Your Questions Answered - Bret and Heather 3rd LiveStream\_ B...

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**SPEAKERS**

Bret, Heather

**Bret** 04:33

Hey folks, welcome back You are now in the queue and a stream where we are going to attempt to answer all of the questions that you all have submitted during the live stream portion.

**Heather** 04:46

There are awful lot that there are a lot We will do our best to try to get through.

**Bret** 04:50

All right. So should we start at the top

**Heather** 04:54

start at the top.

**Bret** 04:55

Okay. What is that name? Is it ready? Yeah, Glasgow. Okay. So evening, guys hope you're well, how do you think society and politics will change following the pandemics decline? Let me just say, I hope that this will change us absolutely radically. And my fondest hope would be that this wakes us up to all sorts of things. And that as bad as this was, it will actually leave us ahead in the end, because we've had a trial run at something that could have been far worse and unfolded far faster. So anyway, there's no guarantee that things will not get vastly worse as a result of political bumbling and the unexpected. But nonetheless, it is possible we come out of this ahead, because we will have learned a valuable lesson Yeah,

**Heather** 05:50

we can hope we sort of see governments across the world reverting to the mean. You know, Hungary is going authoritarian, for instance. So that is not hopeful, but we can we can hope that it will do the opposite. What is necessary to what is necessary to test for viruses were in the bottle? Can we body? Can we sample materials, equipment, etc? What innovations and testing are possible? Can you DIY it, we spoke to tests a bit in our first live stream. It's not our wheelhouse all the particulars. And there are a variety of different types of tests. And as far as I know, there's no possibility of DIY and the creation of tests.

**Bret** 06:27

I don't think we could DIY the creation of tests, antibody test could conceivably be distributed, and you could do it at home. In fact, our phone very much so did blood type testing. Last night, all four of us, I thought I knew my blood type I turned out to be right, based on a test I'd done many years ago.

**Heather** 06:46

So this was a de facto paternity test for our children as well.

**Bret** 06:49

I wasn't worried. Were you worried? I was not worried. Okay, good. So anyway, yes, those kinds of tests could be distributed. And that would tell you if you had been exposed at a high level such that you had circulating antibodies, it wouldn't tell you whether you had it or not. That's so it's partially Yes. Partially no and do it yourself. So

**Heather** 07:06

there's a question you're wearing body? Can we sample? Certainly saliva? Probably blood, probably fecal. And I mean, those are the obvious easy choices.

**Bret** 07:17

Okay, do you think secrete or status could be why some people are asymptomatic? Yeah, this is a tough question. I think it's conceivable as a creator

**Heather** 07:28

status, as I understand that it is not something that we know a lot about, but it is whether or not you basically secrete the antigens of your blood type into bodily fluids like saliva and, and blood. So it's not it's not the same as Are you a, a B or A B, which is to say, do you have those antigens? versus Are you Oh, do you not have any of them? But do you actually secrete them into your bodily fluids?

**Bret** 07:53

Yeah, and so it's possible that these things could molecularly gum up the works of Coronavirus and leave your tissues more intact? That's pure speculation. It does mirror what some antibodies do, which basically take things like viral particles and they glue them together so that they can be consumed by something like a macrophage and then rendered harmless. So I don't know. It's conceivable, but we don't know enough about it to say.

**Heather** 08:23

Let's see a request to invite discussion with an Austrian economist with regard to game B. Robert Murphy.

**Heather** 08:34

Any thoughts on the great Wim Hof and other Yogi type breathing to boost immunity? Let's speak a little bit to this phrase boost immunity.

**Bret** 08:40

Yeah, boost immunity is one of these phrases that gets tossed about that has very little meaning. The immune system is an amazing piece of non engineering as it were. And it functions it has some general components like the macrophages that I just described, which go around basically collecting garbage including pathogens, and it has a bunch of what's called specific immunity, the circulating humoral immunity, which has to be targeted at the very signature of the the pathogen in question. There's almost no meaning to boost immunity with respect to the second now it may be that you can compromise immunity by not having enough sleep or being dehydrated or something like this, causing the whole system to falter. But boosting immunity beyond a healthy status is very often a phrase that is used without much meaning to it. It's often

**Heather** 09:36

a kind of quackery, right? You know, if you're, if you're, if your system could simply be functioning better, why isn't it one therefore, you know, if it's not, there's either a cost to the thing that you've now just innovated that you don't know about, or you haven't actually innovated anything?

**Bret** 09:52

Yes, I would say if you're going to engage in Yogi type of breathing, that's unlikely to hurt you unless you do it next to somebody who is coughing out COVID-19. So maybe if you're going to try Yogi type breathing, it's unlikely to hurt you but do it with proper distance from other human beings.

**Heather** 10:08

Yes, very good. To what extent do you think Dawkins concept for the extended phenotype, the concept for which he is apparently most proud will apply to the evolution of society and politics following COVID-19 decline?

**Bret** 10:20

Well, I'm more or less think that it always applies to the way societies evolve in every regard in every regard,

**Heather** 10:28

and the virus itself is part of our extended phenotype now, alright, and our response to it is, the diseases all of them are.

**Bret** 10:36

Yeah, it is Dawkins himself. When I met with him. Two October's ago, was skeptical of the utility of extended phenotype applied to cultural evolution in humans at a large scale, but hopefully he'll come around on that. All right, are we big Katy Perry fans, or dark horse comic fans, I became aware of Dark Horse Comics after I initiated the podcast and many people forwarded their logo which has some reminiscence of the logo that I put together, the extent of your familiarity. That's the extent of my familiar familiarity, and I wouldn't

**Heather** 11:21

recognize Katy Perry on the street. So I think that tells you how much of a fan

**Bret** 11:26

Yes, I was also made aware I knew who Katy Perry was, but somebody alerted me that he has a very popular song called Dark Horse. So anyway, no, we're not fans. You know, we're, we're more rusty rockets fans, let's put it that way. Okay. I truly value these talks. Thank you. How are so many recovering from COVID-19?

**Heather** 11:56

The question seems to imply an extraordinarily high level of virulence, which there are a number of ways to define virulence. But this has a very high transmission rate, and it is deadly. And it leaves it leaves its imprint on many of those who have survived. But the fact that it has something something like it's gonna end up being something between point 5% half a percent and 2%, probably case fatality rate, probably closer to the point five is much, much different from the boy, I want to say 50 to 60% fatality rate of something like Ebola, and I may that number may be wrong, but it's not wrong by an order of magnitude. So how are so many people surviving? This isn't the disease that kills the majority of people who get it? That's not that's not the type of pathogen it is? Yes, that's both a true answer. And absolutely not explanatory in terms of what the mechanism mechanism of action is, for instance,

**Bret** 12:58

I would say the question is a little bit on its head that a human being is a miraculous example of a self repair architecture that goes on for 8090 100 years, if it's in good circumstances, and that this is just another case where something doesn't so compromise most of the people who get it that they can't repair. Anyway, now the story for another day. Let's see just ordered bandanas. We should start naming people. So just ordered bandanas that's Derek. his inner cowboy is calling congratulations. Let me know when you learn to yodel. Okay. jp Peters, thank you for doing these. You're very welcome. Jonathan storm. Can you explain Pedro's paradox and give your thoughts on the idea? This is a big topic. Pedro's paradox is the observation that although cell size is similar between organisms, and therefore one would expect vastly more cancer in bigger animals because they have more cells that in fact, big animals have much less cancer than you would expect. It is a fascinating observation when I've thought a lot about I think the answer comes down to telomeres. I will have to go through that explanation another time. But in essence, you have another parameter that is scaling, which is the tolerance for what I've called proto tumors. So anyway, we will return to that another time, Jonathan. Okay, what are

**Heather** 14:27

some of the most common effects of stress on human physiology? And are there any cool bio hacks that you can recommend to help people fortify themselves eg IE again Wim Hof breathing with the hashtag make politics boring again Yeah, thank you for that militant moderate. So you know, the the common effects of stress are the usual things that we've said here and in our first live stream, insufficient sleep, insufficient hydration, insufficient nutrients in the form of whole good fresh food. And then there are some things Around timing, which 20 years ago, no one was really thinking about. So something like intermittent fasting appears to actually be very effective for many people with regard to reducing physiological stress at the dietary level. A few things that have been used in various parts of the world for many years, but are now getting traction in the West, things like turmeric seemed to have some value potentially at the dietary level. being outside,

**Bret** 15:30

being outside, certainly, I would say, story from my own life, the cost that I was paying in terms of health, and in terms of susceptibility to, in particular, respiratory viruses, for ingesting wheat, which I was very allergic to and did not know, the cost was incredibly high. And basically, it manifests as body wide inflammation that was affecting every system badly. In order to discover that I had this allergy, I had to go to extreme lengths to eliminate wheat from my diet completely 98% is not nearly good enough, you have to really be careful, and over a long period of time to see these things. And I do think it points to the need for all of us to figure out if there's something that's common in our diet, that we are reacting to badly, and just identify it so you can eliminate it.

**Heather** 16:24

But just to just pinpoint this thing that you said, again, an elimination diet needs to be an absolute elimination diet to work or else, not only Don't you have the data you think you do? Well, it's that you don't have the data that you think you do, if you just did a little bit of whatever it is you're eliminating from your diet. And you will be confused into thinking that therefore you now know that that item, whether it's wheat, or peanuts, or chocolate, or eggs, or whatever it is, you will be confused and thinking that it's not a problem if you just reduced the amount that you were eating. So that's a bit bit far afield from the original question, but and again, you know, the Wim Hof breathing. We've both been exposed to it, it seems like it's potentially interesting, but we don't know much about it.

**Bret** 17:08

All right. Chris asks how, oh, this is a hard one to parse. Yeah.

**Heather** 17:14

So jumping forward, how much difference to within this question, how much difference can I make by socially distancing and staying at home when possible, if a large portion of people aren't doing the same?

**Bret** 17:24

Well, you can certainly have a big effect on your own life, you could potentially prevent yourself from contracting and even if other people are spreading it around.

**Heather** 17:32

But but but that goes sort of both ways. If you're, if you aren't already positive, if you haven't already been exposed, you substantially reduce the chances that will that you will get exposed. And if you have been exposed, you are now protecting the entire population that you're not exposing by going out. So whether or not you know, your status, staying home, even if other people are not, if you turn out to be negative, you're protecting yourself and you're trying to be positive, you're protecting others. But that will be the case, regardless of whether or not the rest of the population is staying in or not.

**Bret** 18:05

Even if you're negative, you're protecting others, you're protecting everybody who would be downstream of you if you can track it. And so,

**Heather** 18:12

so if you're not negative now, but you become positive, or if you are negative now, but you become positive, when you're out,

**Bret** 18:17

then there would be a bunch of people downstream of you, some of them will die. So you're probably saving lives. This is a place where game theory comes in really handy, though, because, yes, you have you are in a position to do a tremendous amount of good even by just isolating yourself, because anybody who would be downstream of you won't then get it at least from you, and therefore will die as a result of your behavior. But the cost of isolating goes to you and the benefit goes to all of these people you'll never know. And so the game theory does not support this behavior, even though it's the right thing to do. So do the right thing. Ignore the game theory.

**Heather** 18:53

That's right. Would you be concerned about taking a hastily developed and tested vaccine? Yes. Under these circumstances, I would be less hesitant than under circumstances where, for instance, you know, we're all our entire family is vaccinated against yellow fever, which most viewers probably aren't because you haven't had reason to be vaccinated against it. If if the CDC came out with a new vaccination for yellow fever and said, Well, this is 2% more effective, but we just developed it, there's no way that if our titers were low, and we needed a new yellow fever vaccination, that I would opt for us or our children to get the new one, right. So this is this is a different situation than for a disease that we've already long had a vaccination a vaccine for, or where it exists only in certain parts of the world. And you can protect yourself simply by not going to those places for the moment.

**Bret** 19:47

So if I would also want to say in answer to Arthur's question here, that this is a place where I would really want the testing because as we described in our first live stream, there's a strong positive That some or all of the people in our nuclear family had COVID-19 back before it was understood that it was in the US in any significant way. And if we have had it, we may effectively already be immune or close to immune to it, in which case, I would definitely not want to take the risk of a novel vaccine. Whereas if we haven't had it, I would be much more inclined, you know, I would like to know something about how risky It is thought to be. But I know full well, that without following people, for a very long, extended period of time after such a thing, you can't know with any certainty that what you're dealing with a safe, I'm dealing with a calculated risk.

**Heather** 20:38

There's also the question of what, how much does taking the vaccine lower your risk of contracting the disease. So a vaccine is never 100% protection. And for instance, I think it's the cholera vaccine, which Brett and I have lived and worked in places with all the tropical diseases you can think of, and have considered all the vaccines and we certainly got yellow fever, and we needed it and variety of the others never got cholera vaccine, in part because cholera affects you if you do not have access to fresh water, and we were always in places where we would be able to get fresh water. But more to the point that cholera vaccine has an efficacy that is so much less than 50%, that the risks of the vaccine which there are always risks to any drug that you will take seemed far higher than the benefits of taking the vaccine. So built into the answer to the question about how concerned you would be about taking a hastily developed and tested vaccine is what are the people who've hastily developed it think its efficacy is?

**Bret** 21:39

All right, thoughts on Oh, so this is Nate asks thoughts on creating a tax sheltered disaster savings fund like the HSA or IRA to encourage companies and individuals to create nest eggs for these types of situations, and mitigate the need of bailouts borrowed against the future. These are good ideas, what I would say is we need some system. And I can't see how it does not emerge from either an incentive that is built by a large governmental structure that is not sensitive to the lower level game theory, or deployed by government itself. So these ideas may be good ones, what I would like to see is the most effective ones at the least cost. And really, what we need is very smart people who are broad minded to engage the question of what is the best way to protect against plausible crises? You know, and how would it be constructed to resist capture it, for example,

**Heather** 22:42

and the game theory enters again, too. So the wording here is creating a tax sheltered disaster saving fund to encourage companies and individuals to mitigate the need for bailouts. Well, if companies have been encouraged to create these things, but bailouts may still be coming because the government tends to do bailouts, then those companies that that contributed to such a thing may actually end up failing because of their good intentions. Right? So there, there needs to be some way to make sure that those people who actually would those those corporations, and those individuals who actually did save for the future, did not take a hit because they were saving for the future.

**Bret** 23:25

Yep, that's a that's a really important point. The cost of the system has to go to those who put us at the greatest risk, not those who do the most to avoid that risk, right. Okay, Anthony asked, Can virus testing be done DIY, what is required? we've answered this, probably the test can't be generated DIY, but they could be potentially administered DIY and to the extent that's possible, it would be great to see it. Yep. Matt asks, needs more data regarding the viability of a bandana and then Jason, in the very next question, says a 2010 study in applied biosafety suggests 11% effectiveness for bandanas versus 90% for n 95 and 33% for surgical masks. I did look at this paper and at first I was thrown by that low number. I am not at all convinced that the methodology successfully models viral transmission and what I would really like to see I

**Heather** 24:23

want to know what effectiveness is I want to I want to know the definition of effectiveness if definition

**Bret** 24:27

of effectiveness had to do with aerosolized sailin solution. It's it's salt water, salt water being broadcast by a nebulizer that got through these things that is not at all the same as detecting whether or not a viral particle would be likely to make it viably into the lung or knows of a person who had encountered a cough. So my suspicion is that bandanas are far more effective. I would very much as you Jason would like to see The bandanna tested. And in fact, in our either first or second livestream, I mentioned that I was planning to run a small scale test of the bandanna before COVID-19 was ever a thing, I wanted to see how it was gonna affect cold and flu. And anyway, I'm still still hoping to see that data. But I do think the methodology tests something. But it is not clear to me that it tests the correct parameter to predict. In fact, the test was generated in part to model dust storm resistance, if I'm remembering the paper correctly, so what I would say is my test in which I took the bandana and I put it over a camera lens and came up with greater than 99% effectiveness at intercepting photons says one thing, this test is something else. But the gold standard is a test in which people wear these things. And we see whether or not they have reduced likelihood of contracting colds and flu.

**Heather** 26:02

Viruses aren't the same as photons. But they're also not the same as saltwater. And I will say we didn't end up talking about today but there's a 2017 paper. The the blurb from which is basically that if you salt your masks their work a lot better than if you don't sell your masks. Now, it's not quite that simple. And these these researchers were taking apart I believe it was n 95 masks and immersing the middle layer in salt water and then putting them back together and finding that they became effectively and 100 masks almost. And the idea there is excuse me, that upon exposure to a virus that is contained in a water droplet, the salt water basically, the salt in the mask, crystallizes or de crystallizes around the virus surrounds it and renders it completely useless. So it basically traps even more effectively to a large degree. The viral particles than than an unsalted mask does. Now I have no idea if you could salt your bandana and have the same effect you would at least chop your face for sure if you did so. Right or any of the masks this this sort of mask as well, right?

**Bret** 27:16

This mask which was made by your mom, yeah, this mask, which was which was made by my mom. Right?

**Bret** 27:24

So that's a washable cloth mask. So I feel certain that actually soaking it in salt would have the same effect because I

**Heather** 27:32

think it probably would, but you would end up with with skin issues, mostly. But so given given that we know that salt water has a distinct effect on viruses, throwing saltwater at masks and using that as the proxy for how viruses will move through those masks seems like actually a very poor

**Bret** 27:51

proxy. Yeah, I think it is a poor poor proxy. I mean, it may be a very good proxy for their primary objective, which was to test for their ferocity with dust storms. But in any case, all right. Nor Drea says good job to Zach. I would just say For our part, we also are very fond of Zack, we regard him as a keeper, as is his brother. And anyway, we're grateful to him as well. Let's see.

**Heather** 28:22

Seems like wokeness has taken a backseat during this age of COVID. Do you think once this is over, we will revert back or mature past the silliness. I'm afraid we're gonna revert back.

**Bret** 28:33

I've wondered the same thing, Jesse, it's almost hard to imagine people going back to bickering about it. So anyway, maybe maybe there is something to that.

**Heather** 28:42

Maybe, I guess, I doubt that it will disappear entirely. I just don't see that happening. It's so entrenched in so many systems at this point. But we can hope that some number of people who were deeply woke have will have lived through this and have seen what intersectionality and the and the progressive stack and all of these ways of thinking about the world were able to do for them under this time of global pandemic and maybe emerge with a more skeptical view. So that maybe perhaps the woke army will be a few soldiers fewer when we when we emerge from all of us.

**Bret** 29:21

All right, Nate asks, If stories of the CCP destroying samples lies about transmission release of likely infected travelers buying and hurting of international supplies, etc. What consequences should they face? Well, unfortunately, we are stuck with a bunch of contingencies here. Are the stories true? Are they partially true? Are they being spread by people who have other reasons for sowing disinformation? Don't know, what consequences should they face? Well, in an ideal world, one thing in a real world where you have to deal with the fact of the CCP being A continuing player, them effectively having tremendous power over us by virtue of the fact that virtually every supply chain, including vital stuff, like computer chips goes through China, given the reality of the situation, I don't think figuring out what would be deserved in the event that these stories are true is a very productive line of questioning. The line of questioning I would like to see us engage is How the hell do we render ourselves less vulnerable the next time given the situation that we find ourselves in? It's an important important question. Okay, what are your thoughts on the problem of combinatorially inflation for the origins of species? You still believe in Darwinian evolution? Yeah. So I don't believe that combinatorially inflation is an actual challenge to the origin of species, I do believe that to find it. Not really, I want to it's basically a mathematical challenge that there's too much possibility space for Darwinian selection to account for what we see, I do think that the modern version of Darwinism that we teach is broken in a couple of ways. I do not regard that as a flaw in Darwinism, because I believe that the solution to the flaw that we have is more in better Darwinism. In other words, I think Darwin got it right, in part, by virtue of the fact that he couldn't address details and so gave a broad picture. That was correct. But the mechanistic details, I don't believe we have the full story yet. I don't believe we have a powerful enough version of the story to account for many of the things we see, which is creating false hope for many of the people who think Darwinism is broken. But I would say, ironically enough, when it comes to Darwinism, keep the faith you'll see Darwin was right. Okay, where are we?

**Heather** 32:04

Any advice for people who have had a significant other hospitalized? It's hard, since you can't visit?

**Bret** 32:12

Yeah, I don't know how possible it is. We have not been in the situation, I would say what you want to do is figure out a mechanism where you can stay in contact, I think, you know, I've read some terrible stories about people dying alone, because their families couldn't visit. And really think ahead of time about how you will stay in contact and see if there's not some mechanism, I would love for somebody to solve, solve the question, indeed. Okay, what

**Heather** 32:43

do you think current problems have to say about religious prescriptions on certain foods?

**Bret** 32:50

I think I think the question is about some kind of precautionary principle where the deity is thought to be finicky, and therefore would probably frown on eating exotic things from other places, right,

**Heather** 33:04

but which, which we would call, you know, in our language. These are often literally false, metaphorically, true dietary laws like kosher and hello and such, which have made terrific sense in the environments in which they evolved and stuck. And some of them may make less sense. Now in the age of refrigeration, for instance, pork is no longer going to give very many people a tricky gnosis. But certainly religious prescriptions on anything that have been persistent that have that have endured through time, and through some cultural change, had some adaptive function, that we should be careful about abandoning until we know whether adaptive function was.

**Bret** 33:46

Yeah, the problem is that these rules to the extent that they are sensible, which is liable to be a great extent, there is no guarantee that rules that were sensible continue to be in such a novel era, and there's no guarantee that things that should have rules against them will be found in these texts, because the texts evolved in response to a prior world that we just don't live in. Okay.

**Heather** 34:10

Next question, is Jack's testing vaccine number on primates yet are at not sure what this means?

**Bret** 34:18

I hear Let me take a swing at it. There is talk about using micro seabass, the mouse lemur as a new model organism, I would say I don't think it is up and running yet. It is potentially useful. Also, there's there are ethical considerations about using these animals. But I would say in addition to mice, yes, and in part in response to the fact that the mice have proven to be bad models. Now, the mice are bad models in some ways.

**Heather** 34:54

They could be fried microsim isn't nearly as fast. Well, I don't

**Bret** 34:58

know how fast you could breed microsim won't be as fast as mice, but it could be comparatively fast because they're so tiny. This is an animal we've had experience with, they were all totally adore. And Heather's field site in particular had many little little

**Heather** 35:11

primates, not monkeys, so they're the smallest primate.

**Bret** 35:15

But in any case, the danger if my telomere work is right, than taking any small mammal and breeding it for profit is liable to produce exactly the same teal americh flaw, because you will end up breeding young animals to escape the cost of senescence. And when you do so, you will select for the same problem as we've seen in mice and hamsters. In chickens, and some others be rats. So anyway, I don't know if that's what you're asking about. But if it is, it's a real problem.

**Heather** 35:49

What do you think would be some ecological impacts of eliminating species like mosquitoes, ticks, fleas and other species with similar detriments? Well, let's just take mosquitoes for the moment. Mosquito isn't a species, it's probably 1000s. I don't know, actually. But it's at least hundreds of species. And most of those species are not known to vector any human diseases. But they are known to feed an entity to be the primary food of many other species, which then are low in the food chain, which are the things that eat and so you, you take out all mosquitoes, which would be frankly, impossible throughout the world. And you will collapse ecosystems, because there's nothing for the things at the bottom of the food chain to eat. I know less about how many species of ticks there are certainly not as many as there are mosquitoes. Fleas is probably a smaller clade yet. Each of them obviously vectored diseases that have killed untold numbers of humans. In each of the cases, I know less about what fleas and ticks are doing in the ecosystem in which they live. You know, obviously, things are eating them. Frogs are probably depending on them to some degree, but I don't think ticks or fleas comprise as huge proportion of say many species of bats diets, as mosquitoes do.

**Bret** 37:14

Yeah, although it's only certain bats, but it's a hard question to answer. I think, eliminating particular species that have devastating impacts on human well being might worth be worth the cost, indiscriminately eliminating creatures that seem like the ones that are transmitting these diseases would probably be a big error. All right, so that was Tyler's question. Phil's question, how about backs proximity to humans living in barns and houses, and livestock for blood cell? So this is a good question. I would say

**Heather** 37:53

yes. To the rest of the question, since we know what it is, but you didn't say it out loud as features adding to violence?

**Bret** 37:59

Yeah. So we've seen with, for example, rabies in vampire bats, that this has become a serious problem, but it is actually human caused that vampire bats are actually exceedingly rare creatures in their natural environment, because blood meat, blood meals aren't all that common in tropical forest. When humans start raising livestock that is effectively sitting ducks for these, these vampire bats, we create an opportunity for these pathogens to circulate in a way that human beings can encounter them. There's certainly a question about entering caves that would otherwise have been impassable as a result of them being too dark. So there's all of these dangers. And then there's also the other question, which is human beings interacting with these species may be transmitted transmitting the nose fungus that's killing so many, so many animals. So anyway, the bottom line is that you have a world of pathogenic phenomena. And then you have human beings behaving in novel ways that are causing new opportunities for those pathogens to circulate. And it's been bad for humans, and it's been bad for these creatures. And, in general, we need to start thinking about not simply innovating because we can and then discovering that the downside of it is causing animals to go extinct or human beings to die by the 1000s or millions.

**Heather** 39:34

That's right. And we should also say that, you know, blood sucking in bats is restricted to three species of bats. It's only three species of vampire bats out of well more than 1000 species right and is it only one of those that's actually a mammal specialist and two are avian or the other way around? Yes,

**Bret** 39:48

there's only one of them is a is a mammal special. So

**Heather** 39:51

one species of Bat Out of out of 1000 1200 1300 or says motors.

**Bret** 39:57

rotundus is one and it doesn't care. Occasionally, and it gets a lot of humans.

**Heather** 40:02

It gets up into this very southern part of the Southern us, I think, but it's a new world. You're maybe right. It's mostly not in the US,

**Bret** 40:10

I think. I think it's not in the US. It's you know,

**Heather** 40:13

it gets up into Mexico. Yep. And down through, I guess the Amazon. Yep. It's not in the old world. Yep. Right there. No, no vampire bats in the old world. Interesting that the story of vampires shows up in the old world.

**Bret** 40:27

Yes, was why vampire bats are known as vampire bats. It's the old world story having been grafted onto bats in the New World, along with the epithet vampire, which shows up in many of the Latin names for bats that don't ever drink blood, empresa

**Heather** 40:43

and Pyro byram

**Bret** 40:45

Yeah, all these bats. But okay, where are we?

**Heather** 40:50

Second one down? Brett, have you? Have you and Eric spoken about the overlap of mathematical functions and epidemiological biology? And what can we learn from this? What's his take?

**Bret** 41:00

suggest asking Eric, or maybe I should have him on? And we can answer that question. I mean, obviously, all of the stuff is possible in mathematical terms. I don't know. I mean, this question is really about the interface between what we think about and what Eric thinks about, I don't think we're capable of answering it on our own.

**Heather** 41:21

On the podcast with Eric, you, Brett said that you need a pen and paper to explain the genetic complexity of your social behavior and ants, when can you make it? So I, I used to do this a lot when I was teaching animal behavior. I love it. It's a lot of fun. We're not going to do it for a bit, but we could we could, we could start doing little technical bits like that. Yeah. It's tremendously fun. And, you know, the takeaways are your sisters, or your four sisters are three quarters related to one another. And males don't have fathers. Those are a couple of the takeaways.

**Bret** 41:55

If you're an act, if you're not or A, B, or B. Okay. Let's see. Time. Tune in drop out says time important timing, more important. Looking at the situation in Hong Kong with riots and protests, the degree to which this virus was able to clear the streets simply cannot be dismissed as coincidence? I would not say it cannot be dismissed as coincidence. I would say it raises a question about whether it could be something else. But the fact is, if the virus is plausible on its own, and protests happen, and the way they would interact, results in the clearing of the streets. We don't know what it is. Presumably, it is. It is mere coincidence.

**Heather** 42:41

Regardless of initial circumstances, would you say the CCP has weaponized the circumstances through their allegedly deliberate deliberate cover ups? That certainly worsened impact around the world?

**Bret** 42:51

You know, Nate, but

**Heather** 42:52

I circumstances,

**Bret** 42:53

I wouldn't say that, because I think the role that China plays with respect to producing the goods that keep the West running, they could be doing things far more devastating than what we have so far seen, doesn't mean they won't, but I don't think we can regard them as putting the pedal to the metal with respect to using this crisis to harm us. I think so far, that's just not what we've seen. Yep.

**Heather** 43:27

Following permafrost, releasing ancient viruses is a real threat or websites just posting clickbait. Both, maybe,

**Bret** 43:37

I got to say, stranger things have happened. But I wouldn't bet on this being likely because a virus would have to survive intact in the permafrost over such a long period of time. Now, of course, permafrost is the right place if you're going to try to preserve it for a very long period of time. But

**Heather** 43:59

viruses in general aren't understood to be extremophiles, right. So extremophiles, organisms that live in places like the high sulfur pools and Yellowstone, or deep and deep in the abyssal plain in the ocean, can deal with extraordinary circumstances for long periods of time. Viruses in general aren't known as extremophiles. But that's not to say that there aren't some that are possible. Well, they have this, this strikes me as possible. I don't know of any examples of it. Right, the idea again, to thawing permafrost releasing ancient viruses, I don't think that we have actually seen any examples of this. On the other hand, maybe you'd have to have been there to know that that's where a virus came from. Well, on the other hand, you know, with we can match up this virus to known viruses in bats and say, yeah, we're pretty sure that this came from one of these clients of bats. And that says, actually, it's not the permafrost in this particular case. So

**Bret** 44:56

I would say there are two other things one, because the viruses have dispense with the cells that make them do their work. They're more capable of becoming extreme files because the things that would break down under extreme circumstances are largely not present. But just as meat that is in the market dead, even if the animal was sick, when it was alive is very often not in a position to transmit a virus because it isn't coughing, for example. permafrost is even less coughing. And so to the extent that some virus was inhabiting mastodons and got frozen in the permafrost and remained viable, it still doesn't have a good path to get into a creature. So I would say, rule of thumb, don't eat yellow permafrost, you'll probably be alright.

**Heather** 45:44

Excellent. All right, we're still live by?

**Bret** 45:47

Yes, I think so. So

**Heather** 45:49

so many of our norms, institutions of trust are predicated on preventing or punishing bad faith interactions. The threat we're facing doesn't require bad faith to cause harm. How do we recalibrate that from the steel man podcast?

**Bret** 46:01

Yeah, it's a great question is, well, this is what human beings do. Right? We take novel situations, and we adapt ourselves. And if you think about how this will have functioned in the past, we have narrative stories to deal with. phenomena in nature, that have nothing to do with intent or anything like it. And so the ancient way to deal with this would be to encode it in some kind of a story where we, you know, fashion, some, you know, enemy spirit, the modern way to do it would be to get over that and say, Well, this is a phenomenon it has this nature, there's these game theoretic theoretic obstacles to us dealing with it well, and, you know, to encode the literal story, so I think that's the answer is we have to figure out what the literal story is, and then we can teach it and begin to discuss its meaning.

**Heather** 47:00

Well, I guess so you know, I said this thing, I guess, at the end of the last podcast about not being interested in taking pre modern or postmodern questions or approaches, and only taking the modern one, but your framing there of the narrative apparatus that all humans seem hooked into, and particularly likely to be compelled by even when the narratives are wrong or misleading, could therefore be seen as pre modern, but I prefer to think of it as one of the many things that are evolutionary and I don't, I don't think that a majority of people will be just as compelled by a linear description of facts, as they will be, by those facts embedded in myth, or allegory, or parable, or a good science fiction story or any number of other things. I think that there has to be a way to do what we need to do through narrative as well.

**Bret** 47:55

I don't disagree. But I do think our tools are better to a understand the underlying mechanism and be to convey it and you know, we're watching the world, talking about fairly deep issues of neurology and epidemiology, and mechanisms of infection. And, you know, one of the things that actually impresses me about the situation is that, given something that has focused our attention, people are many of them at least ready to level up and have that discussion. So I'm not arguing against narrative, but I am arguing that some things just don't lend themselves to it. It's true. All right, where are we

**Heather** 48:32

do? Thanks for addressing conspiracy hypotheses. Great term. We're doomed if we stop questioning, discussing the gen, the gated institutional narrative, especially during crises. So a comment, and then a question. Thank you. Could the worldwide fragility we are now witnessing due to COVID-19 help explain the Fermi paradox. Yes.

**Bret** 48:51

Yep, of course. Absolutely. The meaning being, why is it so quiet out there in the universe? Because there are things that challenge anybody who evolves to the point that they may be maybe something other than quiet? So yes, that will be game theoretic flaws and the fragility we are seeing as a natural evolved phenomenon one we have to get over or we will perish from it.

**Heather** 49:13

Yeah. Non anti fragile civilizations do not go Interstellar. Yes, they do not get into the future. Alright, are you familiar with the Hendra virus? It is a horse to human transmissible disease originating from bats. terpenoids It's mega bats in Australia. I do not know the Hendra virus Do you?

**Bret** 49:32

I don't and the idea that tarapoto IDs have given a virus to horses How would that be? I mean, I guess maybe so tarapoto IDs are plant visiting bats of the old world.

**Heather** 49:44

The flying foxes,

**Bret** 49:45

flying foxes are incorporated and tarapoto D. These are non echolocating. Very often roost, not all the species but many of the species are roost outside and trees. So Wow. I wonder what the theories. I will say this though, the conspicuous part of what you've said, the tarapoto D are bats and the only placental mammals in Australia are bat natively. Some placental mammals have made it in to Australia, non natively, including things like the Dingo, horses,

**Heather** 50:20

cats,

**Bret** 50:21

cats, rats, etc. So, the tarapoto D, transmitting a virus to horses in Australia is a matter of one Australian animal transmitted in

**Heather** 50:33

dem Iris and in Devon and Australian and demick, transmitting to a human introduced animal the horse that that is transmitting to human, which is also human introduced is

**Bret** 50:44

also Yes. So anyway, it's a very interesting story. I will look into it and see if there's anything more to say. Yeah. Okay. m Lewis would like us to mention the Bretton Woods agreement, please and very important to fix the banking system. Heather and I will begin fixing the banking system as soon as we are done with this live stream.

**Heather** 51:04

He continues. Thank you, FDR. Thank you FDR. Indeed, I don't know for sure about Brett, but I will say that I'm out of my depth on the Bretton Woods agreement. I don't know what it is. So consider it mentioned because we read your read your question, but I don't know. offhand off the top of my head what it is.

**Bret** 51:21

Yes, it's an it's an agreement on the rules that keep industry and banking

**Heather** 51:28

from the New Deal. Or zepa. Yes. So

**Bret** 51:30

anyway, I hope I haven't said anything wrong there. I also feel like I should brush up on it a bit before saying anymore. Okay, Scott McCloud. Final question.

**Heather** 51:40

Well, final question from the previous Oh,

**Bret** 51:44

might the policies that drove the German economic miracle after world war two be given a fair hearing? What is the question even about?

**Heather** 51:53

I again don't know.

**Bret** 51:57

I can't. I can't. Yeah, sorry, Scott.

**Heather** 52:03

So let's, uh, there's another spreadsheet. Sorry. Yeah, you're gonna want to cut off now. Okay, so no more questions. So we're going to go through the questions that have come in at this point. But there's Zack tells us that there are a ton of them. And you're going to start showing them to us and tell people the questions they ask now we'll log in the next time. Okay, so any questions that you ask now, from now on out? We are not we just don't have time to address. Apologies. We may look at them. We find your questions. Very interesting. But we just we just don't have time. We don't actually I mean, we do live here, but we don't live here. We live here.

**Bret** 52:42

We don't use chairs.

**Heather** 52:45

No, we are still seeing the old spreadsheet. Yeah. Okay. We are holding on.

**Bret** 52:53

due to circumstances beyond our control, we are still looking at the old spreadsheet. So at this point, if we can't fix this, we will have to guess what your questions might have been? Yes. Can we do what? No, no, that's the old one. You jumped?

**Heather** 53:15

No, I think it's the new one. It's not the same questions. We just answered. That you're seeing Firefox? Yep. Nope, nope.

**Bret** 53:32

All right. We are experiencing technical difficulties, getting the questions that arrived after the first spreadsheet was created up onto the screen. Well, Zach, I just don't know what to be talking about. Well, how are you holding up during the covid? 19 crisis?

**Heather** 53:53

Oh, boy. That question, I guess. Yeah. I think I think we're doing pretty well. Right. I think one of the things. We've talked about the lucky position we're in here in the forest, with our children, when we love and spend time with and so we do have the new spreadsheet. Yes, we can see it now. But let me just finish saying that occurs to me that we're both sort of constitutionally able to deal with not being around people for long periods of time. And I was thinking about what happened when I emerged from my longest field season in Madagascar, the one that you weren't with me for and I had a field assistant with me. But when I came out, having been on this little island off the coast of Madagascar, where I was living in a tent, sharing a waterfall studying frogs. And it only had Jessica my field assistant and the two conservation agents the two Malagasy guys conservation agents on this island to speak to for five months, and I went to visit my parents who were then living in London, I found myself for the first time ever wanting to talk to people on the street. It was actually very hungry for human interaction and human conversation in a way that I hadn't ever known myself to be before. But the fact is, I'd spent five months, mostly tromping around the rain forest, and not just not interacting very much with people. And it takes a particular kind of personality. When I, when I used to teach animal behavior, I would one of the things that I was trying to do was show students through having them do field work, that the romantic ideas of what it is to stay wolves, which is just very, very hard, are usually not what it actually means to be in the field. You're alone most of the time, and you don't see your animals most of the time because they don't want to see you. So this, this situation we find ourselves in I think, is easier for us, especially than it is for the people who are hyper socially connected all the time.

**Bret** 56:02

That's true. Yeah, that's true. Although we do have pretty good tools even for them. Because we're connected through Oh, absolutely. Through the net. Yeah. All right. payday, handsomely. Thank you very much, who is asked us to hold hands and smile. And while in general, we do not engage in any sort of kink on this channel? we'll do we'll go this far. Yeah, yeah. Have you smile? I'm smiling. Really? All right, good. All right. Thanks, Pamela. Let's see Austin says rationality rules made a video about me recently. Okay. Well, if it was critical, then I must say I disagree with it. And if it was favorable, then thank you. rationality rules. Alright.

**Heather** 56:50

From the last topic regarding some closures, time to take up fly fishing the ultimate regenitive secluded activity here in Oregon. But from Cameron, yeah. If If you have land that you can find that you can go to that you're not going to be kicked off of. But yes, I don't mean to fly fishing for you. Certainly. No,

**Bret** 57:09

no, I think it's immoral since I don't eat flies. What? That was pretty good. Okay. All right. Yep. All right. Excellent. Excellent. Yeah. Math nerd.

**Heather** 57:24

isocaloric strength training. So you mean isometric? Maybe I don't know what isocaloric strength training is know what isometric strength? Okay, I so caloric strength training compromised your immune system during recovery? Not knowing what that is hard to answer the question, but it's like high levels of cardio do make you weaker and more susceptible to disease, high strength training and high cardio. You shouldn't be really, really pushing it right now, if you're trying to fight off or not get disease. But I don't know the technical term that's being used here. Do you

**Bret** 57:58

know I would say if isocaloric strength training is a real thing, then you should engage in it responsibly.

**Heather** 58:05

Oh, that's such solid advice. Thank you for it.

**Bret** 58:08

I think it is solid. Yes. Terrific. Have you heard of the broad spectrum antiviral Draco created by Dr. Todd Reiter from MIT have worked in vivo and been repeated. Please have Dr. Reiter on I must say, I don't know what this is in reference to I would love to look it up and figure out what's down this road. Thanks for the suggestion. Kevin.

**Heather** 58:35

We don't we don't know it. Yeah. 10. Awesome. All right, thank

**Bret** 58:38

on john 10. He says,

**Heather** 58:42

I need help understanding the NIH article titled A SARS like cluster of circulating bat coronaviruses shows potential for human avert emergence. Please check it out and answer the next live stream. I think this may be the one that I was referring to that I didn't have in my notes for this time. I if if that title is the right one, we should be able to find it. Just a logistical geek note. If you want us to look at a particular article give us the at least the name of the for the last name of the first author and the year in which it was published. And it won't have been published in NIH. That's going to be the funding agency. With that title, we should be able to find it if that is actually the title though. And, and we'll take a look. I think it is the one that I was referring to that, that that begs these questions in which there were a couple of authors who are associated who have their affiliation at the Wuhan Vera virology lab, you know, what were they doing? Why Why were they looking into other bat native coronaviruses? There could be totally honorable and upstanding and important public health reasons to do so. And of course, there could be the exact opposite.

**Bret** 59:48

All right, next question from Matt Erickson. How is putting the unhealthy first putting safety over productivity a good evolutionary strategy? What about the trail risks a new stream rather than playing it safe,

**Heather** 1:00:02

Brett? Yeah, yeah, explore remote.

**Bret** 1:00:05

This is a great question. Here's the thing. It's not a good evolutionary strategy. And there's a question about why we want to engage in a good evolutionary strategy. The good evolutionary strategy here might involve simply letting the chips fall where they may and being productive while everybody else is offline. Right? The problem is, people that you care about are going to die. And the fact is, the value that we have to each other is a proxy for an ancient mechanism for getting your genes into the future. But why the hell do you care about getting your jeans into the future? Right? That's what evolution cares about. You shouldn't care about it. It's an absurd goal. So what I would say is, the fact that we are putting safety over productivity is actually the best feature of our humanity struggling to emerge against our basest evolutionary instincts. Yes, we could take advantage of this crisis, but we shouldn't.

**Heather** 1:01:00

I don't think that the analogy to the trout, the salmon that risks a new stream, rather than playing it safe is quite right here. I don't think that productivity is the Explorer mode salmon that goes up and potentially founds a new population, but maybe at risk of dying and leaving no offspring at all. There There are two distinct questions here that I think are slightly falsely analogized. Okay. All right. Adam asks, any chance you guys would ever do an episode on the politics of the disease? For example, many niche substrates of anti democracy personalities are hopeful for extreme change. Appreciate you guys.

**Bret** 1:01:38

Yeah, it's a great question. And I don't think this is it's sort of next level. But how this is interacting with the political structure, the various strategies is a fascinating question. And it's one we have to wrap our minds around, or it's going to get the better of us. So yeah, it's a good topic, and we should figure out how to integrate it.

**Heather** 1:01:58

My friend doesn't get the common flu vaccine because he they hear things like it's not 100% effective. How can I help convince them? It is still worthwhile and disambiguate from something like COVID-19? Not sure what the second part of this disambiguate from something like COVID-19 I'm not sure exactly how that plays in. But, you know, the question, the question assumes that everyone should be getting the common flu vaccine. And, you know, we have a, we have a more nuanced take on this. You know, there are many years when none of us get the flu vaccine. I happen to have this year, the only one in our family who did and got very sick from COVID-19. Probably no relationship. But who knows. The idea that you don't take a vaccine because it's not 100% effective is obviously a crap argument that just that makes no sense. The thing about the flu vaccine that is tricky is that it is variably affected from year to year, and no one can make accurate predictions when you are expected to be taking the vaccine, how effective it will be that year. It's a question of How good was the prediction of the public health people in guessing which flu strains were going to be most dominant in the population this year? So not 100% effective isn't a good argument? It's I don't know you want to add something here?

**Bret** 1:03:25

Yeah, this is a tough call. The idea that it's not 100% effective is not a good argument against it, there is a individual versus population level question about costs. There's a question about how much we know about what the downside of routine vaccination is. And I actually think this is a complicated question and every button in which most people think they know more than they actually do know. So how do you convince your friend, first of all you would want to establish that you understood much better than they did? And then you would want to know something about about downsides that I think we don't know.

**Heather** 1:04:11

Yeah. What is there besides COVID-19? That could get us as bad or worse? Are you prepared for any of those? Could you make a list of 10 most wanton wonder if you're talking about pathogens in particular, or, you know, across the board, existential threat and such? There are, there are many things that could guess most of them we don't have names for yet. Over in the, the pathogen space.

**Bret** 1:04:35

Yeah. I mean, it's sort of a it's a difficult question to answer because evolution is so darn creative, that it can have generated all manner of horrors and trying to speculate on what they might be, is I think a fool's paradise, but let's just say, as bad as this is An awful lot of people seem to get it and have no symptoms, which means it could be far far, far worse without invoking anything really interesting at all. Okay,

**Heather** 1:05:13

do you predict far right politics will be supercharged and countries most affected by COVID-19? Because the right is more sensitive to disgust response. fascinating question. Yeah. Really interesting. And so this the contingent part of the question is, or the assumption and the question which is true as far as we know, is that the right that conservatives tend to be more sensitive to, to tend to respond in greater degree to disgusting things? And this has been repeated several times I think in the research I think it's an interesting hypothesis hadn't occurred to me I guess there's a question of whether or not this is viewed as a disgusting disease you know, it's not a stomach bug. It's a GI bug, which tends to evoke disgust response Yeah, coughing does not tend to evoke disgust in the same way obviously being hooked up to ventilators and respirators and such you know people very ill in hospital can invoke can provoke the disgust response but the disease itself is less disgusting I think than many Yeah,

**Bret** 1:06:21

I could also see it going the other way because since there are very few solutions at the individual or small group level here, this is going to reveal the necessity of of properly functioning governance and that could take us to the left and I hope if it takes us to the left it takes us to a a new and better left rather than a backward looking version of progressivism Yeah. Okay. Okay. Yeah.

**Heather** 1:07:01

Why Why didn't I take your name? Yeah,

**Bret** 1:07:03

why didn't you take Yeah,

**Heather** 1:07:04

said said with affection. I

**Bret** 1:07:06

think I've more affection for you than me though.

**Heather** 1:07:10

Okay. So I'm going to see I've seen a version of this question I started seeing a version of this question after you broke into the public eye. When evergreen blew up and you were on Rubin and then on Tucker Carlson and such and the few people I saw it from it's it struck me as very very right wing and regressive and pre modern and you know, there's there's a lot behind the rules and culture around who when when hetero couples get together and make families what what the rules are where do you move? It's a question of locality Are you matter local? Do you move to the wives the wife's home or village? Are you Patra local, you move to their husband's home or village, are you matrilineal and you tend to track families through the the woman and in those cases, you would tend to track the woman's name or your patrilineal, you tend to take the man's name, who tends to have the power, matriarchal versus patriarchal. All of these are good, solid anthropological ways of tracking how power a name and resources and people move through time and space. And we live in a moment that is, in which many of the historical ways in which women actually haven't had the ability to live to their full potential or breaking down. It's good. But what it means is that some of the simple systems that were kind of functional are also breaking down. So it was certainly easier to track families when everyone in the family had the same last name. And here I live in a house with the three people I love the most in the world. And three of them have the same last name and I have a different last name, and none of us are confused. But it is it is occasionally confusing out in the world. And yet, I inherited my father's last name, and it was who I had been for 20 years. However old we were when we got married 2829 years of my life and the idea of being sort of having my identity switched from the one that I inherited from my father to the one of the man whom I loved and was marrying. Didn't seem like anything I had any interest in doing. So does that sort of not third wave, not fourth wave but you know, honest, feminist approach to imagining that women can do can make a difference in the world in the same way that men can confuse extent systems it does. It's not a perfect solution. But you know, we never considered hyphenating our names that would have been a disaster. It was just a decision to maintain our individual personalities and identities while also creating a third one, which is the combination. I had to make a joke, right?

**Bret** 1:09:57

Yeah, my part. I'm just you know, It matters to me much more that you do what I say. Oh, sure, then take my last name. So anyway, I got what I wanted. All right. Is it possible that the theory of dogs self domesticating, by eating our garbage could be related to the fact that we tend not to share diseases? I suppose I don't like this self domesticating version of the story at all Something happened, but self domesticating is not is not the right way to think about it. You have more to say on that? Yeah,

**Heather** 1:10:32

just that it's it seems likely that dogs may have been domesticated multiple times. In which case it is also probably likely that whatever that domestication event looked like it was different in in the various cases,

**Bret** 1:10:46

I would say our dog self domesticates every morning every morning. Yeah. There were a lot of different domestication events. Alright, thanks for answering my questions. You've given me a lot to think about Nate, you're very welcome. Jimmy to toes says is there a way to use viruses as a way to combat bacteria? such as mersa? Yes. Or is it delivery for new cancer treatments? Yes, yes. Yes, of course, there are ways to harness these things. And in fact, where's my courage? Yeah, it happens. That evergreen Yes, this is going to come as a shock. evergreen had a bacteria phage lab, one of the premier bacteria phage labs in the US. And this cup came from that lab with T for bacteria phage on it. So anyway, yes, harnessing bacteria in order to get genetic material into cells or to attack. Bacteria is a great idea. The Russians were way ahead on that. So yes, there is hope down that road. Are we

**Heather** 1:11:50

lucky, the COVID-19 isn't as deadly and we at least we can build a better herd immunity for an even deadlier virus to develop. We are lucky it isn't as deadly as it might be. But any herd immunity that we long term build against COVID-19 will not work against any deadlier virus, unless it's the same thing that became more virulent. But in fact, what we see, I think always although I'm not, I'm not so certain about that. I'm not gonna say almost always, what we see almost always is the longer period during which a pathogen and a human are co evolving together, the less virulent the the pathogen tends to become rather than more.

**Bret** 1:12:27

Yeah. Okay. histrionic heroine asks, yes. Can we trust the Jax vaccine? round? Number two? Can you see emails from a PayPal transfer?

**Heather** 1:12:41

So this is the this was the person who asked about the Jax, the primate vaccines before? And I'm not remembering exactly what the question was. Sorry, I'm not speaking into the mic. I'm not sure what the question I'm not

**Bret** 1:12:57

sure what the question is either that Jack's vaccine round? Maybe I'm just unaware of something. And then can you see emails from Pay Pal transfer? Do you mean, can we see messages that come along with the Pay Pal transfer? Yes, we can see that. And we will make a point of looking. If you mean something else, not sure. You could send an email to support at Brett Weinstein dotnet. I will see that. Okay. Why? Josh wants to know, why does Eric always interrupt and browbeat you? Eric is my older brother. And he cares about me very deeply. And he's also a highly unusual human being with a very special set of skills. So we have a dynamic emerges from childhood and beyond. And I must say, I couldn't be happier with Eric is an older brother, even if I am not always thrilled with the position it puts me in, but but I really have no complaints.

**Heather** 1:14:01

Well done, sir.

**Bret** 1:14:03

Thank you. All right.

**Heather** 1:14:05

Would you take in a grad student outside of this box?

**Bret** 1:14:09

outside of this?

**Heather** 1:14:10

I'm not sure what the I don't know, we're not in a position to take grad students right now. But thank you. Yeah, appreciate your thoughts. I think we are there, you're

**Bret** 1:14:19

done. Well, it's chaotic, long and chaotic. But uh, hopefully there was a lot of worthwhile stuff there to consider. And we will do another live stream soon on Friday. On Friday. I don't know why Twitter seems very reluctant to show people announcements, at least when I make them. But pay attention to our channel here subscribe and like and then you'll get a notification through YouTube. Follow us on Twitter. You'll get notifications there if you if you go looking and we will see you next time. Be well