the confusion of living in a world that is not well suited to us, right isn't and so the number of people who are going to have the sense, something is definitely profoundly off and I need a solution. And that number of people is going to be high. And therefore the number of people who will say, I know what it is, I don't much like these sex roles that are inflicted on me, I had no choice about them. And you know what, I actually think I prefer that other thing, number of people who will think that that's a solution until they've actually attempted it and discovered actually, you know, what? Things are just generally off because the world is not well structured for people.

**Heather** 08:35

Yeah, no, it's, it's a, it's a perfect storm, where all the lunacy of post modernity meets all of the market force and ability to do and both of these things really do great damage of Big Pharma. And you just get these two things together in this perfect storm in in, in trans and you know, I often would say, you know, it's trans rights activists, as opposed to truly trans people truly transmissible being a much tinier, much tinier population, with presumably some slight overlap between those and you know, sort of everyone else who's, who's doing some combination of activism and cosplay and LARPing and benefiting from pharmaceutical intervention, the likes of, you know, the, we do not many the downstream effects of a lot of the pharmaceuticals, both the hormone blockers and the puberty blockers and the actual cross sex hormones that are being used. And we don't know most of them guarantee you, but the combination of reality is what I say it is, and I will, I'm going to use the market driven product over here about which we know nothing and the makers of which will not protect me in any way once the downstream effects are discovered. comes together just perfectly in this really, really terrible moment. So that is not to say again, that there isn't some very tiny number of people who are really legitimately trans and who are better off who live more complete lives, most of which don't have anything to do with their trans ness, from being able to transition.

**Bret** 10:14

And I think, maybe to say this in a way that's clearer than I've ever said before, hopefully, there is something about the desire to avail oneself of scientific help in transitioning while denying the implications of scientific study with respect to things like sex and gender. One ought to be obligated to one side of this, either you're postmodern, and you really think the science stuff is just a posture that people strike in which case, you're wrong. But you're entitled to be wrong in that way. Or you believe in science, and you both wanted to help but then are, in some sense, obligated to the method for figuring out what's true and what isn't. And it is, I think, driving many of us crazy to watch a desire for science. Allah cart, right? I want the drugs, I want the surgery, I do not want to have to listen to another word about the difference between the sexes or the binary pneus of sex or gametes, or any of those things

**Heather** 11:21

down with trade offs.

**Bret** 11:25

Yeah, down the the utopians who aren't up for the fact of trade offs are a real problem and not listening to them would

**Heather** 11:34

be a very good idea. But all you have to do is sit down with trade offs, and they're done, I guess. Yeah. Next question. I remember in a past episode some months ago, you guys question some of the typical procedures done directly after a baby is born. I'm having a baby soon and want to make sure I do what's best. So I included this. I don't remember. I don't remember our comments on this front. I don't remember if we're talking about some of the typical procedures done directly after a baby is born. But do it again a conversation for a longer time. Certainly, much ink has been spilled over the medicalizing of many modern birth procedures. That said as we talked about in the last hour we humans are so brainy and our babies still so unformed at the point that they're born the childbirth really is actually quite dangerous and so you know No, you should not have you should not opt for a C section because you kind of find the idea of vaginal delivery achy or something that's actually you're likely to to relegate your child to a lifetime of for instance reduced immune function as as as a result or at least early early infancy of reduced immune function and things like using forceps to pull the baby out of the birth canal you know not not a good move. Typical procedure is done directly after a baby is born I don't know there's measurement and stuff which seems okay and I you know, basically baby and mom should be right next to each other right away. That's that's, that's the big thing. But I feel like even even most modern hospitals, no longer sort of separate baby and mom and don't let them near each other,

**Bret** 13:20

in part because they were sick and tired of being blamed for displacing babies and swapping them out with other ones. Maybe if it solved that problem. Yes, if that's not your baby, it's on you. It's kind of their new approach I think. Because you had it the whole time.

**Heather** 13:37

Talking about the baby literally being on a person

**Bret** 13:39

I'm talking about I remember this actually from from when Zach was born, that the baby is never out of your sight. And so the chances if the baby has been swapped it wasn't the hospital I think is their point

**Heather** 13:52

is swapped in utero.

**Bret** 13:56

If it was swapped it was you and some other mother in the hallway. And that's not on them. Yeah, yeah, I would say I'm very I'm troubled by incendiary gender reveal parties in the flammable West

**Heather** 14:12

that happens before the baby is born isn't it does. After the baby is born, you don't need a gender reveal party with like, your friends.

**Bret** 14:21

That's not what these things are. Okay, I'm so out of touch. That I apparently misunderstand the social.

**Heather** 14:30

I mean, we so we, we didn't want to know the sex of our babies before they were born. But most people who have the kinds of prenatal testing that we had, and with which shows whether or not at that 23rd position, you got an x x or an x, y. And the gender reveal parties I understand happened shortly after those results come and you're like, Look, it's a it's a boy, it's a girl. It's going to be a boy, it's going to be a girl. I'm going to light up some fireworks and part

**Bret** 14:58

of the neighbors Alright, okay, well, yeah, I'm not anything else.

**Heather** 15:03

I mean, so you came up with nothing?

**Bret** 15:05

so far? No, yeah, no, nothing but nothing useful.

**Heather** 15:09

Nothing responsive to the actual question.

**Bret** 15:11

Yeah, that not to put too fine a point on it.

**Heather** 15:16

I guess I'd be interested in a follow up if there any, if if you have, you know, if there's five things that are being done that I'm not thinking of that we're not thinking of where that maybe didn't even happen 14 and 16 years ago, with regard to typical procedures, and yeah, you know, I'm a bet. And we have a pretty immediately formed opinions based on what we understand about childbirth and deep history.

**Bret** 15:39

Yep, I would say delaying procedures, as you say, directly after the baby is born, which makes me worry that we're dismissing the category, but delaying procedures for which there's no early benefit for as long as possible. Right? In other words, kids gonna get a vaccine. And the reason they're getting the vaccine is because ultimately, they're going to end up in daycare, well,

**Heather** 16:07

don't wait as long as possible and wait as long as possible. Yep. That better if, again, vaginal birth and breastfeeding, are providing the kids immunity for a good long time. And you know, if you can't do one or both of those, then you're in a different position.

**Bret** 16:23

But Yep. But I think you know, the general guide. And you know, there's a lot of this, of course, in our book, but the general guide is, don't disrupt the normal and intuitive. Yeah, the baby is built to be raised, you're built to raise it. And, you know, there are reasons to change things, right? Like, breast pumping, obviously, allows a woman to integrate the feeding of her child with her own breast milk into a world that isn't particularly well built for it. But it has risks associated with it that are subtle.

**Heather** 17:03

Yeah, actually, so we mentioned this, in the book, our student, Josie Jarvis, I think generated a hypothesis that now actually, I think, has some possibly some support in the literature, although I'm not positive with that last part, which was that breast milk may also have basically circadian cues, temporal cues. And so helping train a baby's wake sleep pattern, such that, what that means is that if you do if you are breastfeeding, and you do pumps, such that the child is sometimes getting your milk, but not directly from your breast, that you should basically not just, you know, take care to make it sterile and freeze it promptly and all of this but actually timestamp it, and and give your child breast milk that was pumped at the same time, as you're now feeding it to them, else, you're likely to make them even more chaotically sleeping and waking at times that are not going to be particularly pleasing to you.

**Bret** 18:03

And what fraction of the dysfunction around childhood sleep is going to turn out to be the result that either you broke this bond entirely by using formula or you broke it, you introduce noise by taking breast milk randomly with respect to time of day, a huge amount and then all sorts of things maybe downstream of that mental health, etc. So anyway, very easy to disrupt a well architected system in which nothing is labeled as to what it's actually doing. And you think, you know, milk is food? No, yeah, milk is a lot of things. Food is one of them. Yeah. But it's also information

**Heather** 18:42

well, and we do that, I mean, food is nutrition. No food is also community building and bonding, you know, sex is reproduction. No, sex is also relationship building and bonding, you know, and in humans, we turn these things that had these very, you know, in, in, in older organisms were pretty simple. You know, food was just about nutrition and keeping yourself warm and, and metabolism and all sex was just about reproduction. But in humans, and you know, and our closest relatives and in some other organisms as well, these things have become imbued with much more meaning. And that's not fake. And it's not a social construct. It's just, it's true. Yep. Next question. Can you talk about getting the vaccine now while pregnant?

**Bret** 19:29

Who says I'm pregnant?

**Heather** 19:31

would mean talk to you?

**Bret** 19:35

Yeah, so this is a tough one. You're down you're dealing with

**Heather** 19:39

if there's no tests, right, man that we have no idea. Like, no, there's been no safety testing on pregnant

**Bret** 19:44

pregnant women. Also, there has been very little, I'm sure there's some but there's been very little evidence of what the effect on on babies of their mothers having gotten COVID while pregnant I

**Heather** 20:00

just saw so you're right. And I just saw it and I don't have it to pull up. That apparently immunity that woman has from having had COVID does seem to be passed on to the baby through breast milk. So

**Bret** 20:16

that's definitely through breast milk.

**Heather** 20:18

I that was that was what I saw. But I, I don't want to vouch for how good that that research was. Yep.

**Bret** 20:26

So I guess what I would say is, I think you are liable to face a medical establishment which will underrate the danger not to say that there was any harm, as we've talked about, there's a distinction, there is a danger in playing Russian roulette, there's not necessarily a harm if you get one of the empty chambers. So there is a danger and what we don't know. And that danger is higher than you will be told because the system when it says that something is safe, is really telling you over very short timescales, it's safe. And you have to compare that to the danger on the other side, which is this is a very serious disease, it does long term damage it would appear and how you compare those things, I don't know. But I would say, to the extent that what you really have is something else you can borrow from, which is if you can stand to isolate yourself more fully than others, and protect yourself that way, and delay the vaccine until we know more about it. That's probably what I would do.

**Heather** 21:41

Yeah. And, you know, as as with every question about whether or not you can do a thing while pregnant, if you're going to, you know, the earlier in your pregnancy you are, the longer you would have to wait before getting vaccinated if you've decided not to do it while pregnant, but the more fragile that embryo is, and the more likely that something bad can happen with the pregnancy as a result of a foreign agent being introduced. The later in pregnancy You are the shorter you would have to delay it. In order to not take it while pregnant. On the other hand, that kid is less and less fragile every passing day. So you know, those those concerns run in opposite directions. And you just it's not pregnant? Or not actually, even though you know that that's an old joke from I don't know the 50s or 60s I'm a little bit pregnant. Well, no, you're either pregnant or you're not. But how it is that you behave as a result is wildly different when you're seven weeks pregnant versus seven months pregnant. Yeah. Final question from LA from Episode 59. Suppose I had an idea that could possibly address the fourth frontier problem. I want to explore this idea but I'm limited by the technology of my wallet, and the disinterest of my friends and family What should I do?

**Bret** 23:02

You got to figure out how to present this to your friends and family in a more compelling way I mean pretty clearly.

**Heather** 23:09

So that's what you that's, you got to be able to pitch it first to at least a few people close to you. Whereas you have no idea

**Bret** 23:15

I would say I mean there's something in the question the disinterest of your friends and family my sense of if we're talking about the same thing this is super consequential and pretty interesting and anyway yeah, I think figuring out how to pitch it to them as a good is a good plan terms of exploring it keys Yeah, I don't know i mean you know,

**Heather** 23:42

but I think that's a great first step and you know given given what the nature of the fourth frontier is which is to say you don't you don't have a blueprint in advance but you got to find the slope and in terms of getting people to poke at it and see if it makes sense and you know once you have a few people who have hopefully said Yeah, actually this but not this here, here we go. Then using using their help to help spread it you know, is by no means any guarantee at all. But it has a much greater chance both of success and that it itself is a solid idea than if you try to work entirely alone. Yeah,

**Bret** 24:20

that's the thing is you need you need people who will push back and cause you to find out what you don't know about your own idea.

**Heather** 24:26

That's right. Okay, this from the discord server. This addressed to me in particular, there's this vague mystical, unusually negative aura attached to PMS. Men are at a disadvantage because they we can't really grasp what it feels like and how much it might change one's behavior. Is there a good analog to help men understand this better? Thanks. A strange one. I will rather than speak specifically to PMS, which you know, different women experience so someone experienced incredible The huge mood swings and, and actual physiological changes as well. And I was lucky not to, not to be such a person. So rather than speak to PMS, as if I understand that explicitly, there is a simplicity to female hormones that men don't have. Right and, and actually, boy, getting back to the trans thing, this is something that I don't think if it just straight up patches that are being used, you're never going to get cyclicity if you are a male to female trans person, you're just going to have some stable amount that's always there. And that is very much different from living in the body of a, you know, anything from, you know, a 13 to 50 year old woman, you know, during during the reproductive years there, that this I mean, I think in this, this is really one of the big differences between between being male and female is, you know, part of why you guys make good, you know, long distance hunters and such as, like, at any moment, okay, we're doing it like, Oh, well, I was never mind I'm writing like, I'll just go do the thing, right. And it's not that there aren't reasons that you wouldn't be in your best shape and all of this, but there are many interlocking and counter dependent or interdependent, rather, hormonal cycles that are known, and therefore, presumably, many still that aren't known, that describe women's cycles that absolutely have effect on anatomy, physiology, and mood. And so rather than focusing specifically on PMS, just like actually, at different points in a woman's cycle, there are likely to be different amounts of creativity, of being quick to anger, of being, you know, interested in sex and being interested in nesting. I don't love that word. But all of these things are actually basically certain to be true and some people will reveal the simplicity less than others. But this that cyclicity in hormone is not really there. They may I don't think this is true, across like seasons for humans, like like with the migrating songbirds who should regrow pair upon landing. But because we have moved into an entirely a seasonal reproductive pattern, I don't think that there are there's much in the way of predictable cycling hormone levels for men. And therefore, if that's true, I think the answer is kind of like no like what would be the analog for some regularly cycling thing you can't consciously get at but there is something that's changing over time

**Bret** 27:57

March Madness. Oh, boy.

**Heather** 28:02

Okay, do you even know what sport that is?

**Bret** 28:05

Of course I know it's first that is basketball. Jeez, that was a masculine he was

**Heather** 28:10

just gonna say he's gonna say this is a masculine even though off air is really good. I know it's basketball, but you barely ever watched it.

**Bret** 28:18

I feel like I slammed onto that, but it's not bad. Um, yeah. So here's the thing. If we take the simplicity out of the question, right, is there an analog or something

**Heather** 28:28

to seasonal sports stuff, actually, but sorry, go ahead. But not endogenous, though.

**Bret** 28:33

Let's put it this way. fighter flight stuff would give a guy a sense of like, Oh yeah, that was some other part of my brain that probably but that's such a

**Heather** 28:45

rapid route, right? So it's a rapid honor so

**Bret** 28:48

it's just somewhere in the neighborhood. There is also post orgasm clarity, which is a widely discussed phenomenon. But anyway, the point is there's

**Heather** 29:05

a shorter shorter timescale but

**Bret** 29:07

again, the idea is if the parts of your brain in these two conditions if your brain does not look familiar to itself across some boundary like somebody said something to you in a bar and you're ready to break a chair of that

**Heather** 29:22

or you've ever been in love in that first week or two and then six months later and you still love it it's different right? right that the early love cocktail which is more about last and yeah, I don't even know what to mine Yeah.

**Bret** 29:38

And then trying to think there's an Arctic Monkeys lyric and I'm certain that we

**Heather** 29:45

are going to be actually talking about mechanics now. No, no no that in the Arctic No,

**Bret** 29:49

they're not shopping they're not Yeah, those are distinctly temperate. What is the

**Heather** 29:56

Arctic Monkeys lyric

**Bret** 29:57

there's an Arctic Monkeys there, but I can't quite I We'll remember at some moment when it's no longer relevant. Anyway, there's a Oh, has something to do with you couldn't behave that way on a Sunday night that it just wouldn't wouldn't make sense to behave that way on a Sunday.

**Heather** 30:20

Oh, I mean, that's, that's that's I don't know, I don't know the line. But, you know, we obviously impose cyclicity. Right in modality. Yeah. And the stereotype is that women are sort of better at grokking, what part of the week you're in, and whether or not it's a Monday, and therefore you have to do X. And it, it might actually be related to, to the fact that women live these cyclic lives for, you know, all of our reproductive lives without again, mostly being conscious of it at all. You know, it's been it's brought to consciousness on on certain occasions, but it's mostly just this background like, yeah, things are ebbing and flowing. And, and you kind of keep track if you know, things like you don't get pregnant.

**Bret** 31:05

Yeah, but yeah, I think that's the thing is that men have many analogues of one version or another few of them are cyclical,

**Heather** 31:11

and persistent. Right, right. Yeah.

**Bret** 31:15

Actually, the one that I think might be the strongest one I ever encountered, was, I'm speaking literally here. Profound thirst. Like when you really fucked up and you didn't bring enough water on some very long hike. That thing alters who you are so quickly and profoundly that anyway, I just think, if you can tap into something like that, and just recognize, like, wow, I was so thirsty, I wasn't myself. Right. Yeah, that that begins to get at the much more subtle but regular cyclicity and

**Heather** 31:58

yeah, because it's because the hormonal changes in in women's reproductive cycles are are cyclic. You know, all of that is myself herself. Whatever, right? Like there is no like, I wasn't myself, like, I was my best self. Maybe. Yeah, like, that's not the self. I wish I was always the self over here. And then sometimes I'm the self we all have that. But, but it's probably more reliably like okay, yeah, you know, day 18. Or what, I don't know what but, you know, a day is two and 18 are going to be around when I'm not at my best self mad. I just totally made up those numbers. But right.

**Bret** 32:34

One final thing I will say is that I did generate a hypothesis, one of my favorites actually, for PMS. And I taught it did was the one place where I got into trouble with classes. Right? There was something not everybody, but a small number of people almost reliably whenever I taught this to a class rebelled, not that there was anything wrong with my idea or that it didn't make sense, but they just it was you. Yeah, they did, because he rested the idea of a man. Even having a hypothesis about this. So

**Heather** 33:16

are you gonna share it? Are you gonna save it?

**Bret** 33:17

I'm definitely saving this one. In fact, it's it's one I'm looking forward to deploying with the right evidence and a proper context. Right? Yes, I do believe it needs an explanation and that there is one.

**Heather** 33:32

All right. Okay, let's actually get to today's question, shall we? Sure. All right. So given enough time in tech, wouldn't transsexualism trans racialism and trans speciesism become a virtual certainty and even the norm like how dyed hair is today seems like an engineering problem. masking is a social problem with people pushing acceptance before we even have the solution. Whereas if it could be done as safely, easily, cheaply, and reversibly is changing clothes, no one would care about it, and the abuse would go away. So the price, I want to leave trans racialism out of it. But transsexualism and trans speciesism are a denial of a true thing that has a deeper history with more complexity in it than anyone can possibly understand. And while it is true that if you dye your hair you're probably toxifying yourself and having effects at one level you've just changed the color of your hair and that's it and it is a simple parameter. There's a simple switch and maybe it's not a toggle but it's got you know, a few possible states and you can choose you know, any of one through six and sort of done. There may be downstream effects, but depending on what day you use, there certainly will be but they're they're minor all things considered. There is no such thing there is no dye. There is no hair dye analog for changing your sex. Although some would argue that that's the cross sex hormones, Nope, that's not sufficient. And there certainly is no equivalent for changing your species just not a thing. Just Just not not not not possible. So this this presumes that these are social problems, I think actually, and also misunderstands biology for engineering. Like we're not machines, we're complex evolved things that can't be manipulated by Miele pulling a few levers.

**Bret** 35:30

Yep. I will just add that years ago, Aubrey de Grey, I'm sure he still does. Aubrey de Grey, who is my antithesis. In the world of senescence research argued that curing senescence that is growing feeble with age that that was simply an engineering problem. And that, therefore, if we get to it, we'll beat it. And my point in response, and a long forgotten challenge over this was just because it's an engineering problem doesn't mean it's a tractable engineering problem. Right. And so I use the example of converting a, you know, 1967 Ford Mustang into an operable, you know, rocket that you could launch to the moon and return to the earth is an engineering problem. But it doesn't, you know, without ever taking it offline, right. It doesn't make it tractable. And so species transition, yes. Is it an engineering problem that you know, that you would have to change one creature into another creature at an atomic level? You know, I guess but

**Heather** 36:43

no, I mean, you can't even guess you know, you requires time travel? Yeah, well, you know, Spanish is about linear. And

**Bret** 36:49

if you did, right, you know, it's about lineage, but the fact is, you know, a squid has a organization of atoms and you could take the atoms from one creature and reorganize them into the other creature but the point is, you wouldn't get any of the things that you would hope to get out of that it's not like this creature that you disassembled would have the experience of that creature so you know even would have themes. It is it is the squid of themes. Yes,

**Heather** 37:14

reference that it will land with no one with

**Bret** 37:17

almost no one yes, Arnold. If you're out there, it's the squid leaves.

**Heather** 37:23

Without let's go on to the next question. Just a comment here, your interference during the fires was likely static due to a huge drop in humidity.

**Bret** 37:31

Lovely except we falsified that hypothesis. And the way we did that I thought you had was we humidified the hell out of the room with a steamer that we left left running and we can't put more water in it as we drove the humidity up well above what it would have been under normal circumstances

**Heather** 37:48

that's that was doing up here. Yeah, so long. Oh, yeah. I thought you were just covertly steaming a lot of clothes.

**Bret** 37:55

It does sound like me. But no, in this case, I was I was hypothesis testing that it was humidity because we actually thought that was the most likely explanation except it had no effect. So yeah, good thought. But nope.

**Heather** 38:09

Bret, if you're right about asymptomatic people not being contagious, do you think the infections are because too many decide not to isolate? I think asymptomatic spread is more likely to be the main cause. Why can't we have data on asymptomatic viral load. So there is I just saw an acquaintance just sent me a paper, I'm not gonna be able to find right now. Finding basically no evidence of asymptomatic spread in China in the early days in Wuhan and surrounding areas where they had gone they had done extreme lockdown for a couple of months. And then this is like, the population remembering on carefully maybe here but like a population of like 10 million people. For a span of 19 days, they tried to get as many people tested, it wasn't a PCR test, and I think anyway tested to see if they were positive or not. And they got like 92% of this 10 million person population. And they felt and and you know, some 30,000 of them or so hadn't tested positive for COVID before. of all these people there was there were none who were showing symptoms after this extreme lockdown early, right. And then 300 people or so show up as being asymptomatic but having COVID and they find zero evidence for any asymptomatic transfer. Now, this runs counter to the example I gave here, I think last week of a woman I know who experienced asymptomatic transfer in her place of business. Yep. But, but that that really big study is pretty powerful. And I'll try to pull it up, hopefully for another time.

**Bret** 39:50

Yep. A couple things that belong in the mix on this question one, I Angela Rasmussen point which That we mustn't mistake asymptomatic for pre symptomatic. So that's important. If you're going to develop symptoms, we need to classify you differently, because there'll be a point at which they're too subtle to trigger conscious awareness, you're headed there, too, it is impossible that there is no asymptomatic transmission at all. Because you will have people who are in denial about their symptoms and their symptoms, you know, some people will have a set of symptoms that can't be diagnosed from the outside. And so if you are in denial, I really don't want to have had COVID because of the stigma or whatever, no, I don't have to quarantine, of course, I can taste that. Right, right. So you'll get a certain amount that way, which is, you know, not really asymptomatic,

**Heather** 40:46

right. So that's not about the disease actually being transmissible when you're asymptomatic, that's about the social overlay of how people behave.

**Bret** 40:53

Exactly. And the last thing is, so first of all, the reason that we expect asymptomatic transmission to be very low is that what symptoms are, is the result of damage that happens to tissues and the process of creating more virus. So, for example, you and I have talked about the fact that sometimes if we, you know, end up giving each other a cold or something like that, that we will get the disease differently, right, you have particular symptoms, and I tend to have other symptoms, I tend to get it in the lungs, you tend to get it in the throat. That's right. And that this may, you know, there can be lots of reasons for that. But the basic point is your symptoms are a measure of where the lesions have happened that are putting out virus. And so in any case, you can have them in places where you're less innervated. And so the symptoms are much more subtle. But in general, all else being equal, we'd expect proportionality between your level of symptoms and your level of transmission. Because the point is, it's a measure of how much tissue is involved in producing viral particles. So anyway, all that is to say, you're not going to get a perfect black and white description of of how this works. But you will get a strong correlation when it does appear from that study, that asymptomatic transmission is at least pretty rare. Yep.

**Heather** 42:30

Next question. CRISPR editing of sperm to create gene edited babies. Is this possible? And is it a moral loophole to the editing of a fertilized egg? I don't know what that last part means. Exactly.

**Bret** 42:41

The distinction morally speaking between editing the sperm and the egg?

**Heather** 42:45

Yeah. Um, and, you know, is it possible? I don't think it's possible yet. But I think it's going to be possible.

**Bret** 42:54

Well, there's the question of technically possible and usefully possible, right? So, for example, we do know enough to I don't want to say we know enough, because it's possible that there's a link in that chain, we don't know. But the thing that I always say about CRISPR is that we have a typewriter. Now for genes, we can type any gene we want, right? de novo. But we don't have the Rosetta Stone, we don't speak gene. So there's a question about how, okay, congratulations, we're giving you this CRISPR device and a tech team and you're going to be able to edit your baby. It's a bit like somebody saying, you know, you have this, you know, here is a typewriter that types in Russian. And, you know, we would like you to edit Shakespeare, we want you to be the the Russian Shakespeare? And the answer is well, that's not sufficient. Yes, in theory, there's nothing you couldn't type on a Russian typewriter, including things the equivalent of what Shakespeare wrote, but a in terms of editing a baby's genome, you are up against natural selection, which has done an amazing job. And, you know, the selection process has edited down to the best of everything, right? with very few exceptions. And so the chances that you're going to beat that because you know, better, right is pretty damn low. But we just simply don't have the Rosetta Stone yet, which doesn't mean it isn't coming. Right. And this goes back to the discussion we had about the prediction of the protein folding that there may be a simpler rubric than we know. Oh, wait there with respected we don't speak gene.

**Heather** 44:45

Yep. Yep. Please help settle an argument is the thumb of finger my girlfriend insists that the thumb is not a finger and I insist that it is a finger we just call it a thumb. Everyone knows we have 10 fingers and 10 toes, right? Yes, it's a finger.

**Bret** 45:00

I knew you were gonna say that I know exactly what logic it's based on. I agree. But do you want to spell

**Heather** 45:06

it out further? Oh, no, there's no but I thought you could

**Bret** 45:09

also have disagree. No, no, I, I just I agree that this is a very straightforward answer. And yeah, leave so

**Heather** 45:18

well. Okay, maybe we, if we should be moving faster rather than slower, but

**Heather** 45:26

to the degree that thumb and finger are human made categories, you could argue that a hand is made up of a thumb and forefingers to the degree that these things on our hands that are digits are inherited from a most recent common ancestor. They are all digits. They're all made of phalanges, they all have comparable developmental trajectories and genes and coding for them. And yes, the thumb can can do this opposable thing with the pinky. But that's more about the attachment point down in the carpels, metacarpal. space, do the rest, then about anything different about the digits, so they're all all digits. They're all phalanges just like the toes are. But the one has a particular functionality. The others don't. On the other hand, you can do things with all of your fingers that you probably can't do with any of them.

**Bret** 46:24

So this is a nested set issue, right? Yes, fingers and toes are all digits. And thumb is a subset of finger, which is a subset of digit.

**Heather** 46:37

Yeah, that's what I mean. So and maybe maybe one more way to go at it is maybe only because of the naming convention because of the categories that we use. And I don't know if this is the same in every other language out there. But we don't call our biggest toe, not a toe, like no one is under the impression that there's like, a big toe and then four toes on a foot. It's like you have five toes and then some people say, Well, your thumb and forefingers. Well, that's only because we have lost the prehensile 80 word. Notice the pre hostility of our big toes. chimps have prehensile big toes. And you know they're they're climbers more than we are. You don't mean pretense. Oh, I'm sorry. prehensile. opposable sorry. Yeah. So I invented a word for entire the wrong context. I have to I have to retract that. Yeah, yeah. So we've lost the the posability of our big toes, because we're mostly walking on flatland. And it actually is, we have better grip, when we have flatter feet without a opposable big toe. And as such, because it looks more like the other digits. We don't give it a special name, we just give it like an adjective description to go with tau. And we could just as well have done the same thing with fingers. So this is just like it's a linguistic confusion because of the because of the naming categories. We've given it not. But the actual nested set is a big toe is a toe, a thumb is a finger and they're all digits.

**Bret** 48:00

Yep, I think that's right. And the number of puns that you could wield mercilessly in this challenge to your girlfriend is many and I suggest that you show no mercy because you were in fact, correct. That the thumb is a finger.

**Heather** 48:17

No mercy, none. Oh, well, okay. I'm supposed to start a master's degree in the United Kingdom starting in January 2021. I'm Canadian. Does the mutant virus pose enough threat that I should consider abandoning my scholarship? On happy face? pS best show ever. Thank you. Oh, boy.

**Bret** 48:38

I don't know what to think about this mutant. I don't either. I was having a discussion with the the group this morning on the Patreon call about this. And it is bewildering to me that we are being fed a nonsense story. We are clearly being fed in. Okay, there's a new virus has mutated. Yes, every hour of every day. It's mutating many, many places. This is a mutant so far. Okay, good. So now you've got a mutant that has changed enough and spread widely enough that we can recognize it as its own unique phenomenon. Good. Perfect. Should we be concerned? Yes, it's much more transmissible. Okay. 70% more transmissible? Did it borrow from somewhere in order to get there? Was there an inefficiency in the original? In which case? Why is it that with many hundreds of trillions of copies of this thing out there it hadn't discovered that earlier on and many times over?

**Heather** 49:38

Therefore, probably not that therefore probably it borrowed from somewhere else, or where to borrow from? Is it less awful in some other way,

**Bret** 49:45

right, or did it borrow from the lack of it? Imagine this we adapt to this thing. Over time our viewers will have registered that we were very concerned about fomite transmission at first And we got over that because it doesn't seem to be transmitted very frequently that way. That means you got a lot of people out there who aren't paying that much attention to surfaces. Right? Wouldn't that be a great way to increase your transmissibility, is to go some route? And that's readily plausible. So did it borrow from somewhere? And then the one that I really don't get is this variant. It's apparently four months old, that's been recognized for four months. That means this isn't the UK. There's no conceivable way given the UK was not quarantined in the UK was less quarantined than other countries because it allowed people to travel. Why are we not talking about how this variant is doing on? Presumably it is on every continent other than Antarctica? Yeah.

**Heather** 50:46

Whereas usually this question is insipid and meaningless. Why now? Like, why are we hearing about this? Now? Why is why is this showing up as a thing right now? If it has been described, for four months, right,

**Bret** 51:00

and I'm not saying it isn't a thing. I'm not saying it isn't 70% more transmissible, but I'm saying the immediate questions that should be generated upon that discovery does not seem to be discussed anywhere. Well, that I've seen yet and that has me wondering, what the heck is up?

**Heather** 51:19

So are you prepared to give advice on this one? Well, I don't I don't think I can.

**Bret** 51:26

All I can say is this. I think we, in general, most people underrate the danger of COVID because the case fatality rate is low death is not the thing to fear, but damage is the thing to fear. I think the idea that this is a UK phenomenon after four months of circulating with a very high transmissibility, I mean COVID is already highly transmissible to be, you know, substantially more transmissible means it has escaped, which I think means one of several things will be true, it will either do the same thing in the rest of the world that it has done in the UK, or there's something about the story that doesn't make any sense. So my guess is you can't really protect yourself from this variant by avoiding the UK that that's almost entirely going to be an artifact of the journalism here and not the virology or the epidemiology so you probably can't protect yourself from it that way. Should you be worried about a much more highly transmissible SARS COVID to Yeah, I would be

**Heather** 52:29

curious about your thoughts on Bitcoin or cryptocurrencies, more generally. I am 45 seconds,

**Bret** 52:36

I am a fan of the idea. I think a tremendous number of things are possible in the space. This solution to many of our problems, I am watching a awareness of the liberating liberating potential of these things, dawn on entities that would rather not be liberated. And so there's a question about whether or not crypto will endure the attempt to bring it into the larger finance, structure and set of laws. But I'm hopeful there's lots of stuff including preventing voting anomalies and fraud, freeing the internet from the censorious instinct of numbskulls with tech platforms, all sorts of stuff is possible there. So I'm hopeful, but we need to, you know, deal with the many demons that haunt the landscape between here and there. Yeah.

**Heather** 53:37

All right. Next question. Are you familiar with Arthur C. Clarke's three laws. When I hear you say things like tech can't save us or we'll never find a cure for cancer. So in essence, it reminds me of the first law, since won't recursive AI change that. So I just have to remember

**Bret** 53:51

I just looked it up is the first one any sufficiently sophisticated technology is indistinguishable from magic? No, no.

**Heather** 53:59

That's the third one. Oh, the so called laws are this is just Wikipedia when distinguished but elderly scientists states that something is possible, he is almost certainly right. When you say to something is impossible, he is very probably wrong. To the only way of discovering the limits of the possible is to venture a little way past them into the impossible. And three, any sufficiently advanced technology is indistinguishable from magic. So I will say I had not run into these before that I sense of Clark is that he was amazing. But that he had the same problem that almost all brilliant science fiction has, and pretty much all bad science fiction does, which is that he really, really well understood physics and other engineering likes some systems and really didn't get the biology and he did better than many. But you know, this is this is the point that I've made about the sci fi that that I have written is that you know, my my goal is to Yes, get the physics right. And that's not easy, but to also get the biology right, because no one seems to be doing that. And I feel like Clark's law here Specifically imagining that complex biological systems are engineering systems. And all you have to do is figure out why they're tractable. And you know, to your point about the typewriter with Russian, I mean, I feel like we've we've done this and you know, Clark just isn't going to end up being right. That every every problem is ultimately tractable.

**Bret** 55:18

Yeah, there's there's a tractability issue. But I also think, you know, I get the question, and I, I appreciate it. But you have to understand what it means to say that it's not possible. My claim would be the senescence problem is solved 100% and that the solution is about as perfect as you could hope for you just don't like it. And that's the

**Heather** 55:39

problem. It doesn't look like an answer to people, right? It looks like the problem.

**Bret** 55:43

The you know, the answer, the solution is to not solve the breakdown of the body as the result of the loss of information about the position of cells and things like that. But to redo the process by creating children and loading only that fraction of the software that makes sense into them to they are not burdened with the legacy code, yada, yada, yada. It's an incredibly elegant solution. Right? But when people say they want to cure senescence, what they're really saying is, I want a cure that preserves me, right? Yeah, that's what they want. And the answer is, well, that doesn't even really make sense. You're trying to solve a problem that isn't even coherent. Right? Do you really, would you like to save you for the world of 5000 years from now? Because my guess is you're going to be an old fogy, like nobody's business 5000 years from now, even if we did manage to preserve you. So wouldn't it be better if an updated version of you existed? So anyway, yeah. Many things are possible, they may not be possible in exactly the way we would like them to be possible. But that, that doesn't, that doesn't render intractable problems tractable.

**Heather** 56:59

So every question that came in this last hour is terrific. And I really would like to get through all of the move won't, but we'll pick up some of them. Next time. I'm going to get through a few more but happy Christmas hon. No, Happy Christmas, Hanukkah, Kwanzaa, Christmas Hanukkah as well. Yes. Do you too? Have you heard of the Great Barrington declaration? If so, what are your thoughts on their public policy proposals? Thanks for your work this year, it has kept me sane through all the chaos. Thank you for that. We've been asked this a lot. And I have gone and dipped into it a little bit and just have not I just, I just don't know enough to say,

**Bret** 57:39

Yeah, I don't Yeah, I'm not even sure what it's the reference to,

**Heather** 57:42

oh, it's, it's a rejection of most of the societal level response to COVID. By public health officials, I think if I'm, if I'm remembering correctly, there are a number of these there's, you know, there's also the great reset thing. And this is this is sort of the opposite in some ways. But we obviously don't know enough to say a lot about it right now. Hi, both, please explain and riff on the beautiful evolutionary, concurrent, concurrent, I think convergence of the hummingbird and the hummingbird Hawkmoth both adapt for hovering nectar extraction. Are there other examples of close evolutionary adaptation? Love you too?

**Bret** 58:22

Yeah. Perfect. So beautiful that so Hawk models are stringent mas are these very high energy highly agile? Mas that are I think, all nectar fueled? If I'm right, Heather's gonna bring up a an image of one. Yeah, so these sort of fighter jet looking creatures. And it of course, it makes perfect sense. That's a beautiful one. Yeah, it makes perfect sense for their behavior to be similar to that of hummingbirds because, of course, they're solving a similar ecological problem. But you set us up perfectly to reveal the third one. That's right, right. The third one is that there are bats that do the very same thing as hummingbirds. I call them humming bats. I'm not sure anyone else does, but they should. They should. And they're, they're very Hummingbird like they hover in a similar way. I once took a photograph I got one photograph that's anywhere near decent. I was

**Heather** 59:25

at what's the judge the genus of

**Bret** 59:26

Safa. esophagus, Sora. Center. How am I remembering that correctly? So anyway, these are bats that pollinate flowers out there, so yeah, that's a good. That's gonna be Merlin Tuttle. Of course. Yeah. Merlin Tuttle, the great bat photographer, who also is the founder of bat Conservation International. Merlyn, if you're out there, good to see you. Yeah, it's a very worthy organization. But in any case, these bats

**Heather** 1:00:02

That's bananas.

**Bret** 1:00:04

Yeah, sure is going after bananas. Yes, in fact, Nana's are often protected from the claw marks that bats would put in them which are taken to be off putting by consumers and so bad banana farms often protect their, their fruits from from roosting marks. But anyway, the point is back to do the same thing and what? Why am I forgetting Marcos last name. So I studied briefly, I was helping out a guy, Atlas Silva, who became a very important bat researcher

**Heather** 1:00:41

solva being one of the big Neo tropical research stations in Costa Rica and

**Bret** 1:00:46

Sarah piggy region of Costa Rica, Marco, I'm kicking myself that I've misplaced his last name for the moment. But anyway, Marco was studying glyphs of a gene, these humming bats. And he was netting them to figure out what their behavior looked like. And what he was discovering was that their behavior looks exactly like hummingbirds and right down to the trap lining. So if you think about the, the puzzle, if you're a plant, and you're trying to get a bird or a bat, to take your pollen to other members of your species, because that's in essence, the whole point of the putting out a flower, then you don't want to give the creature so much reward that it just hangs out at that flower and drinks all night, because that's pointless. And you don't want to give it so little reward that it doesn't come to visit your flower and it goes to some other flowers. So there's this game theory that plays out between the flowers. And the animals that results in the animals trap lining. So they make a predictable, because they're very expensive to run, I mean, an animal that is fluttering like that, is spending a lot of resource. So the animal picks the best path through some series of plants that it's visiting whatever plants happen to be flowering. And basically, it gets very good at running the trap line and trap line being an analogy to old trappers would put out traps and they would visit them to see if they'd caught anything. So anyway, both hummingbirds and having that and I believe spinward mas do this trap lining thing, because it's the most sensible way to solve the problem of being pushed to the next flower by a plant that wants to feed you enough to get you to come back, but not so much that you stick around. So anyway, it's a very nifty set of systems and yes, a whole lot of convergent evolution.

**Heather** 1:02:33

Isn't nature wonderful? Yes, it is. I'm not a PhD. But I've recently carried out a study on birds that turned up significant results, should I try to publish an academic paper? Also, I do research art and blog. Sometimes I still stumble into a situation where I can actually contribute to a field of study. Thanks for everything.

**Bret** 1:02:53

That's cool. I

**Heather** 1:02:53

love this.

**Bret** 1:02:59

Here's what I would do. I would say yes, you shouldn't try. But if they shut you down,

**Heather** 1:03:03

which they probably will, then that's what they I mean, they're literally gatekeepers. Yep. Yeah. If they

**Bret** 1:03:09

shut you down, then take it public. Yeah, just reveal what you've discovered, you're, you're entitled to do science. And if you discovered something cool, that's awesome. And give us a pointer to it. If you found something cool. And you want to make a little video that explains your findings and your methods and those sorts of things. We'd love to look at it. And you know, that can't stop you from talking about it in public. Yeah,

**Heather** 1:03:32

and, you know, like the the gatekeeping you without a, an institutional affiliation, presumably would not be able to get grant money on your own. But those particular gates do not exist with regard to publishing, it's going to be harder to get taken seriously, you may just get rejections without ever knowing why because they already saw that you don't have those letters after your name, and therefore they don't even read what you've written. But, you know, depending you haven't said anything about what kind of a study it is, you know, ecological, behavioral, physiological what, but depending at least, you know, if it's over in sort of organismal, biology, natural history space, there are a lot of birds specific journals that do that will publish smaller pieces, even if they're big pieces of research, but from people who they might not necessarily always publish. So that's that's a possible way in possible

**Bret** 1:04:29

although there is an awful lot of gatekeeping even the archive, which shouldn't have any requires an institutional affiliation to gain access to it.

**Heather** 1:04:38

Really, yeah. Do you mean to get Do you get to put yourself on

**Bret** 1:04:41

things? That was certainly true A few years ago, I don't know that it's still true, but I assume it is.

**Heather** 1:04:47

That's really unfortunate. Okay, so like I said, there's so many good questions here, but we're going to switch to the next hours questions so we can get through a few of them. Keep America weird all caps keep America Western education, no educated, industrialized, rich and democratic. Yeah, let's, that's how I think. I was wondering if you could describe the importance of evolutionary medicine and where to learn about it to someone who will start med school next year?

**Bret** 1:05:17

Oh, goodness. Well, we hope we're not messing you up. The key to integrating evolutionary medicine into your study of medicine and medical school, we'll be keeping your mouth shut when necessary. You're looking at me

**Heather** 1:05:32

that way. It's just not helpful advice right here.

**Bret** 1:05:35

I believe it to be literal advice that I don't want to have to give. But the problem is because medicine and psychology and ophthalmology and dentistry are all taught as if we didn't know anything about Darwinism. There is resistance to this. And so evolutionary medicine to the extent it exists is not a medical program. It's outside. It's an evolutionary program.

**Heather** 1:05:56

True, but that's a political response rather than a How do I learn about it, right? Like, where can this person learn,

**Bret** 1:06:03

say two things. George Williams and Randy Nessie wrote an excellent book, which is basically the founding text of this discipline. It's called why we get sick. It's

**Heather** 1:06:15

still the classic, even though it's now 30 years old, a little less than 30 years old, in the early 90s.

**Bret** 1:06:22

Incidentally, on the back cover, I think it has a blurb from Richard Dawkins, who says, Get two copies and give one to your doctor. Yeah, which I did. cost a little bit of consternation. So anyway, that's the long and short of it. But George Williams, sadly is gone. Randy Nessie is very much not gone, and is now the head of animportant, maybe the important evolutionary Medicine Institute. And no doubt, if you look up the Institute, you will find pointers to the most important journals, blogs, etc.

**Heather** 1:07:08

This book is also something that I recommend highly the story of the human body by Daniel Lieberman serve the human body subtitle of which is evolution, health and disease. It's, it's more modern, so it's a little bit more up to date with regard to just a few things that we have learned. Since it's not, I guess, it just it's telling me that I purchased the item in August of 2014. So it's not brand new. And then, boy, there's another as an article just out here, I'm going to ask the next question. And then have you answered while I look for this article, see if I can find it, because someone who's going to med school should well be able to understand a primary article on on let me just find it and and see if it's relevant. Next question. Why is there more competition in the tropics, less seasonality reliable resources, as competition also increased between humans and hothouse conditions? If so, which wouldn't? The above decrease competition, and that from our friend eco? All right. Go for it. Well, I've tried to find this.

**Bret** 1:08:14

Yeah, let's just say. So this was one of the primary topics in my my dissertation. And the counterintuitive thing is that the temperate zones, which are less competitive, are more difficult to evolve in response to because of their capriciousness. So that is to say, the weather doesn't care about you, right? That means some days it smiles on you. And some days it delivers you harsh challenges. And predicting them is difficult, because it is not something that has an interest, your competitors have an interest, whether it is getting to lunch before you do, or poisoning you so that you disappear from the landscape or whatever. But that force that they apply, is consistent enough that you can adapt to it. And so, in some sense, the argument that I deployed in my dissertation for why species are more numerous in the tropics, and that is true at every scale is that, in effect, the competitors drive each other to ever greater competitive, ever greater competitive efficiency. And at the cost of competitive efficiency is the narrowness of niche which means that a species that was broadly distributed and had broad tolerances gets narrowly distributed and divided up in order to be a more ferocious competitor. So it is a downstream consequence of conditions being more consistent over time, and that leaving competition as the dominant hostile force rather than a flip flop, between competition on the one on hand, and climate on the avenue

**Heather** 1:10:04

awesome. That was a super packed synopsis. It was, it was pretty dense, very good, very good. Just to go back for a moment to the person who's entering med school next year so we have a couple of chapters in our book which will be out middle of next year ish middle to the end of next year on medicine and health from evolutionary perspective. But there's this articles you can show. The co author is the same Daniel Lieberman who wrote the story of the human bodies This is Gervin, and Lieberman just published this year 2020, called weird bodies, mismatch medicine and missing diversity. So if you've got a higher ed affiliation, you should be able to find this article. It's published an evolution of human behavior. And it's also a really good introduction to some parts of evolutionary medicine.

**Bret** 1:10:57

Yeah, maybe also a pointer to Paul he Wald

**Heather** 1:11:03

Yeah, parcel I, I would I don't remember what of his though. So I wouldn't know what what to

**Bret** 1:11:09

do. I don't offhand either. Maybe we'll come back to

**Heather** 1:11:13

but I'm just not I don't know what we're call well enough to know for sure if that's going to be relevant. Just a quick question of the Alpine country of Austria. Do you know of any higher mutation rates caused by epigenetic changes?

**Bret** 1:11:26

Or mutation rates caused by epigenetic changes? There will certainly be higher mutation rates epigenetically influenced based on things like histone wrapping, which will expose DNA to greater or lesser interactions with the environment. But I'm not quite sure.

**Heather** 1:11:49

I'm not sure if Alpine is relevant to the question. Yeah, I'm not and if we're talking about humans, or virus or some other or just across the board.

**Bret** 1:11:58

I don't know either. Yeah. So the certainly implausible, but whether it's relevant to what you're looking for, we don't know. Yeah,

**Heather** 1:12:06

I agree. Core and solar forcing, in quotes, core and solar forcing or taking grip and climate science, sun influences, clouds and core materials. North Pole is moving to Siberia. This is a coincidence. I don't know what to make of this.

**Bret** 1:12:25

I remember something about solar forcing. I don't thought everything was involved in the milankovitch albedo feedbacks, but I don't remember

**Heather** 1:12:39

certainly the sun influencing clouds and such sounds like an albedo reference but and you know, North Pole moving could affect milankovitch cycles. I don't I don't know enough about what's going on

**Bret** 1:12:51

here. The North Pole moving as a strange construction.

**Heather** 1:12:56

You know, as the tilt changes, the magnetic and the true north are going to be slightly differently. aligned. Right. So you know, we're moving between, we're right in the middle right now. So we've got like a 23.5 degree tilt right now we move between something like a 22 and a half to a 24. Did the wrong way. 22 and a half to 24.

**Bret** 1:13:14

Yeah, but it's so tiny. It doesn't move the North Pole to Siberia.

**Heather** 1:13:17

Yeah, I try. I'm trying to imagine like, what? So close to Siberia to the North Pole? I don't I don't know. No, I mean, this is the Arctic Ocean. Yeah. So yeah.

**Bret** 1:13:27

So I'm not sure if there's something metaphorical in that claim, yeah. Or not. Anyway, yeah, I wish I knew, because that's a very interesting set of feedbacks. But

**Heather** 1:13:40

indeed, Brett, the last circumcision questions seem to be about choice. It can pass the Adaptive Test. But why make the choice for the baby instead of letting them decide when they're older? The son can weigh his pros and cons and choose. This is going to be the thing that just keeps on coming

**Bret** 1:14:00

back. I guess it is, yeah, I had a friend who was I think he was re circumcised for religious reasons, late in life, and it was very traumatic. So in some, in some ways, I think this is about not traumatizing. You know, yes. It's probably traumatic for the baby. And they're probably over a minute or two later. So, anyway, I mean, I don't know what to tell you. I do. I do think people make more of this issue than than they should. And, you know, we've given the part of it that I think we're specially qualified to talk about which is for skin passes, the adaptive tests, the removal passes the Adaptive Test. We can't say very much about the whys, and that does seem to make it defensible. Either way.

**Heather** 1:15:02

Next question, what sorts of mutations would best support differential success in modern times? for males? for females? I'd like to better understand the selection criteria. I think this is too blunt a, a tool. Yeah, I guess the idea here is that any evolutionary change in humans are going to be genetic mutations. Yeah. And of course, the vast majority of evolutionary change that we're experiencing now is not at the genetic level.

**Bret** 1:15:32

I agree. I think, you know, you're part of the species that has the greatest opportunity to be flexible, and to innovate and all of that, and it hasn't, you know, it was set in motion by genes that created a brain that was very much not genetically pre wired, which isn't to say 0%, but it's to say less than any other species. And so that's the answer is, you know, what makes you better able better prepared is flexibility, which you have in spades.

**Heather** 1:16:03

Yep. Okay, let's just go let's do four more, a couple of which are very brief, because they're just comments. Should humanity commit to slowing the Earth's orbital speed until we achieve a 360? day year? Yes, absolutely. 100%.

**Bret** 1:16:19

And we should get right on it. Yeah. Yeah,

**Heather** 1:16:23

I would make things simpler. The math would just be so much easier. Yeah. It was so much more elegant. I mean, we're so close. We're so close. Or we could pray. God is definitely pumping us.

**Bret** 1:16:34

Yes. He is. punking. us and we should pray for him to stop. What it says reasonable approach as any Yeah. Sadly, very few side effects. What side effects there are might even be positive.

**Heather** 1:16:48

I imagine 90 day seasons. Perfect. Yeah, obvious. Totally. Yeah. Thank you for that. Why not just designate saunas, bathrooms and changing rooms by genitalia? Could anyone game that?

**Bret** 1:17:06

I don't want to have to check.

**Heather** 1:17:07

Yeah, that mean, that was certainly by first, you know, saunas and change. Yeah, whose job is to check? Yeah, I mean, tiny, tiny, tiny number of people who have ambiguous genitalia who are actually intersex? Yeah, but I mean, it's not operationalizing, it would be tough because he was gonna check. But it's, it's not terrible. Here's

**Bret** 1:17:34

the thing. I mean, in some sense, it's it's a reinvention of exactly what this person is suggesting. But this whole idea that this is all about symmetry, it's actually about asymmetry, right? You've got people who are in need of protection. And it occurred to me after our stream ended that it's not just that males are bigger on average, or that pregnancy is a disproportionate cost for females. But anatomically, males are built in a way that they can force themselves on females and the reverse is much, much less plausible. Right? Those three things basically answer the question of who it is that needs to be protected. How we do that? I don't know. But at some level, let's not overcomplicate it. That's the point. And to the extent that your new fangled rubric violates the principle of we should protect those who are most in need of being protected. It's a bad it's a non starter. Yeah, from my perspective.

**Heather** 1:18:33

The penultimate question here is meow.

**Bret** 1:18:37

Yes, definitely. Yep. For sure.

**Heather** 1:18:39

And finally, can you share your philosophy on when to listen to experts? How should we navigate disagreements from experts in the same field or between different fields? What are common blind spots for experts?

**Bret** 1:18:53

Yeah. I would say yeah, it's not as simple as when to listen to, you

**Heather** 1:19:00

know what, there's actually another experts questions. So let me just read that one. Okay, as well. So that was trying to lump these together. Are we living in the age of experts, or in the age of socially driven content? Why do you find one or the other more preferential? And I think that's a complete solution set. I would help. Yeah,

**Bret** 1:19:19

I think there's a we've got a, an expertise problem, which is that our experts very frequently aren't expert. Right. And so there are many cases you would want to listen to experts on Coronavirus. But our experts suck, they're corrupt. And so because they're corrupt, you can't afford

**Heather** 1:19:39

or, or too narrowly trained. So they don't know what they think they know.

**Bret** 1:19:44

Let's put it this way. I think that's a problem. We get narrow training. We've got you know, biases and the types of error that we prefer. These biases are themselves corrupt because we don't want to disrupt certain kinds of business. Even if It causes us to massively disrupt others. And in some sense you have to go with the individual is trustworthy. And one of the things that the individual being trustworthy is about is do they tell you what the limits of their knowledge are? Or tell you how they would know if this was wrong, right? To the extent that some expert wants to assure you have the right answer. So you can turn off your brain? There probably no good. And I'm trying remember what the example was. You and I got something? Oh, I got something wrong. A couple of livestreams. ago, it was said about Hannah, just a second ago, it was about Oh, yeah, adaptive immunity. And vertebrate, he was about how far back adaptive immunity went. And the reason I'm highlighting this is, yep, I'm an expert in biology. I got this biological thing wrong. But if you look at the conversation that surrounded it, I told you where I suspected my logic was probably going to offend me. And I gave you the things that pointed in the direction of the other answer, right. And the point is, that's what you want is somebody who's willing to show their work enough that at the point, they do get it wrong a they'll say so be, you'll see how they got there, see, you can figure out what the consequence of the error will be. In other words, that's what show your work is for? Yeah, show your work is so that you can evaluate all of those things. And to the extent look, you may be in a different position than I am. And it may be that although I think this is the right answer, if I show my work, then you can say even if that is probably the right answer, the risk of the other answer is so substantial, I'm going to hedge against it. So anyway, yeah, somebody will show their work is Yeah, what you're looking for.

**Heather** 1:21:47

So in terms of navigating disagreements, you know, too often, you know, especially if it's talking heads, it's mainstream media and you get, you know, 30 seconds to three minutes most to explain a point there's no, there's no tolerance built in for any kind of explanation, nuance hedging, any of that, and, you know, hedging in this case, I mean, entirely positively saying, you know, okay, I think this, but these are the things that would, that would cause me to have to rethink that conclusion, like you, you want to, you want evidence that anyone is who you might listen to, has both the capacity to do that sort of analysis, and does it on the regular, and also, and, you know, this is going to be tougher to be revealed, we'll, we'll come back and correct the record, if they turn out to have been wrong about something substantive, not, you know, every single little, little error, but you know, anything big, they'll come back, they'll make an effort. You know, just just like newspapers do, or claim to write like, they publish corrections like this, this is what you must do. If you are speaking with, you know, with the ability to change how people behave, and therefore, what outcomes will happen. You absolutely need to be responsible to your own reputation, because you're responsible for other people's choices and lives. Yep.

**Bret** 1:23:05

Last thing I would say is biggest red flag might be that there's a bigger red flag, but as for the moment, I think the biggest red flag for me is appeals to authority, especially somebody is appeal to their own authority. Right? In other words, if somebody wants to waive their degree in front of your face as evidence that they know what they're talking about, they probably don't, right. That's one of the

**Heather** 1:23:27

thing man, if I know a lot of dumb PhDs, a lot of MBAs so damn, we know, so lazy, so incompetent,

**Bret** 1:23:33

wreck the meaning of the degree by giving them out, rather than paying people to do the work of the university. So it's not to say that it's not relevant that somebody has one, right or that somebody has it in their signature file as I think I do at this point. But the point is, does it stand in for an actual argument? Right, well, somebody wield their PhD because they don't have an argument. Right? rather than it being just you know, who is making the argument? Yeah, okay. They have a degree in such and such a thing, right? It tells you something about what

**Heather** 1:24:03

they're doing allows you a first pass like okay, then you know, that maybe maybe they have thought deeply about this thing. Yep. on which they are now speaking. Yeah.

**Bret** 1:24:11

But somebody who pulls rank just based on degrees or institutions or whatever it is, is almost certainly covering for something.

**Heather** 1:24:20

Yeah. I there's there's a lot more to say here, but I'm sure we will come back to the question of expertise and authority and what it actually means to have a degree in a relevant field or what a relevant field might be. But I guess one more thing, you know, as much as a PhD in science, for you know, for academics, is often trotted out by people saying well, you know, I my PhD is in science, therefore, is sort of your Trumps yours, you know, there is this hierarchy, usually implicit, but sometimes even explicit within, you know, between academic fields, but unfortunately, many, many, many So called scientists Now many people who have PhDs in the sciences are actually doing science. And if asked couldn't really describe to you what science is they describe the results of some scientific method that, you know, the actual products, the outcome, which is not the science. That's the results of the science. And the fact that people who are claiming to be scientists can't tell you what sciences should be a big red flag.

**Bret** 1:25:23

Yeah, I agree. Yeah. If they're uninterested in the process and how it's sensitive to certain kinds of, of error, then they're probably not very good

**Heather** 1:25:34

at or as one so called scientist who I want to talk with announced to our class. Well, I used to think that hypotheses were important, but now I know better.

**Bret** 1:25:45

Yep. Yeah. Yep. My hypothesis is that he was overpaid.

**Heather** 1:25:49

Hmm. Indeed, yes. All right. I think that brings us to the end of another q&a episode.

**Bret** 1:25:58

How did we get here?

**Heather** 1:25:59

How did we get here? Well, we will be doing another q&a episode tomorrow, only for our Patreon members at my patreon from 11am. Pacific to 1pm. Enjoy my patreon to get access to that next Saturday and Sunday, you're going to be having your two hour, much more intimate conversations on the reasonable

**Bret** 1:26:17

on Saturday and evolutionary discussion on Sunday. I'm changing up the mechanism by which I'm alerting people to these things because of the hiccup a couple weeks ago, which we addressed this morning. But I will make a standard Patreon announcement to the tyrian. That's how you'll get it rather than through the messages.

**Heather** 1:26:39

As opposed to as a Patreon post. Yep, yep. All right. And yeah, like that. We will be back in the new year. It'll probably be next week, but there's some big chance that we will take a take a one week break, but we'll certainly be back in the new year. We'll be back

**Bret** 1:26:54

in the new year if there is a new year now. Wow. All right. I don't know but just to be safe. It seems like we need a copy out like that.

**Heather** 1:27:05

If we need to be safe like that. We're never getting off camera.

**Bret** 1:27:10

Right? Well, we will settle this back to you very probably in the very probably here to tell you how this argument played out. Oh, that should be fun. All right. Well, everyone