Your Questions Answered - Bret and Heather 16th DarkHorse Po...

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**SUMMARY KEYWORDS**

question, people, consciousness, females, virus, soil, popper, values, homeopathy, lockdown, true, find, fact, male orgasm, mosquito, answer, gatekeepers, part, students, evolve

**SPEAKERS**

Bret, Heather

**Bret** 00:11

Hey folks, welcome back to the Dark Horse podcast, our 16th live stream, the Q and A section where we will answer as many of your super chat questions as we can get to. So

**Heather** 00:23

we had a glitch in the downloading of the questions this time. And so during the break, Zack and I were working furiously to collect them, but it is possible that we missed some and we never get to all of them. But he, we tried to get all of the ones above a certain dollar level. Apologies if we missed it, if you would email the Dark Horse moderator, which I think is at Dark Horse dot moderator@gmail.com.

**Bret** 00:52

I'm not I got that right now.

**Heather** 00:55

With your question, if, if at the end of this, we didn't get to it, we will prioritize if it was above a certain level. We'll prioritize it for next time.

**Bret** 01:03

Yes. And from the perspective of preventing this collapse on future live streams, please, when you upload questions, make sure the filaments in the wire have been tightly twisted together and don't let the pressure get above 30 psi. Thank you.

**Heather** 01:18

psi. Okay, Cliff high with a large a large donation. Thank you, Cliff says consider personal consciousness. Where in the body Do you understand it to be bound? Where do you feel it to be bound? Or where do you think it to be bound? I know, but what your thoughts? Are these informed by psychedelic experience? Do you know the biological mechanism of the binding?

**Bret** 01:46

Well, I thought I understood the question until the last question in the sequence.

**Heather** 01:54

The question with regard to the biological mechanism of the bio,

**Bret** 01:57

the binding of the binding seems like something very precise, and it could refer to the binding of the neurotransmitter mimic in a psychedelic entheogen. But I don't know if that's what it's getting it? I would say,

**Heather** 02:12

Well, I think the question is informed by psychedelic experience, that's one thing I think is true, you

**Bret** 02:17

think it's immediately informed by psychedelics

**Heather** 02:19

seems quite, quite clear headed. I think, although I'm not sure. I think there's a premise here that we might disagree with, if I could quite understand what the premise is, but I'm not sure I know what it is.

**Bret** 02:31

Yeah, I suspect that much to the annoyance of all sorts of people, that consciousness, individual consciousness is a feature of the mind, the mind being what the brain does, and therefore were in the brain. Does that mean that there's nothing to thinking about it in any other way? Probably not. But yeah, from the perspective of what kinds of damage you might get that would interfere with your consciousness, I suspect it is localized in that way.

**Heather** 03:04

And it would say localized and with ever less strength, potentially, the less dense you are with regard to nerves. So you know, the CNS, the central nervous system, which includes not just the brain, but the spinal cord, might be the the core area, and there are things that the motor neurons and sensory neurons may be doing and the inter neurons that could be transmitting aspects of consciousness that we don't understand.

**Bret** 03:37

I'm not going to ask you how dense you think I am with neurons or anything else. But I will say for cliff and anybody else who's interested in our thinking on consciousness, what we have argued is that individual consciousness is a secondary adaptation that follows from the consciousness that exists between individuals and consciousness that exists between individuals is not localized in the same way in the mind, that's where the model would take place. But the fact that it is an emergent property between two people means that it is in effect not localized in the same sense. So I don't know if that answers your question, Cliff, but I, I hope it shed some light.

**Heather** 04:18

All right. Next question. Do you think that truth scales, if so might the prince with what's written is lossless hierarchy? I think he is referring to Maslow's hierarchy of needs, distinguishing noble and common needs, or people be a good barometer for one to govern oneself. And like Peterson's 12 rules be a rubric for government to follow in governing a population. Nate, who also donated a fair bit has packed a lot into this question. Let me just say it again. So that it's, I think there's three questions. There's, there's a question and two possible answers here. Do you think truth scales? If we think the answer is yes, Nate posits that Up to the prince, which is Machiavelli's famous book, in which the noble versus the common descriptor that Machiavelli uses might be mapped onto ladislas. Maslow's hierarchy of needs be a good barometer for self governance? And might Peterson's 12 rules be a good model for government governance? That's how I understand the question. But it's there's a lot more to be unpacked there.

**Bret** 05:27

Some truth scale, at least to some extent, to any truth scale infinitely hard to say. I'm concerned about anything like trying to take something like the prince. And yes, it might be better if your Machiavellian tendencies unfolded internal to you as an individual, it's probably a closer approximation of something decent. But the problem is, you might well ended up deferring to some entirely symmetric view of life where you effectively took that as a license for hedonism, which I don't think is a very good use of a life. So no, I wouldn't advocate it as a principle. Maybe the harm you do is to yourself rather than to others, so it's not so onerous. But But anyway, I'm not sure about it. And that doesn't strike me that Peterson's 12 rules are scaled properly. For for the governance of populations. I don't think it's their intent.

**Heather** 06:31

He I think, quite precisely my, I've read the book, and I found it quite excellent. But it is specifically about how individuals should act, I feel like it is it is far better in that first position of a good barometer for how to govern oneself, or at least how to start governing oneself before you figure out how you may be different from your neighbors. But that it doesn't seem really to be a rubric for a population level analysis. And I think I think you would agree with that, although I'd be curious to have that conversation. I suspect it. And then with regard to the first part of the question, which you already addressed, you think truth scales, I would say maybe that patterns and ideas may scale. So you know, selection, for instance, natural selection exists at all of these different levels and across domains, even in non biological domains. And so that is a kind of scaling. Whereas, you know, it depends on what kind of truth we're talking about. And that sounds like a wishy washy, trying to get out of the question, but some truths will scale, maybe never infinitely. But some truths are completely hyper local to the space and time in which they exist.

**Bret** 07:43

Yeah, I mean, I think you've done a good job of nailing the most likely candidate, which would be that the things that accumulate in the universe will be patterns that come into existence, frequently, that are similar to each other when they do. So they're recognized as a category that are durable upon arrival, and that capture limited substances or other properties of the universe, such that they effectively out compete other things that might contain them. So that's a, that's the underlying substrata, on which Darwinism floats. And it applies to all sorts of things that have nothing to do with biology. And so if we just apply it to patterns, yes, that's the most likely thing to apply at every scale in the universe. But then again, what do we do? You know, it tops out at the universe? I think, maybe not. All right.

**Heather** 08:43

All right. Next question. From Raphael, with gatekeeping. in academia and the crisis happening together, how do and the current pandemic crisis, presumably how to graduate students live and participate? What to do if advisors are gatekeepers? advice, if you can't find positions because of gatekeepers in theoretical parts of science and math? Oh, man, this is a good and clearly heartfelt and difficult question. I think

**Bret** 09:09

the best we can do is probably we feel for you. And it's a really terrible situation, but the way limited resources are allocated, and science puts people in charge, many of whom are not worthy of that kind of responsibility. And we've seen it up close. And many people who might steer us in a much better direction if they were liberated to do so are constrained by the fact that they are effectively forced to fall on their swords if they go in a direction that does not please the hierarchy above them. So this is a puzzle that needs solving and there's nothing riding on it, but the game

**Heather** 09:51

yeah, very much. So I guess we can talk about this a little bit, a little bit more. This doesn't get so much to how you find positions after you've gotten a degree. How do you find positions in academia after you've gotten a degree, which is its own set of problems. But when you're actually in graduate school, and if you have an ability to choose between advisors and see that some seem to be more of the gatekeeping type, and some less, you can imagine that it's actually, it would make a lot of sense from a self interest position to be a gatekeeper as an academic. And in fact, whole departments tend to be of this sort of gatekeeping mindset or not. And even in those departments that allow graduate students more freedom to choose their own questions, as opposed to slot into a space on the lab and ask questions is handed to you. Even in those departments that tend towards the more freedom for graduate students to ask the questions and, you know, sink or swim, which is certainly the the way that Michigan's biology department was when we were there. Even there, you'll find some of the would be advisor, some of the faculty being more gatekeeping. And so, really finding a place where, you know, choosing an advisor, who has students who are asking all range of questions, who engages in conversation in which disagreement happens, and in which the entire lab is not dependent on one or two or a longitudinal strain of large grants, which are going to you basically you're going to get a reversion to the mean, you're going to get more and more orthodoxy. If you're reliant on the big money coming in from the government grants that require the same kinds of results as have always been coming in. So you know, find someone who is doing more eclectic, heterodox research, but of course, those people themselves are becoming harder and harder to find, you know, we both all three of the advisors whom we had who you mentioned in the last hour, Bob rivers, Duke, Alexander and Arnold cloggy, were all of those things they were they were heterodox and encouraging. You know, they, they wouldn't, none of them ever would have wanted students to simply slot into their own research, they would have found that absurd and anathema. And yet it is the common thing for graduate advisors, especially at least in many aspects of STEM. I know less about the other parts of the Academy.

**Bret** 12:14

Yeah, one thing you could do is you could consider cryogenics you could have yourself frozen and then see if it's any better and 100 years.

**Heather** 12:24

You're drinking alcohol No,

**Bret** 12:25

no not drinking anything.

**Heather** 12:26

I can't tell you picked it picked a

**Bret** 12:28

nice glass they brought out the darkness in my mood. What happened?

**Heather** 12:34

Next question, could very different or mildly different bat Coronavirus variants evolve in different bat species? For instance, ranallo food sources tarapoto kids who live in the same ecosystem rk Of

**Bret** 12:48

course, the very fact that you asked the question means you must understand the basis on which it would happen. You know, there's always a question about what the gap between species means about the likelihood of it finding its way across. But

**Heather** 13:05

yeah, so Brenda Lovins versus tarapoto is is a pretty big gap. It's kind of as big a gap as you get within bats. So this

**Bret** 13:11

is the the I believe the expected distance between these two has shrunk on the basis that Ryan olefins have been moved towards tarapoto. Yeah, actually. Yeah, not as far as it would seem. But as far as it would seem, given that Ryan elephants are what we call micro bats and tarapoto or mega bats.

**Heather** 13:30

That new framing that being tow versus the mtow versus yanga copter, I don't remember what the prefixes are they've used but now Yeah, they've got the rent a little bit and the tariff codes, which are the big fruit bats in the same group. So yes, they, those people

**Bret** 13:44

who do that follow Jack's the bat gatekeepers,

**Heather** 13:47

the bat phylogenetic gatekeepers now. Is there an evolutionary reason of why women have the ability to achieve multiple orgasms? Thank you. I like to go after this one.

**Bret** 14:02

Sure. Of course, there's, of course there's

**Heather** 14:05

been but that's that's but then what? Well, yes, there is. And it's complex. And it's iterated, and there's variation in how much people experience it. This is

**Bret** 14:16

not my first time at the rodeo, I must tell you, do you remember when we were teaching together some years ago and a very nice, intelligent young woman in our class asked me to explain female orgasm and the evolution of Lady bits during a lecture. So I learned in that in that insist center is that the phrase she used? Yeah, please that lady bit that was the phrase and it was very important that I not become embarrassed at that moment, which I didn't. I don't think I'm going to remember this. So there is one thing that must govern your actions. Should you ever be asked a question like this? Should you be male? Or I guess a gay female, which I thought which is that the answer you deliver must leave people with the impression they don't have to understand your answer, but they must be left with the impression that you are something of an expert about female orgasm. That is what they should walk away with a question from So, to that end, let me just say that I'm glad I'm letting

**Heather** 15:13

you answer this one.

**Bret** 15:15

Let me do this. Alright. So female orgasm is not obvious, which is why people ask about it. The fact is, females, by the nature of being the limiting sex have a very easy time coming by gametes, gametes, if that's what they need. And so why have this powerful reward system accompany various sexual acts? And the answer, I am almost certain has to do with the nature of human pair bonding. And the fact that the male orgasm has been borrowed by selection upended the two females slightly differently, but appended to females to facilitate a kind of sexual bonding, that results in an increase in fitness. So, in other words, females being rewarded by sex in this very direct and powerful way, behave in a fashion that is more likely to result in successful reproduction, that is to say, offspring that go on themselves to reproduce. And my argument would be that that is basically to induce females to engage in behavior that is rewarding to males such that they stick around at some level.

**Heather** 16:34

I agree with all that, but I don't think it addresses the question. It didn't have

**Bret** 16:38

to it just had to leave the impression that I knew a lot about it.

**Heather** 16:41

You didn't you didn't start there. Yeah. But I think as much as you know, that was that was actually a great answer to the question of, is female orgasm adaptive? Yeah, right. But this question is specifically about multiple orgasms, which is the part of the question where I'm like, I don't know, actually what to say here. Yes, adaptive, but, but why? And I don't have anything in particular on that.

**Bret** 17:06

For one thing, this is an incentive to females, but it is also an incentive to males. In other words, to the extent that I mean, male orgasm and female orgasm are very different in the sense that male orgasm rather famously changes one's frame of mind, almost instantaneously. The fact that it doesn't do that for women. And I'm not saying it doesn't do it at all. But the fact that there could potentially be other orgasms down the line keeps male attention focused. And again, the point is going to be the bond is actually vital to the fitness of both parties, and therefore each one is structured to deliver the other what is needed in order to keep them engaged. Okay,

**Heather** 17:50

that's good keeps keeps them focused 2040 years ago, that would have been described simply as mate guarding, but it does the same track. It effectively keeps you keeps you close, potentially, and, and ready to go forward to potentially even non sexual behavior, but it can go sexual again.

**Bret** 18:11

Yeah. And for those of you interested in this style of question, I would just simply point out, there are a whole set of features of human sex and sexuality that are utterly unique, and some of them that are mostly unique having sex when not fertile, female orgasm, concealment of ambulation persistence of female breasts enlarged when not feeding offspring. All of these things are part of a very sexually unique species. And the puzzle pieces don't fit together in a way and it's completely obvious why we're built this way. But it is a set of questions that is well worth spending some time thinking about and don't treat sex trivially. Alright,

**Heather** 18:54

Dad back to that. mandated lockdowns, curtail our liberties and destroy wealth and livelihood on a grand scale. Advocates for lockdown bear the burden of proof to show that a larger catastrophe is likely has that burden been met. There's an assumption on the question that advocates for lockdown bear the burden of proof. And it's this this I think would benefit from us being able to have a back and forth with the person who asked that question I can't even see the name of that person right now because of the thing that happened between the two live streams you know, what? In larger catastrophe being likely what would be the burden you know, what, how would you know likely where would you set the bar for likelihood or larger or larger given that lockdown, if it's successful reveal, not as large a catastrophe as no one was predicting how do you measure success? All of these are real concerns. And I think I mean, I think the big, the big place here that I at least and I think you Brett would probably At least begin disagreeing with the questioner is that advocates bear the burden of proof to show? Oh, I should look? No, I'm not sure that's that's the issue. It's

**Bret** 20:15

there's some tools you need to unpack this. There's the question of ex ante versus ex post. In other words, there's, you have to figure out what we would expect going forward where we don't know what happened versus what will have happened after we've been through it. So here we are choosing one of two paths, and they will have different outcomes. So there's an expectation of what the path will bring. And then there's the reality of what it does bring. And those two things. The ex post is not so interesting, because we're making the decisions ex ante. There's a question about precaution. So obviously, there are cost both ways. And obviously we don't end driving just because it would save lives, we decide that a certain number of lives we're willing to lose in order to retain driving. So by analogy, certainly there's a certain number of lives that we would be willing to lose not to have to go on lockdown, but presumably that number is something we can discuss and that the 10s of 1000s of deaths that we look like that we appear to be staring at and there is substantial data now about what results from the relaxation of lockdowns, what has resulted in places where the lockdowns have not occurred or have been less stringent. So we do have a lot of information. And the information that I have seen so far does suggest that there is some there are many lives being saved by this policy. And the other thing, and I don't think anybody's really getting this part, we don't yet know what's going to happen down the road, we are limiting the number of individuals in which this virus gets to evolutionarily experiment, we may be saving ourselves and indefinitely large amount down the road by paying the cost upfront of lockdown. Now, I can't say for sure that that's happening. But it does need to be in the conversation about whether or not to do this, can we slow this thing down by giving it less territory in which to experiment long enough that we can get ahead of it? What happens if this thing is recurrent, and comes back to people who have been sick again and again over their lives, if you knew that to be the case, you would understand that it was much more important that we prevent people from getting sick, because it's not like most of these people get sick and they get better, they get sick, and then maybe they get sick again, and they keep spreading it. Now I'm not saying that that's happening, I think it's probably not happening. But until we know for sure that it's not happening. it justifies extra caution. And I think a lot of these things that we're looking at are the same structure where the unknowns are still substantial. And at the moment, we have this thing somewhat limited, we could have done a lot better if we've gotten on earlier and had been more stringent, we could have potentially stamped it out in a matter of weeks if we had gone at it aggressively and rapidly. And instead it took us long enough that it escaped the possibility. So those are the things we're playing with. And I think when you hear from those of us who think that stringent measures are necessary, these are some of the parameters we're talking about.

**Heather** 23:30

That's great. What are your leading hypotheses on the mechanism of consciousness? That is the hard problem of consciousness? Please discuss your theory with Sam Harris, and his consciousness binary on or off? Or is it made of parts or layers? I'm serious. But he's included an emoji.

**Bret** 23:49

Oh, God, that's confusing.

**Heather** 23:54

Well, I think I think we can direct people to, to what we've written, it's not published yet, but also the talk that we gave at Princeton a couple weeks ago now. It's available online, at the James Madison program site. And it so that that will get at the second third of the question, which is is conscious binary? Or is it made of parts and layers? And I I suspect a lot I don't know if we've exactly talked about this, that there is that, that I anyway, imagine that there is a sort of a moment of illuminating, right? But then beyond that, it's very much it very much scales with the complexity of the brain and the social system and the developmental history and the length of childhood and the number of generations living together and all of this so that it's not, it's not binary and that you have it or you don't accept, yes, probably most organisms don't at all, but then the degree to which you can be conscious is largely explanatory in terms of whether or not you end up being able to breathe instance have conversations like this. And the mechanism is a different one. And maybe we already sort of covered it with the first question. Yeah,

**Bret** 25:08

I'd say, we are not believers that there is a hard problem, the hard problem is taken out of two parts. One is, What's it for? And the other is out of that work? What's it for seems more tractable? And our answer involves consciousness being a necessary layer constructed in the mind in order to understand what another mind is saying, thinking, feeling, etc. And so there's an emergent consciousness between two individuals that is necessary for them to plug their minds into each other in order to parallel process a problem, which results in higher quality answers, then the two minds working separately would be able to accomplish, how does it work? Obviously, that's a technically tougher issue. But is it so tough, that it's not going to yield to techniques that studied neurological phenomena? I don't see the slightest bit of evidence for that. It's a phenomenon of the brain, and it's a marvelous one. Is it you know, it's not going to be a threshold, right? We can define a threshold and we can say, is this animal across it or not, but the fact is, even in your own consciousness, you can feel that there are things of which you are highly conscious things of which you are not conscious at all, and things that hover somewhere in between, and that you can push that boundary around at will, by concentrating on things or ignoring them or whatever you do. So there's no reason to expect that that's not an analog for the way this is distributed in nature.

**Heather** 26:30

But you would argue, would you not that there are certainly organisms that have no consciousness? Oh, yeah. So that does suggest a threshold of sorts. But, but not one, beyond which it's really interesting to talk about, do you have it? Do you not like there's some level of consciousness and it's highly variable, within space and time, both at the micro and macro level?

**Bret** 26:54

mean? sort of seems to me like, you know, vascularization or something. Yeah, they're gonna be some entities without any, and then there's going to be every gradation up to the maximum amount. And that maximum amount is probably not a theoretical maximum is what we happen to have the maximum of, and so my guess is, consciousness is like that. And, you know, a spruce tree isn't gonna have any, you know, a spider probably doesn't have any and probably an octopus doesn't have any smarter that is. A cat has a bit a dog has a lot. You know, and people have the kind of consciousness you get when it comes packaged with linguistic capacity, which is, you know, leaps and bounds beyond anything else.

**Heather** 27:41

Good. Okay, questions from echo? The rationality rules video that you referenced, Brett said that homeopathy is literally false, metaphorically, true. Sounds conclusion driven? Can you give your take on homeopathy and how can its mechanism be compared to vaccines? And echo packs a lot into her questions?

**Bret** 28:00

Wait a second. I am not sure that I interpreted the video to say the same thing. Was homeopathy not described as placebo like in that video, and in that video he did have I don't think I've ever seen the video. So he unpacked metaphorical truth and he goes through the Peterson Harris debates and you know, I was very pleased that he said I had come closest to rescuing the baby from the bathwater with metaphorical truth. Anyway, his point was and actually I was thinking about doing a response his point was Brett seems to speak very carefully about behaving as if something is true rather than believing that it is true because he claims I am avoiding the trap that would be set for me with placebos. Now placebos are a topic that is absolutely deserving of an exploration. It's not what do you think it is, but nonetheless, I liked his conjecture. I wasn't 100% sure that I was consciously avoiding the trap of placebos. But I am aware that that that phrasing this carefully does avoid a whole spectrum of bad fates. And so anyway, to make a long story short, I'm curious whether I have misunderstood what he said about homeopathy or you did, I will have to go back and look, but he's right. My rubric for presenting metaphorical truth does negate the question of the importance of placebos, because it's a question of behavior, not belief, the way I phrased it,

**Heather** 29:33

good behavior, not belief. And then the end of that first question from echo is, how can the mechanism of homeopathy be compared to vaccines and I would say the first pass, there doesn't appear to be a mechanism of homeopathy. It is entirely belief and to whatever degree that belief can change outcomes in some sectors. It therefore has the possibility of sometimes having an effect but vaccines are actual biological agents that are being used to get your immune system to respond on your behalf. And homeopathy is doing nothing of the sort.

**Bret** 30:08

Yeah, the vaccines take fragments of something or inactivated viruses, and they inject them into your system where it rep your system recognizes them as hostile and it learns to fight them in their enfeebled or non viable form, then it's better prepared when you are challenged with an actual pathogen,

**Heather** 30:29

rather than like the dead viruses that are being shed by the people who were infected. That data as well. Right? Yes. Sorry. Go on.

**Bret** 30:36

No, that's it.

**Heather** 30:37

Okay. Second question from echo. Second questions. You say that values are discovered if we agree to kill bedbugs because of traumatic insemination? Sure, that's the phrase intended here, but it is okay. Okay, if we agree to kill bedbugs because of traumatic insemination. We agree humans hold better values. Say bedbugs don't feel pain. is pain, a prerequisite for bonding and consciousness?

**Bret** 31:04

Okay, Echo. Some humans have better values than bed books. All right. Sure. You're not drinking? I have not even if I drink. Water? Yeah, so I want to understand this question. First of all. I think there's a conflation of things, several things. values, are values discovered, I certainly don't think I've ever said that. We've talked about the need to navigate to superior locations, superior being defined by an agreement on the values that we are trying to reach,

**Heather** 31:46

what would be the alternative, discovered versus creative? Well, like those that they were always there, and they're being discovered, as opposed to created by him.

**Bret** 31:56

I think this was in his art. If you I think there are those, for example, Sam Harris, who I think sets a high bar in general, people who believe you can derive the art from the is our limbs. Obviously, Sam isn't. I don't think he's right, as I've told him, but nonetheless, you could deduce values, if they were properly connected to is, my point would be, why bother if you take people, reasonable people, and you query them about their values, what you will find, and I've done this experiment many times, is that in general, most people, at least in the West share a large number of values, what they don't share is the ordering of them, that is to say their priority relative to each other, or their assessment of where we are as a society with respect to realizing those values. we differ over that. But in general, what we all want is pretty similar. And so anyway, you don't have to derive this from an is it probably isn't possible to derive it from an is and just not sure there's any value in it. So the question then, is, we should kill bedbugs because they infest your house in your bed and they cause a terrible rash. That's good enough reason for me, not because their values are bad. In fact, I can pretty much guarantee you they don't have values. They just they're little robots that are programmed to do their bedbug thing.

**Heather** 33:32

As with so many of echos questions, there's, we could unpack it. I think the question self is so fractal. It has many, many layers. Yeah, but maybe we will move on in order to get through a few more of these

**Bret** 33:45

questions. So the last thing echo says is, bedbugs don't feel pain is pain, a prerequisite to bonding and consciousness? I don't know if it's a prerequisite to consciousness. But I would say

**Heather** 34:02

but it always does predate it in evolutions of consciousness that we see on this

**Bret** 34:09

planet. Yeah. On the other hand, the things that you have listed, that contribute to the likelihood of the evolution of consciousness are all things that would require pain to keep you out of damaging trouble,

**Heather** 34:21

which would require which would suggest therefore that it is that pain is a prerequisite for consciousness? I

**Bret** 34:25

wouldn't call it a prerequisite, I would say it always precedes it, you know, in the same way, yeah. So you know, you have to you have to be born to feel pain, I guess. But, you know, prerequisites kind of a it's a it's not a logical prerequisite, as far as I know. Yeah. But I would say there is an argument to be made that pain are some analog of it is a prerequisite to meaning. I wouldn't be surprised if that was a fair claim. So anyway, I don't know if that's what you're after. But that's good. I like

**Heather** 34:59

that. Thanks for the podcast. This is a two part question. You're going to read both of them. Thanks for the podcast, you both earned my trust. Great, thank you. Can you more thoroughly addressed the Reddit article by virologist James door PhD, which argues for the non lab immersions theory of the virus, door resorts to ad hominem attacks, appeals to authority and straw man arguments, but he also makes scientific arguments to my music theory degree has not trained me to evaluate. I believe this is the long one that we got asked about last time. And that you then what you said about it last time and I haven't looked at it was, it's super long, it appears to engage a lot of the arguments. And that leads you to suggest that maybe it's it's doing something right. But when you picked a piece out of it somewhat haphazardly, you found that he wasn't making good sense. So you've now spent just a little bit more time with that

**Bret** 35:53

significantly more time. What's more, I've handed it off to some folks who know more about it than I do. And I must say, it doesn't get better, it gets worse. Now, that said, I'm having trouble remembering the name of the author, I think this is the right paper. But if we were discussing some different paper, then all bets are off. But if it's the one we were asked about last time,

**Heather** 36:14

well, the question are and again, I'm sorry, I don't know your name, the moment because of how we're looking at these. Can you more thoroughly address the right article I

**Bret** 36:21

so this is the article that last time I said was an air an error, because it claimed that the source code to would show hallmarks of genetic engineering if it had been altered and does not show them and it's wrong on both counts, because it wouldn't necessarily show them people of Ralph Barrick, for example, has demonstrated an ability to do seamless editing. And the other thing is this virus does show some evidence, but this is actually a good, maybe this is what you're looking for. To say that this virus shows some evidence of genetic manipulation is not to say that the evidence is conclusive. It is to say some evidence. So I think we've been tripping over this, those of us who've been discussing this in public, which is to say, people say there's no evidence of and that's just not true. There's lots of evidence and the evidence doesn't all point in the same direction. So we have to be very careful. And we could frankly, be generous with each other because we all have an interest in figuring out where this thing came from. We do whether you realize it or not, we just simply do so anyway. Yeah, I think that papers full of laws, and I believe soon we will explore them more deeply. Maybe not with respect to that paper itself. But the general arguments, it's it's marshaling.

**Heather** 37:50

Next question, dumb, unnecessary plumber here. Is it possible for mosquitoes to be a vector for COVID? I want to start by addressing the the layup, layout, layup, set up this question, dumb, necessary plumber, I assume that that dumb is included here, because much of the white collar world imagines that those who do real work that has manifestations in the physical world, aren't as bright as those who sit behind desks and work in cubicles and such. And this is, of course, a position that we have argued against, stringently, forever, not not merely because so many of our most brilliant students themselves came from the trades often, and not merely because we both do physical work ourselves and have have learned sometimes the hard way, how difficult much of it is and how valuable it is, and how doing work that has a manifestation in the physical world means it's not gamble. And therefore you actually know at the end of it, whether or not you've done something right or wrong, whereas so much of the work that's passing for intellectual work, or at least white collar work now has no such outcome. And so you just can't tell. And so those people are more likely to potentially fool themselves more and more and more, you can't do that if you're a plumber. So let me just start by start by addressing the idea of a dumb plumber. I don't think it's possible Really? Is it possible for mosquitoes to be a vector for COVID? No, I think we have seen it transmitting. in so many places where there are not mosquitoes at the time of year where it's transmitting. It's transmitting almost entirely indoors, where mostly people don't have mosquitoes. vectored vector diseases just have very different hallmarks to them, and I can't say what they all are, but I would say I would, I would, I would put a lot of money on this isn't a vector to disease.

**Bret** 39:49

Well, we have to do a little interpretation of what the question is. Is it currently vectored by mosquito in any meaningful degree, I I think we know it is not okay. I can obviously construct a reductio ad absurdum where you've coughed on a mosquito. Somebody inhale, you know. So that's conceivable, is it conceivable that it could evolve to be transmitted by people biking to get totally But could it evolve to be vector by mosquito? Here's what I want to know the first if I became obsessed with this question, the first thing I would want to do is figure out whether any Coronavirus is being vectored this way and I don't know they're certainly. So yellow fever is an RNA virus vector by mosquito. So RNA virus, yes, but yellow fever isn't to Coronavirus. So, I would love to know, are there any known coronaviruses vector by mosquito? If the answer is no, then the answer to your question is probably not. If the answer is yes, then the answer to your question is could be let's not give them the opportunity to evolve that trick. Yeah, let's not.

**Heather** 41:06

Please, here's a request for us to look at something that we haven't seen yet, but I'll just read it please look at polar 5040 is fantastic analysis of SARS. Coby two sources of the YouTube link. His points about evolve versus Comerica origin are particularly relevant. Okay. Are you familiar with the danger model or dangar? I don't know what it is in immunology, which says right there that I I at least don't know it. And he has a great video cast series by Polly Metzger, which may or may not be related to this, you know that name?

**Bret** 41:36

Um, I believe I saw some very good stuff. I couldn't swear that was the name but I think so. The dangar model. So here's the problem is I took immuno biology at the University of Pennsylvania back in 1991 8780. Right, yeah, AB

**Heather** 41:57

are your freshmen or sophomores at eighth or ninth grade course.

**Bret** 42:01

Did I learn this model that the model exists yet? And have I forgotten that? That's the name of it? I don't know.

**Heather** 42:08

At least don't know it by that name.

**Bret** 42:10

Yep. If it's new, and probably we don't know if it's old than probably I knew it. But I forgotten. That's the name. Yeah, sorry.

**Heather** 42:17

What time are we at? sec. 42. Okay. Let's just we get two more questions. And then I'll switch we got a few more, but let's just do the next two here. Have you read any of the work done by David Deutsch? And his take on preparing and epistemology? Regardless, do you think popper had it right? knowledge through conjecture and criticism, not empiricism? That's an interesting characterization of popper. That's not how I would have characterized it. I think I know what is being alluded to here. But it's not it's not the part of popper that we were focused on, through, you know, clubby and such and epistemology when we were in graduate school. Yeah. And I certainly never heard in the long discussions that we had about popper and falsification and such a desire to throw out empiricism. But I don't know can you go farther with us?

**Bret** 43:14

Yeah, I mean, I would say a popper had it, at least partly right. falsification is clearly a huge step in the right direction. I would doubt he had a completely right and he certainly didn't all along one of the most important things and the reason that he was sort of contentious in our grad school environment was that he had initially been kind of an anti adaptationist and he came around later in life. So that's, to his credit, he saw the power of this style of thinking. And anyway, so I would say loosely speaking, I feel pop harrion I'm sure I don't subscribe to all of it. I also feel Darwinian and I don't subscribe to every detail. But um, but anyway, yeah. Did you have a right? He advanced the ball substantially.

**Heather** 44:10

Yeah. And with regard to David Deutsch and his take I have read some of the of George's work but I don't remember his take on popper particularly.

**Bret** 44:19

Yeah, if you do me either. At the moment, I'm a little leery based on his multi world. stuff but Deutsches Yeah. So anyway, not much to say unfortunately.

**Heather** 44:34

Yeah, the last the last two questions I want to read here are both ones I'm not sure that we can do particularly well on Have you any thoughts on Terra preta, the black Earth of the Amazon. Thanks as always, I don't know what that is. And I don't know if it's possible that the spelling is throwing me I don't know. I will look it up. I'm sorry. This Yeah. What is it?

**Bret** 44:57

It is a kind of self renewing. artificially enriched soil. So it's kind of it's part of Amazonian agricultural tradition that goes back a couple 1000 years. Anyway, here's what we've learned

**Heather** 45:18

by agriculturalists in the Amazon, long before there were any people, but the original bur engines in the new world who are doing this sort of with bioactive techniques like,

**Bret** 45:30

well, so it you know, it's reminiscent of what the Maya were doing, in a sense of the Maya had very sophisticated soil chemistry at the empirical level, what they understood about what they were doing and why it worked. We have no idea. Sure, but, but

**Heather** 45:45

it was cases of both the amazonians and the Maya, Maya less so. But we're working with very poor tropical soils, as tropical soils tend to be except in volcanic zones. Yep. So well, they needed to enrich their soil if you're going to be agriculturalists. So Maya,

**Bret** 45:59

in many cases, we're working with alluvial soils, which are better than average net, but we're still talking about a tropical alluvial soil on the amazonians. We're obviously working in an environment, which there's a lot of nutrients, but it's not in the soil. It's not very deep at all. So anyway, the soils were enriched in a way that at my understanding, which is very superficial, is that they are sort of self renewing, and that they're still sort of functionally finable.

**Heather** 46:29

Still now.

**Bret** 46:29

Yeah. So anyway, amazing, right? It's fantastic. The story is anything like we think it is, it's a case of human beings having made a discovery of some form that allowed them to alter the capacity of the Amazon to deliver crops. And that, in effect, what they've done is something you know, where we would have trouble reproducing the level of success on that soil. Yes, we can drench it in some kind of externally derived fertilizer, but a self renewing soil would be, you know, beyond us what you could do. And yet, people who didn't have sophisticated laboratories, or a periodic table or anything, were able to deduce how to get there. And this is the nature of human beings. It's the the flip flop between culture and consciousness, and this is the kind of thing it produces.

**Heather** 47:26

Yeah, that's great. Okay, Zack, you want to show us questions from the next live stream. Okay, we are giving our wonderful 16 year old son one second.

**Bret** 47:39

Has he been upgraded to wonderful? Yes, yeah,

**Heather** 47:42

actually I made that decision without asking you.

**Bret** 47:45

You didn't have to ask you now Yeah.

**Heather** 47:49

Okay. Heather, what is the biggest challenge you witness Brett face or overcome? Brett? What is the biggest challenge you witness Heather face or overcome? Brown? That's a big question. Yeah. Do we want to try to answer that now or do you want to save it for having with the with the promise that we will try to address it but save it for? I'm cool either way. Okay. Well, I guess also the thing about us looking at this screen is that we're seeing us like 10 seconds ago. That's super weird. It's fine. It's fine. I think the the trade off having to do with your unique brilliance makes it difficult for you to meet some of the expectations of a modern society. Go on I know that to be true as as Do you. Yep. And it is not for lack of self awareness on your part certainly when we first met when we were in high school you weren't aware but watching your self awareness of your own difficulties and meeting expectations that need to be met that are not simply onerous or stupid rise with with with a rise also in your ability to overcome that but it's not commitment with like the rise in your ability to overcome it hasn't risen is hasn't gone as fast as your rise and self awareness. So in some ways, you're more ever more frustrated with yourself? I think.

**Bret** 49:43

Yeah, that's right. Yeah. And it sucks. I know what I should be doing. I just can't make myself do it. All right. So you know, I'm gonna swap the answer I was gonna deliver for a better one. I think, more insightful. You share

**Heather** 49:59

with me. The other one Later on,

**Bret** 50:00

sure nothing that would surprise you. But the thing about Heather, is that she was tremendously introverted. And she still has these instincts. But she has discovered over time, that the value that she can deliver in the world that her ability to generate things that she holds in high enough esteem to be worth her time, as required her to find skills to function as an extrovert, even though it is not in our nature at all. And in particular, you know, I, when you first started teaching, I think you were just mortified by standing in front of the class. Yeah, you really did. And so I watched in a very short number of years, it wasn't like this was the way things were at the end of your teaching at evergreen, this was the way things were all along you having learned this trick, as a teaching assistant in graduate school, but you managed to induce a kind of desire to impress you and get your approval in students that most people, if they had that kind of influence over people would abuse it, or they wouldn't take it seriously. But you used it so carefully, and so honorably, in order to get students to perform at a level that most of them did not know that they could perform. That it was, it was, it was astonishing, because, you know, first of all people were very frequently your students were very frequently intimidated by you. And so they would talk to me about this I, for some reason, they were less intimidated by me. And they would talk to me, no, it's absolutely true, they would talk to me about, you know, their concerns. And if you know, somebody did something great, and you, you know, would your feedback with, of course, always extensive, and you would deliver this, this piece of feedback to them. And they would be just so overjoyed to have discovered something that was of enough value to catch your attention and all of this. So anyway, my point is, you mastered something that was outside of what even felt comfortable for you at first. And, you know, I think you still have this tension within you. But the way you overcame your own shyness in order to be able to slam dunk the role of professor and be the professor, everybody everybody needs, and most people who see it know enough to want that. Right, that was stunning. And I have to tell you, among the things that makes me absolutely the most livid about what happened at evergreen, was that they dared to do this to you after you had risen to the top of this. This role where, you know, students are toward you, and they were so right to do it, because what you were doing was so good for them, and that these people treated that with such disrespect was just despicable. Absolutely despicable.

**Heather** 53:13

That's an amazing answer. Thank you.

**Bret** 53:17

It's ultra. And you know what? There's not a student that was in your class who wouldn't back me up?

**Heather** 53:30

How about this, for the next unknown virus, offer $100,000 to people to get infected and live on site of the infection clears sample size 1000. In two weeks, we would have an estimate of the death rate.

**Bret** 53:46

I love ideas like this, I don't think we need it. And I don't really want us to engage in this kind of thing, because we don't need it. But I do, I think we need to start thinking like this.

**Heather** 53:58

But it would give us it would give us more than just a death rate. Right? It would give us other clues to how it progressed and people who didn't die and how people recover it and such. But it would mostly give us a death rate at a particular moment in time. And as we've talked about, as you specifically talked about in the last last few minutes we've been talking about for many of them. The fact is that the reason, one of the big reasons this is so hard to pin down is that it is rapidly evolving. And so that would give us a snapshot of it's early. It's early evolution, especially if it's an emerging virus that hasn't known humans before now, that that that first moment that it's in humans is not necessarily going to look like the moment three months later, six months later or a year earlier.

**Bret** 54:45

Yeah. So in principle, something like this. I prefer in the case of infectious disease, that we find good natural experiments so that we don't end up confronting the ethical dilemma of Effectively paying people to suffer harm on our behalf and things like that, which, you know, people sign up for clinical trials and stuff. So it's not like that's unheard of. But anyway, there's a slippery slope here. And I would like not to step so far on to it that we end up, you know, crumpled heap at the bottom.

**Heather** 55:20

Yeah. I have followed you since evergreen debacle. Thank you. What do you do when you are weary? Hmm. Well, the number of things. Yesterday I had a particularly agonizing and horrifying day, trying to learn new tech software and get our various threads financial threads into a single coherent mass. And it was not successful. And I mean, I was literally in tears at times, which doesn't happen very often, there's a

**Bret** 55:56

point in the middle of the day where you were flirting with the concept of anarchy.

**Heather** 56:01

That's rarer than tears for me. Yeah. And at some point, oh, I don't know, six 630. You came in to I was working papers and computer all around me. And just to my head in my hand, I'm like, Oh, my God, and you said, We're going outside. And it was a gross day here. It was cool. And I mean, for me, it was dark, and gray and a little windy and a little bit rainy. But we live in a beautiful place, we live in the forest. And we've made it more beautiful during lockdown by a lot with with getting rid of a lot of the invasive plants and planting a lot of things. And, you know, I said to you standing out there, just you know, even just for five minutes, I said, If I had to choose, if I had to choose three, never being able to be outside again, and never being able to be on a computer, again, choices. so obvious, even though it would interfere with my ability to do what I want to do in the world and be creative and productive in the way that I need to. So being outside in nature is is a big answer to what what we both do, and we're wary. And there are many other answers.

**Bret** 57:11

Yeah, I'm not sure how much I relate to the concept of being wearing it, you know that there's certain things that just I know, they exist. It's not like I haven't felt them, but, but they just don't crop up that much. You know, there's a lot of times when I'm just not productive the way I should be. I know what I should be producing. And I'm not producing it. But. But that said, I do feel like we've chosen to live in a way that that there's a lot that's thought provoking, and sometimes being lost in thought and then finding something interesting, and sparking a discussion and seeing where it goes that that process is productive over the long haul, even if you couldn't measure the productivity in a given day or a given week. So anyway, I've learned to trust that and it's amazing how often the, the answer you've been looking for comes out of the blue after months, sometimes years of searching in what feels like an unproductive way. And I know those two things are not disconnected. So the searching doesn't feel productive, but it is productive. Therefore you should hack the system so that you can feel productive with it without requiring yourself to deliver evidence. Because eventually, the thing you know, just emerges and it's like oh, well that was worth it.

**Heather** 58:39

Good. Does being left handed say anything about humans either psychologically. Maybe physiologically, psychologically isn't a thing we are so I'm going to go with, I'm gonna start over again and insert my interpretation of what this word is, Does being left handed say anything about humans, either physiologically, or psychologically? I love you guys. Thanks. So another topic about which I could talk endlessly. We as vertebrates have lateralization, which means we have we're bilaterally symmetrical, and we are perfectly symmetrical at the at the brain level and therefore, at at the appendicular, skeleton level. So all of us all of us humans, have not just a dominant hand, but also Dominant foot dominant ear a dominant eye. And once you establish your dominant hand is it's likely that you're the same Dominant foot and ear and eye but not totally clear. And so what what would be the value in having one be dominant over the other? Well, it's a kind of specialization. Right? But then why shouldn't everyone in the population just have exactly the same specialization it would certainly make it easier for the left handers, myself included. If I did didn't always have to find a different spatula, a different pair of scissors you know, um, you know find when we're sharing cheese together, I have to switch it around to be able to access the, you know, the correct end of the cheese, etc. But at a population level, having roughly 10% across all populations where it's ever been looked at, which is to say pretty much all human populations have been looked at roughly 10% of the population being left handed as opposed to right handed, allows for a different kind of approach to situations and not just a physical approach, like oh, I'm trying to climb a tree and all the runners before me couldn't get there. But the left hander has a different, different vantage on it. But also just a different, a different mental approach different like meant from mental rotation to just mental gymnastics, metaphorical gymnastics, is is differently allowed by a left handed brain. It's also true that left handers are less specialized with regard to lateralization that we tend to have larger, more connected corpus callosum, which means that our left and right hemispheres are more connected. Of course, the trade off being that it's harder to get things past one hemisphere with the other and perhaps harder to find total utter focus and go super deep that you know, it's maybe more of a generalist paradigm. So there's a lot more to be said there. But

**Bret** 1:01:23

tantalizing fact you tell me if I have it wrong, in large corpus callosum accompanies the condition of being female, being gay and male and being left handed? My Correct,

**Heather** 1:01:35

yes, with the caveat that so this is something I used to always say in my classes, and occasionally I'd get. So it's not just gay, male, just homosexual. So females, homosexuals, and lefthanders, all are understood as I used to say, to my classes a lot to have larger corpus callosum than, than men, straight people or right handers. And you know, in almost every class, I'd get someone going, you know, I'm all three. But it's a it's not better, it's different. You know, it's, it's just a different way of being that is better in some situations, but not others. And when I looked into it recently, I think that I remember that the data around women was actually a little bit more nuanced than it seemed. Because of course, like all of these things in a complex body, like a human body, corpus callosum doesn't have strict boundaries. And so exactly what you're measuring is, is not totally clear. And if you measure it one way, it seems like females have slightly larger corpus callosum than men. But if you measure it, maybe a slightly more standard way that difference disappears. So I'm not sure that it totally holds up, but it seems to maybe,

**Bret** 1:02:46

so the data around them is harder to understand and smells better. Is that what you're saying?

**Heather** 1:02:51

It's exactly what I saw. Okay, perfect. Yeah. Is virus RNA more information intensive than human DNA, referring to non coding DNA? If that is the case, does it affect how viruses evolve compared to say mammals? Information intensive? Sure, hard information intensive means

**Bret** 1:03:13

I think what it means is less room for noisy stuff. And that's probably true. The fact of

**Heather** 1:03:24

just because it's more constrained by size. Yeah. Is that why you say it's probably true?

**Bret** 1:03:27

Yeah, the cost of wasted space is, is higher relative to the total. That said, junk DNA is a concept that I'm proud to say, never made a whit of sense to me.

**Heather** 1:03:42

And this person doesn't say, jack, right? uncoding,

**Bret** 1:03:44

right. Yeah. So there is noncoding stuff that is still contains information to me would be great example. So it's a little hard to evaluate a question because there may be more of that stuff in let's say, vertebrate DNA than there is in viral DNA, because maybe more of the viral DNA is protein coding, or there abouts. So anyway, it's hard to compare the two, I would say probably there's more room in vertebrates for noisy stuff and inefficiency. And so you might expect more of it. And yes, this would have an effect on evolution, because what it means is nonsynonymous mutations would be more likely to be disruptive. So anyway, you might expect something like that to alter the rate of evolution under certain circumstances or maybe all of them so yes, broad brush, I think you're on the right track, how to say it specifically. I don't know and I'm sure there are people who are expert in this exact question and we're not them.

**Heather** 1:04:56

So we are at an hour and 10. We are Thank you. All right.

**Bret** 1:05:04

Well, we have arrived at the end of the q&a. Wow, that flew by. Yeah. All right.

**Bret** 1:05:12

So this has been excellent. We will return on Saturday May 23, with a evergreen themed

**Bret** 1:05:23

retro spective special live stream darcars podcast and that sort

**Bret** 1:05:30

of thing. So look forward to at 1030 Pacific 1230 Pacific.

**Bret** 1:05:35

So like, subscribe, comment, hit notify, be well stay safe and we will see you on Saturday.