Bret and Heather 9th DarkHorse Podcast Livestream\_ Life and ...

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**SPEAKERS**

Bret, Heather

**Bret** 00:10

Hey folks, welcome to the ninth live stream on the Dark Horse Podcast. I am Brett Weinstein, I am sitting with Dr. Heather Hyang. To buy right. And we are going to discuss a number of things today, some of them directly related to the covid 19 crisis, but many of them taking a step back and looking at a bigger picture. We thought we would start today we have had a history of starting with corrections. I don't have an explicit correction this this time, but I did have an addendum that I wanted to make to something I said last time. The addendum is this, I said on the last livestream, I in fact made a not so polite request of our female viewers that they I think the way I put it was stop sleeping with assholes. And the idea was that that would make the world a better place. And I still believe that that is a an important ingredient. But it was quite incomplete. The fact is, there is a another side to that coin, which involves men, ceasing to focus on getting lucky without commitment that would also make the world a better place. So at some level, this delves into a discussion that you and I have had, among other places, we had a discussion related to this on the Joe Rogan program. And it involves two main ingredients. Basically, in some it is a renegotiation of the deal between male and female, something an alternative to the naive proposal that we see, in many places that effectively men and women are the same, but for some kind of patriarchal force that imposes difference on us. And that's obviously evolutionary nonsense. You said it with a straight face, though, well done. I did. Actually I do a lot of the most hilarious stuff with a perfectly straight face. I've noticed I have begun on Twitter to end my ironic comments with an emoji because I'm not really an emoji kind of guy. So people can tell I'm kidding, if there's an emoji. Anyway, the point is, it is time because so much about our situation has changed from the historical past where our original deal between male and female were was negotiated, it is time for us to revise that deal in light of the modern world that we live in. How we do that is more complex matter.

**Heather** 02:31

So it's, it's specifically what you're alluding to is some of the novelty of the of our modern existence, novelty, which is changing at an ever more rapid rate, something that we've come to call hyper novelty. And indeed, this is exactly the focus broadly, of our book, which will be out in about a year. So hunter gatherers guide to the 21st century explores how it is that evolutionary beings with a greater ability to respond quickly to change than any other species that's out there us with more in the software realm that is driving us than in the hardware than is true of any other species, how it is that we can persist, and indeed, be robust in the face of such change. So one of one of the chapters, I think, last time, we alluded to one of the chapters being about food. One of them is also about sex and gender. Another is about relationship and parenting. And, indeed, obviously a piece of advice that says, you know, half the population, you need to do this missus the other half of the population and for almost all such prescriptions, there is something that that both men and women could be doing.

**Bret** 03:44

Yeah, so for those who are scratching their heads over what we mean by novelty, and what effect it might be having just take the following example. The fact of technological birth control that is highly effective changes the the spectrum of risks associated with sex dramatically, especially for women who, in the past era, without reliable birth control would have faced a situation where if they had sex with a guy who was not ready to commit, or in a position to commit could easily end up stuck with a child that they needed to raise alone. So women, therefore were psychologically constructed to resist that hazard at all costs. To

**Bret** 04:30

be less interested, women are psychologically constructed, as you say, to be less interested in casual sex, and to be more coy to use one of the words that tends to be bandied about in evolutionary circles.

**Bret** 04:43

So now that women are in a position to control their, their reproductive output through technological means, that spectrum of hazards is altered, but what isn't inherently altered is the psychology of male and female that goes along with the sexual game as it Where and so figuring out how to retool our, our psychological apparatus in as much as possible for modern realities and how to understand ourselves as consequences of evolution in an environment we no longer live in because to some extent, some of these things are not psychologically easily altered. And therefore, coming to grips with what we've been handed and figuring out how to marshal it usefully in the modern era, is kind of the key to being a modern human.

**Bret** 05:30

Okay, before we leave this topic, though, let's not leave with the impression that being an asshole is the male strategy in human history, right? As as we've talked about elsewhere, and we'll continue to talk about we view it as there being effectively three strategies three male strategies that have been effective, although at least one of them is totally horrific. Alright, so one strategy that males have used to get their jeans from the future has been forced copulation or rape and no one condones that it's not okay. But the other two one of them is this you know, broadly speaking the CAD strategy the asshole strategy to use your language from before they'll love them and leave them you know, all of this looking for one nightstands, looking for opportunities to impregnate someone, and then have nothing to do with the resulting child. But of course, as we know emerging as most of the viewers and listeners here do from from cultures in which monogamy is a cultural norm. And for most of us a cultural value. There is a third male strategy, which is quite lovely. And which very, I don't know that anyone views it as the asshole strategy, which is a monogamous pair bonded, investing in children and helping to raise children strategy,

**Bret** 06:48

yes, and eventually produces technical help capable of mailing a complex podcast like this one.

**Bret** 06:54

So totally unforeseen consequences of the delightful certain we've got him laughing back there now. So

**Bret** 07:00

that's good. technical help, is laughing. But I would say actually, maybe we can move in the direction of a useful outgrowth of this kind of viewpoint, which is, being an asshole is a male strategy, so long as there is a niche for it at the point that it is no longer a productive strategy, it won't be one anymore. And so the whole reason that I gave the obnoxious piece of advice that I gave in the last livestream,

**Bret** 07:27

I don't think it's obnoxious. I

**Bret** 07:28

mean, it's, oh, it's deliberately, okay, I'm fine with its level of noxious ness. But anyway, the point is, look, we are all creating a landscape of opportunities for our competitors and our partners and creating a better landscape that rewards strategies that we want to see and doesn't provide sustenance to strategies we don't want to see is exactly what we ought to be doing. And amazingly enough, it's the very same thing we're trying to do with this virus that has spread across the world is we're trying to deny it, opportunities, and to effectively corral it by not giving it the conduits between here and there, and you and me and all of that, that it seems to have found. That's right,

**Bret** 08:14

we would like to deny all, their basest instincts. And for a virus, it's entirely basest instincts. And so we need to corral it into being less vigilant. And having having an ROI of less than one. And I'm not familiar enough with the R sub t that you that you were talking about last time. But if it's if the math is similar, you know, all of these methods of transmission we want to produce them and, and create pathogens that we can live with, as opposed to only die with

**Bret** 08:45

great Providence we can live with to the extent we've got them and not create pathways for pathogens we can't live with. And as long as we're on the topic, I would just point out same logic applies economically and politically. You see the strategies for which there is a niche, it makes no sense to get overly upset about whatever critter happens to have exploited and innovated in that niche. If you don't want to see the behavior, for example, political corruption, it has to be more costly than it is beneficial. At the point political corruption is more costly than it is profitable. You won't see it. So if you want to, if you want to prevent it, that's the way to do it. Good. All right. On to our next topic.

**Bret** 09:25

Thank you. We're going to launch us here. Yeah, I was

**Bret** 09:29

looking, we have done a lot of troubleshooting this week. So I am maybe not as ensconced in some of the literature that has emerged as I might have been, but I have seen some comments that caused me to think there is a place we need to return to. And in particular, I saw several comments one that struck my caught my attention very precipitously was a comment by somebody who had had COVID-19 had recovered, or was in the process of recovering still finds themselves very compromised in terms of their respiration. And saw my comment that effectively the damage done by these pathogens, gives a person a giant shove in the direction of death. And he was lamenting the fact that maybe this meant that something very serious that occurred from which there was no escape,

**Bret** 10:29

this emerges from the conversation about the the binary idea that you're dead, or your perfect is, is wrongheaded. And we should be adding nuance to that conversation.

**Bret** 10:40

Yeah, or I would say you are sick or you are recovered is the place where the binary is particularly misleading. So let me step back a second and say that what we're about to talk about emerges from work I did a long time ago on telomere some of you will be aware of that work. It was discussed extensively on Eric, his podcast, the portal, Episode 19, we talked about the telomere work and what it had been. And we're not going to go deeply into it here. But I will say that the basic model involves the fact that on the ends of our chromosomes, you'll remember from wherever you learned about chromosomes, that our chromosomes are linear, they are a line of genetic information. And at the ends, both ends of a chromosome, you have a repetitive sequence, that it's not a gene, it doesn't contain information about how to make a protein or anything like that. It is just a repetitive sequence that has a particular number of repeats. That's called the telomere. And that number of repeats, it happens in creatures like us decreases every time a cell divides, our cells basically have three reasons to divide, they could divide as a result of your growth, you're getting bigger, you need more cells than you've got, it could divide as a result of maintenance where some cell is replaced by another cell that does the same job. Or it could happen when you have a need for repair. So if you've damaged something, and you need to grow more, you know skin or whatever to fill in a cut that you have, all of those things will cause cells to divide, and in almost all of your tissues, a loss of telomere. So that loss of telomeres, what I worked on, and the upshot of that work is that the telomere loss, which appears to be associated with what we colloquially call aging, what we scientifically call senescence, that is the degradation of your function with age that that loss appears to be an adaptation, and the adaptation is preventing tumors. So we have growths where a cell has gotten, it has become broken as a result of mutation, some of those ways that a cell can become broken would cause it to reproduce without reason. If it reproduces without reason long enough, almost no matter where in your body a cell is, it will crowd out something that you're depending on and you'll die. So you know, creature like us that might have 30 trillion cells, every one of those cells that is capable of replacing itself is also capable of duplicating too much and many of them can kill you if they do it. So a counter that limits the number of times a cell can divide is a protective mechanism that would appear. And the downside of it is it limits the amount of maintenance and repair you can do, which causes us ultimately to have to die of the failure of an organ. So we sort of exist between these two hazards cancer on the one hand, and organ failure on the other, and these things are balanced. And if everything goes well, you live a very long time as a result of that balance. But nobody gets past 120 120 years, I don't know 20 years, yeah, that doesn't mean nobody will ever get past 120 but the your prospects get so bad late in that sequence that you know, somebody lived 223 and you know, maybe they have but it you know, it doesn't say that we're on the brink of something new it just you know, he large population, you'll get more outlier space,

**Bret** 14:19

just just to be clear, you're stipulating very clearly and strongly, that there is not going to be a panacea for the the outer edges of the human lifespan, that we're not going to end up living to 200 or 1000 or otherwise, breaking this barrier of approximately 120 years is how long humans at the outside can expect to be able to learn to be able to live.

**Bret** 14:43

Yeah, I don't want to say it couldn't happen. I mean, that's the kind of thing you know, if you start speaking that way, you end up looking like a fool but in this case, the the things that are arrayed against such an effort are so powerful. long standing widespread that I do not expect us ever to defeat human aging as people say. And I would just point out, even if we figured out how to do it for the body, you've got a problem with the way the brain functions. And the failure of the brain has very little to do with the inability of cells to replace themselves, because the cells in question are neurons, and a neuron may be connected to 1000 other neurons. So it's not the number of cells you have doing brain work. It's the conductivity of them. And so how that connectivity is deployed and lost over time and all of that, that's a whole different problem. And we really have no idea how to even begin to revise the brain to make you live longer. In terms of your body, we actually know right now how to get you to live longer than you will currently live. And it involves reducing damage, right? This actually works we are

**Bret** 15:52

but you're not talking about extending the life of the body beyond 120 years,

**Bret** 15:55

right? That is a fool's errand, I would say at this point. We can make you younger, longer, and we can make you healthier, and we can get you closer to 120. It involves reducing the amount of damage that you suffer. And that has implications for this commenter who was wondering, grappling with the implications of the disease that he has faced. And a lot beyond that. So what I was hoping to get to was, I should say, we have been living with this model of telomere based aging since 1998, or nine, Yeah, sounds right, something like that. So that means that we because we believe that this is a correct description of why the human body grows feeble and inefficient with age, not just humans, all mammals, birds, complex animals as a whole. Living with this model, we also have to grapple with the everyday questions of what to do and what not to do. And so anyway, we've learned a lot about what it's like to look through that lens. And I think what I'm hoping is that people will move past just seeing the downside of this, oh, my God, I've suffered damage. And start thinking about the upside of understanding this. So how to describe it. Imagine for a second that the grave is a place with something like a magnetic pole. And that that magnetic pole is very weak, when you are young and healthy, and it grows stronger, the older you get, right? The grave is pulling you towards it. And if you suffer some kind of body wide damage, you get a giant shove in the direction of that magnet doesn't necessarily push you close enough to the mag magnet that you fall into the grave, but it pushes you closer to it. Now that leaves you with an opportunity, which is well, I'm not happy that I'm closer to that magnet than I was. But I can take action so that my emotion in that direction slows down to compensate. And this has many implications for how one views health, I must say I have been scratching my head for decades now. Wondering why we look at infectious disease the way we appear to look at it, where you know, we treat infectious disease, almost as if, well, I was sick, and it cost me two weeks. Now I'm better. I'm going to pick up right where I was rather than three. I wonder how much damage that did I wonder how much of my total potential living I lost the capacity for? And ought I not avoid illness with the expectation that each of these things is actually shoving you in a direction you really don't want

**Bret** 19:04

to go. So there's a there's a balancing game to be played at all of these interfaces, of course, trade offs everywhere. But one thing that your little soliloquy there just brought up for me is you and I and we have for our children even more so avoid prescription and over the counter drugs absolutely as much as possible. Right when we're not feeling well, it takes it takes a bit to get us to take an aspirin or Tylenol, and for a long time emerging from your work, telomeres cancer and so in essence, we avoid the end sets the non steroidal anti inflammatory like ibuprofen, ibuprofen and Motrin and such completely for reasons that you can go into another time or now. But avoiding avoiding drugs that might reduce symptoms when the symptoms themselves might cause damage that would also accelerate aging means that there is something of a trade off. And so it is also true that fever, for instance, fever, and in the case of a lot of infectious diseases is not actually the disease but your body's response your body's adaptive response, as by now, I think many, many people have heard this, but but When, when, for instance, Nassim William's book, how, why we get sick, why we get sick, it came out in the mid 90s. Sometime, that was one of the claims and it was it was considered bold and new and maybe wrong, even at that point. And it's not that no fever is the is the pathogens work. But often it is the body's adaptive response. So adaptive response which can kill you, which can kill you, absolutely. But lowering a fever, in such cases, means getting in the way of your body's adaptive response, which is basically, you know, at a very rough, very granular level, raising your body's temperature above the realm in which the pathogen can survive and reproduce easily, for a long enough time to kill the pathogen and hopefully short enough time that it doesn't kill you. So one should not simply take a fever reducers at the first sign of fever, because the fever makes you uncomfortable, because a very good chance that the fever is actually your body, doing your bidding. On the other hand, fever does damage. So you know, there's trade offs, and all of these,

**Bret** 21:33

there are, as long as we're here. I guess it's getting pretty late. It's a little past 330 here on the Pacific coast. So the kids are already in bed, we can talk about the difficult stuff. Avoiding drugs is not a blanket prescription. And I would just I want to be careful here. You can straddle the gap a little bit with respect to what your tech and I would say,

**Bret** 22:01

let's say pharmaceutical and over the counter drugs. Yeah.

**Bret** 22:04

So let's talk about before we understood any of this damage model of aging. We did a lot of traveling in the tropics, and we ended up taking the kinds of drugs that one takes in the pursuit of tropical field work. We took Cipro which deals with pathogens

**Bret** 22:28

that are inside your gut. It's a broad spectrum antibiotic that is especially good for gi, I think urinary tract and skin infections.

**Bret** 22:35

Yep. And it turns out, you know what, it damages tendons and I believe ligaments. Yes.

**Bret** 22:41

So this, this may be another topic for another time, but just asterisk. I feel certain and the few doctors to whom I've mentioned it, feel pretty compelled that when I ruptured my Achilles tendon in, what was it 2013 playing ultimate with a bunch of our students, that that that rupture was almost certainly at least related in part to my having taken Cipro a fair bit and my 20s

**Bret** 23:10

fieldwork, and I busted an ACL playing ultimate some years before

**Bret** 23:13

that. Of course, the common theme, there is Ultimate Frisbee, but it's because

**Bret** 23:17

I stopped playing at this point, because it's obviously a bit dangerous. But in any case, we learned too late that the zipper that we had taken thinking that it was pretty close to cost free because simply wasn't. We have learned similar things about Benadryl. Benadryl functions differently, but it appears to be closely related to dementia. And a cumulative quantity of Benadryl taken over a lifetime is somewhat predictive of future dementia. So that's a case where again, we've learned that some drug that we thought was safe just simply wasn't erythromycin does heart damage. biotic Yep, and Said's do heart damage. So the bottom line is synthetic stuff carries a fairly strong risk of doing some kind of damage that you're not aware of. And at some level, it's pushing you in the direction of that magnitude of the grave.

**Bret** 24:18

So what about the woowoo seeming suggestion that botanicals are safer that drugs derived from botanicals, you know, aspirin that you can take now is certainly derived is synthesized in a lab, but it's derived from willow bark. Yep. And you and I prefer aspirin when we feel like we need to take such a such a thing. Yep. What I mean, I'm just I'm gonna feed you the question. All right. So you know why, why aspirin and not Advil?

**Bret** 24:47

Well, let's just first say there's nothing magical about botanicals, there's certainly innumerable toxins created by plants. Generally, they're what's called secondary compounds, which means They're compounds that have no value in the plant. They're not part of some pathway. But they're there to dissuade herbivores from eating the plant. They're there as toxins. And in fact, almost all of our medicines that we get from plants are toxins produced by the plant. And what we do the magic of these medicines is in Thai tration. And that is to say, so here's the quick and dirty logic. The plants are looking for ways to dissuade their herbivores, many of whom are mammals from eating their leaves generally. So they load the leaves up with toxins, well, what's a toxin? a toxin is something that disrupts the function of the physiology of the animal that would be eating, how do you disrupt the function? Well, an animal is a highly complex creature with, you know, hundreds of chemical pathways in it disrupting any one of them will reduce its function. And so in effect, plants have been exploring animal physiology by creating compounds that happened to disrupt some animals or bibury, and then amplifying their quantity modifying their shape, whatever it is, that makes them more effective, we can now borrow these molecules that interfere with animal physiology. And if you are, if your own pathway is poorly regulated in the down direction, some plant is out there amplifying that pathway, and we can borrow that compound and we can amplify that pathway to the key being titration the amount so

**Bret** 26:33

so whereas sucking on willow bark doesn't allow you to control how much what is it salicylic acid you're getting, a lab can control exactly how much you're getting. And you can know that you're taking the exact same amount as you did the last time, you can hope.

**Bret** 26:47

I mean, we do a bad job of this, the bottle says, you know, take two of these every four hours for an adult, but adults very wide degree in size. So it doesn't make a whole lot of sense. And we know historically, that massive errors have been made. Again, this is from an earlier livestream we did but there's evidence that the Spanish flu pandemic was made vastly worse by aspirin. Why? Because they gave quantities that would now be considered insane. So that very compound that is therapeutic and useful, is dangerous in high enough quantities.

**Bret** 27:23

So I'm going to partially answer the question I posed to you something I didn't hear in your answer yet, which is that we have we or our relatives, the herbivores, who might be chewing on the plants that have created the secondary compounds in order to deter those herbivores have a long evolutionary history with things that were the secondary compounds in plants. And that's not to say that some of them couldn't kill us outright. And some of them might kill us over time. And some of them might create hallucinations. And some of us might like those and some of us might not. But in general, we have an evolutionary history with them. And so once again, we've we've gone full circle back to this concept of novelty of hyper novelty, that something that is totally new that's been synthesized in the lab is something to be more wary of, because of the complete lack of evolutionary history that we have with it for exactly the same reason. That SARS cov. Two is proven to be so intractable, so difficult to figure on so many different domains, right? It's because six months ago, we've never met it, and it had never met us. And so it is it is figuring us out right now with not nearly as many of the tools as we have to figure it out. But we also don't have all of its tools. So we're we're coming at each other with different toolkits. And we are hoping to figure out what it's doing. But we are we are flying blind at some level. And the same is true when we get handed a new drug like Cipro, or erythromycin, or any, you know, any number of these things that are, as far as I know, completely synthetic and told, it'll be fine. We know that it targets this system in the body, you know, well, are there are there? Are there long term health effects? No, you can't know that, you know, the r&d maybe was a few years if if that and it doesn't, there's there's no way that we're going to spend 30 5080 years on r&d. Plus, it's too noisy, we would would be very, very difficult to know what the toxic effects of some of these drugs were. Whereas when a drug like well, digitalis comes out, which is based on which is derived from tell us is it some

**Bret** 29:34

Fox Fox club, yeah.

**Bret** 29:37

Fox, um, when when digitel starts being used, my for heart conditions. My thought is nobody nothing else. I trust that more than I do. The drug that is entirely synthetic that is that we are being told, does the same thing. Because we have or our close relatives have an evolutionary history with digitalis

**Bret** 30:01

That's true. I should say erythromycin will certainly have been originally derived from I don't know if it was a fungus or bacteria probably a fungus. But I'm sure it's made in a lab now, but in any case, there is something and it has to be it's it. This is a question. It's an art not a science, figuring out what molecules are less likely to be destructive of you than others is. It's a navigable landscape. And so for example, Benadryl, widely used as a sleep aid, even though it's an anti histamine, which is a basically a chemical inhibitor of a an immune pathway. histamine reaction. It is used it happens to be soporific. it induces sleep and So actually we ended up using that in the tropics where you sometimes you're in very uncomfortable circumstances covered and covered and bites and Totten. Yeah, anyway, knock yourself out. On the other hand, we find out decades later, it has it's a contributing factor to dementia. What about something like melatonin? Is melatonin likely to be safer than Benadryl? Well, I would argue it's likely to be safer, because we know what sort of molecule it is and why it's interfering in a way that is likely you can harm yourself, but what you're liable to do is harm your sleep wake cycle, rather than contribute to some other pathway. Why can we say that? Because Melatonin is a chemical that we produce ourselves. It's a chemical involved in the way our sleep cycle is regulated. And so we're effectively hacking our sleep cycle by utilizing a molecule by introducing it artificially at a moment when we want to go to sleep. But that molecule being one that we make is also one that we're capable of taking apart safely. Likewise, and again, we wouldn't be discussing this if the children were still awake. None of them are none of them are. If you take something like hallucinogenic mushrooms, right? hallucinogenic mushrooms are a molecule that a fungus is producing to dissuade herbivores, we argue in our book that it is psychologically dissuading those herbivores rather than poisoning them, it is horrifying them. And to the extent that the story is to tell without the language to tell them, right. And so to the extent that the experience that is understandably very frightening to you know, a deer that ate the wrong mushroom might be something that you could utilize in order to, you know, cross certain boundaries of consciousness that are otherwise not accessible to you. That that is not likely to be it's not designed by the plant as a, as a toxin. It's designed for a psychological effect, and using it to hack your own psychology is liable to be much safer than let's say, a designer drug that interferes with brain function in some unknown way. And causes yes, some effects but what byproducts? Yep.

**Bret** 33:10

So mushrooms versus LSD, say? And yeah, LSD is derived from Aragon, which is a fungus, but it's and it's usually available form. It's been synthesized, and had all sorts of things added to it as well.

**Bret** 33:23

Yeah. And there are a whole lot of these compounds that are not fully synthetic, right. Alright. So where we were headed with this is, what should a person who has become sick with let's say, COVID-19, had a severe case, and then recovered? How should they feel? And what should they think? And again, borrowing from our own experience trying to navigate this question of what do I do as a creature with a fixed amount of repair and maintenance that I can do over a lifetime, which I end up spending arbitrarily, if somebody doesn't wash their hands, and I get the flu from them, and I've been damaged, when I've recovered, I don't assume, Oh, I got away with it. You know, I was sidelined for a week. But I'm back. I think, Damn, that's a real setback. And I think as you get more comfortable with this model, what you realize is that this is like a bank account, a bank account that you're spending for, you know, at the point that you're wise enough to think this way, you're already an adult, so you're not spending it on growth, it's maintenance and repair. Anything you spend on repair is not left for maintenance, you're borrowing that from your future. So tuning in on those things, which are creating damage and learning to avoid them so that you have more to spend on maintenance effectively, if you can maintain yourself in a more youthful way longer into the future is just simply the smart thing to do. And so at the risk of getting a bit broken, So, I wanted to talk about some things that I have discovered far too late about myself that I think are useful, but I wish I had known them far earlier in my life. So the first one has to do with, I had a case of asthma that dogged me for my whole adult life. And we had tried virtually everything. to address it. We had gotten all kinds of advice from doctors, we had been told I was allergic to cats, which I probably am. But not all cats, right? Cats differ. We've been told that it was, you know, dust mites in the bedding, we've been told all kinds of things. And we've done all kinds of stuff, we actually took the forced air heating system out of our prior house with the thought that it was transmitting dust that I was sensitive to. And eventually, when none of this really worked. I noticed somewhere on the internet that people were reporting that they were having a reaction to gluten that was causing respiratory illness, basically causing asthma. And my thought at the time was no way at the time, I really wasn't even a believer in gluten allergies as a widespread problem. But since we had dried everything else, I decided, what could it hurt to take gluten out of my diet, and see what happened. And it didn't happen right away. It took a couple of weeks. But if I eliminated gluten from my diet for a couple of weeks, my symptoms got entirely better. And then if I reintroduced it to my diet, they went right back to where they were. And I went to the doctor, and I said, Can you test me for gluten allergy? It actually came back negative. And I said, What does that mean? And the doctor said, Actually, we see that a fair amount. People are negative, but they you should go with if it's effective to eliminate from your diet, ignore the test. What I later discovered the

**Bret** 36:56

great doctor, yeah, what a rare and great doctor, doctor response.

**Bret** 37:00

He was a great doctor, Dr. Scott, thank you. So what I discovered later was that probably in my case, it's not gluten. What I discovered quite accidentally was that my sensitivity is to wheat, there's some molecule in wheat. Now the only way I can avoid wheat is to you know, if I go into a restaurant, I say I have a wheat allergy, they scratch their heads. If I say I have a gluten allergy, many of them know what to do. So I talk as if I have a gluten allergy. But I'm almost certain that I do not both on the basis that the test comes back negative. And on the basis that Bombay Sapphire gin is certified gluten free. And yet I have the same reaction to it that I have if somebody gives me soy sauce with wheat in it, for example. So what is all we've inadvertently

**Bret** 37:47

run a number of natural experiments where sometimes you know, and sometimes you don't, but I do know that you've gotten something that you've ingested something that has wheat in it. And if I know and you don't, it's already happened. I don't tell you. And I didn't at first because you and I both are interested in know if there was any chance that you were tricking yourself, you were fooling yourself. And No, you're not. Yeah, you get the you get the symptoms every time.

**Bret** 38:17

And when we were on study abroad in Ecuador, where it's very difficult to avoid wheat completely there's just not enough awareness of where weed is and isn't. So you end up getting dosed with weed every so often just out of course and we had

**Bret** 38:30

two other two students as well who were very sensitive. So the three of you

**Bret** 38:34

Yeah, three of us would suddenly have the same reaction we'd had some meal together somewhere and suddenly we're all like Oh, there it is again, right. So anyway, all of these things begin to tell a pretty clear story about in my case, wheat exposure even tiny amounts of lead exposure are sufficient to trigger it. But the bottom line is my lung symptoms cleared up I would say 90% if I just simply was completely religious about keeping wheat out of my diet, and that was you know enough I basically it reduced my lung symptoms to a absolutely minor annoyance. What I have found more recently is that the minor annoyance actually goes away if I maintain my weight below 170 pounds, right so that's not an easy number for me to hit but if I can get below 170 pounds, I can go all winter with no cough whatsoever. Right And so my suspicion is this has to do with some kind of cytokine storm if you basically an inflammation if you that was body wide in the presence of wheat was greatly reduced by the elimination of wheat and can be further reduced by my maintaining my weight at that level. So The advice I would give is, you need to figure out, you know, this may not apply to you at all the things that work for me, but you are a system that you can tune into, you can figure out what in your diet might be triggering you by eliminating those things that are candidates and seeing what changes, and then introducing them back in and seeing if you revert.

**Bret** 40:25

One thing you haven't said, though, is that for many of these allergies, I don't think we have time today to talk about what we think why we think that there is such an increase in particular kinds of these things. But there are many of them, you can't just reduce the amount of say wheat in your diet to 95 to 5% of what it used to be, which is honestly what most people do when they go on what they claim are elimination diets, they end up having a little bit of something. And because their symptoms haven't cleared yet anyway, they don't notice. And so you know, people will say, Well, I tried an elimination diet and nothing got better. So I'm pretty sure it's not any of those things that I eliminated, but you really have to go to zero to zero to completely clear it from your system, or else your body is going to be if it is allergic, it's going to be sending up a response,

**Bret** 41:12

you need to get to zero, you need to figure out where there might be a leak that you're not aware of like soy sauce until you get the idea that for some reason soy sauce is almost almost ubiquitously has wheat unless you've specifically sourced wheat free soy sauce, you know, you've got to eliminate all of those things. And then you've got to give it time for whatever cytokine pathway has been triggered to, to turn itself off in order to detect what your physiology is like on the other side. And you may well find why it's not an issue for you, but something else might be. And anyway, the larger point really isn't about wheat, it's about signal to noise ratios, we live in a very, we are complex critters, our diets are more complex than any ancestor could have faced. That is to say they source things from all over the world, one person might be fine with this ingredient, you may not be fine, you don't know. But you have to get the noise level down. So you can begin to detect the signals. Once you detect the signals, then the point is, look, the game is simple. You want to reduce damage. If you do damage to one organ over and over and over again, if you damage your liver every night with too much alcohol, well, then eventually you might push your liver towards the grave if your liver dies, that's cirrhosis of the liver, right? That's what happens your liver is dying because it's exhausted a lifetime's worth of repair capacity. And you can die from that. If you can manage to keep your liver functional, then you won't die of that particular malady. But if you had a job that forced you to repetitively do one thing over and over again, if you were using a pick axe, mining coal or something like that your arms would age faster than the rest of you, because their capacity to maintain themselves would be exhausted early. Now you're probably not going to die of feeble arms, but you'll have arthritis, and it will be crippling to you. So realizing that damage is the enemy. The damage is another way of speaking about the magnetic force of the grave. And that, you know, to this person who made the comment about the case of COVID-19 he just recovered from Yep, you probably did get shoved towards the grave. How big or shove? Nobody knows yet. I really don't think we have the data on what the damage looks like for various levels of of symptomatology for this disease. Maybe it was a big fan of maybe not. But irrespective of what sort of shove it was. the right response is to tune in to what kinds of damage you're doing all the time, and to reduce them so that your rate of progress in that direction slows down and that you can definitely do so don't despair, chin up. Yes, it was shoved towards the grave, but we all get them and you got unlucky this time. It's now time to take charge of your level of damage and reduce it.

**Bret** 44:13

Very good.

**Bret** 44:14

All right. Are we

**Bret** 44:16

move on to a few other somewhat disconnected topics that we just wanted to talk about briefly? Good. 45 minutes. All right. I'm a bit of a follow up to the discussion that we had about the MIT subway study last time. With regard to routes of transmission. The subway study, as those of you who tuned in last time will remember suggested that subway is being quite packed. Even after shelter in place orders came down in New York City seemed to be a major route of transmission for SARS. cov. Two in New York City. Well there's a paper out, called indoor transmission of some Go to Qian at all 2020, which suggests the indoor transmission is far more likely than outdoor. And at one level that seems completely obvious, and yet also the shutting down of parks and beaches and of skate parks. And the admonition that when people are walking outside, they have to be wearing masks all strike me as suggestive that people do not have a nuanced enough model here that, you know, this stays six feet away from one another has from the beginning struck me as an insane number. It's clearly not enough, but it's better than nothing. And the, you know, mask yourself at all times, well, we don't mask ourselves in our house in case some virus happens to come in the window. So you know, there there is there are going to be nuances with regard to what is the best best move. So from the discussion of this paper, again, key on it all 2020. Here's a direct quote, our study does not rule out outdoor transmission of the virus. However, among our 7324 identified cases in China, with sufficient descriptions, only one outdoor outbreak involving two cases occurred in a village in shanku, henann, a 27 year old man had a conversation outdoors, then individual who returned from Wuhan on the 25th of January, and had the onset of symptoms Several days later. So they find through a combination of, of hospital records, and being able to track where people are and, and what the method of community transmission appears to have been. To find that being outdoors is actually somewhat protective. They don't use that language, but but I will, I will go ahead and say, being outdoors, if you're going to engage with other people at all is going to be far more protective. So for instance, in Portland, where we live, there is now one, as far as I know, weekly, farmers market open. And there's all sorts of alarm that I'm seeing about the idea of farmers market, because farmers markets are obviously often crowded places with lots of people exchanging money and produce on such liberals go

**Bret** 47:15

to them, so there's lots of hugging.

**Bret** 47:19

And it's far more likely, if people are being safe if people are keeping some distance, but mostly if people are masked, and if especially if we can reduce the exchange of actual bills, right, which is something that happens more at farmer's markets than in grocery stores at this point, few and far, very few people pay with cash at a grocery store. But many people including me pay with cash and farmers market. The farmers market, controlling for those other factors is actually likely to be safer, it's likely to be far safer to shop in such a situation. And I will just say that, while this paper looked compelling to me, it is consistent with the lead authors results from a paper from 10 years ago, which was called natural ventilation for reducing airborne infection in hospitals. But I think I may have referenced in our very first live stream here in which he found you want ventilation to decrease pathogen spread. But mechanical ventilation doesn't do anything close to the job of basically opening up windows on either side of a row.

**Bret** 48:20

So first of all, I just have to say, how is it that nobody has used routes of transmission? It's a marvelous pun for the title of a paper and nobody's used routes of transmission, subways, routes of transmission, I mean, it's right there. But I don't know how to say this next thing to people, I guess I'm responding in some sense to one comment I happen to catch to our last live stream, which had to do, somebody asserted that beaches have to remain closed, because there are no lifeguards to save drowning people. And they then asserted, closing beaches is good governance. And on the one hand, I do get it. On the other hand, I think one of the many really important lessons of the COVID-19 disaster is there are no adults, that apparatus that is supposed to be protecting us has failed miserably at so many different levels simultaneously. That means we have to do our own job of protecting ourselves. I do believe in good governance, I really believe it is possible and that it is necessary. But I also must say that to the extent that people fear the nanny state, I think this epidemic is showing us exactly what there is to be feared. The government telling you don't go out into nature at a point when your instinct might be to do just that. And then the discovery later on that in fact that might have even been up idemia logically the right thing to do, this is telling us something important. The fact is, you don't need a lifeguard to enjoy a beach. You don't need a lifeguard to go swimming at the beach, you do need to know what it means to swim at your own risk. And the fact is, this is dangerous. You and I have had incidents in our past where we have nearly drowned as a result of things we didn't understand about the places where we were encountering water, it's not a small matter. On the other hand, if you recognize that beaches existed before lifeguards did people swam at them, you don't have to go swimming to go to the beach. But if you're going to go to the beach, and you feel like you should go swimming, figure out how it is that you enter the water such that you discover the hazard before it gets the better of you.

**Bret** 50:50

We are living in unprecedented times, it is as if we have all gone to a different nation state with different levels of governance in place. So when we wouldn't when I would run study abroad for many years, and we ran our study abroad in 20 1516 to Ecuador for 11 weeks, I and then we would always spend a lot of time in advance, talking to the students about the nature of risk their relationship with risk. And what it means that we are now we are now going to be traveling not only to other people's homes, and other person and other people's home countries and homes, but also to places that have not been made safe by lawyers. And this is something that most Americans, most people in weird again, that acronym Western, educated, industrialized, rich democratic countries. Most people in weird countries who haven't traveled much can't really grok they walk around with sidewalks that are perfectly flat and smooth. And with everything watched out for them. And when something goes wrong, they think someone else here is to blame. Whereas if you travel widely, or right now, if you want to go to a beach, you should be expected to be able to take the consequences for doing so when there are there have to be lower safety standards in place.

**Bret** 52:20

So I want to not correct but clarify one thing there. I think people are gonna find your your comment about lawyers completely mysterious. So this is internal code. It is not that we are suggesting that lawyers are these angels come to make places safer. In fact, it is their very defects of character, the fact that they are constantly looking for people to sue that results in them making environments safer than they would otherwise be. By taking people to court. You know, your dad's probably watching Yeah, he probably is. But in any case, that is the connection between lawyers and safety. And the point is not you know, this can be a very good thing. The fact is, there's a phenomenon I'm about to get in, in cultural trouble here. But when we have traveled to Latin America, there is a phenomenon that we refer to and we've spent a lot of time talking to students about it before they get there. There's nothing pejorative about this, but there's a thing called a gringo trap. A gringo trap is like a hole in the sidewalk a

**Bret** 53:21

cavernous hole into which you can look if you stop often can't see the bottom

**Bret** 53:25

rebar sticking out of it right and the thing is in Latin America shingles and I'm sure it's not everywhere in Latin America, but in many places in Latin America as a result of economic disparities. Such things are much more common on the street, you would never find such a thing on a major American street without you know cones and things that would warn you about it. So a gringo can find themselves falling into such a thing because they've grown up in a world that's that's so safe. And you'd really need to be alerted that you probably ought to not walk down the street looking at your phone because you never know what rebar hole you might fall into.

**Bret** 54:00

I'm reminded actually of mirkwood we were in Quito on our last study abroad trip with 30 students and our two children. And we have to hop back to Quito in Ecuador. Ecuador is an incredibly amazing and diverse country but it's got really the one big hub so we were back in Quito middle of the trip to do laundry and to get to our next place. And we were standing at this intersection I feel like must have had like 17 streets coming out of it. It was probably only five or something right? But we saw this little kid like four years old, maybe maybe three like definitely younger than five, this little kid come out of this building, clutching some bills. And he navigates across like three different streets with three different lanes of traffic goes into a coma dollar or no I'd like a panda gets, I don't know some fruit, maybe some bananas and papayas comes back out, navigates the back and presumably goes back into his apartment where his mom or his dad or someone is is who's waiting on the fruit that they sent him. To get, and we're sitting there going, Wow, we could barely trust ourselves much less our children who are far older than that kid to do that. On the other hand, on the other hand, at that point, we could trust our children in the Amazon, right? Because they had experience in the Amazon, whereas this kid and keto probably had never been out of keto. So it really is about your life experience. And most Americans have grown up in a world where they have become dependent on on the invisible lawyers who've made the world safe. And so no, the beaches don't need to be closed down. People need for can grow up already.

**Bret** 55:34

Yeah, if you've ever sat behind a really tall lawyer at a movie, though, you know, they're not invisible. Alright, I want to just get to mark Okay, tumor, I just want to cap this discussion here. This, this discussion obviously mirrors what we said one or two livestreams ago about the epidemic of learned helplessness that seems to have taken over the world. And we need to bootstrap our way out of this. So I don't know, I'm hoping the slogan has never been said by anybody before, but live at your own risk. That's my feeling is you should live at your own risk. And that

**Bret** 56:10

I want that's the title we should have had for this episode. Live at your own

**Bret** 56:14

risk. All right. Well, anyway, that's a piece of advice. You heard it here first. And second. Third, now that we said it repeatedly, yeah,

**Bret** 56:22

please just keep saying it. Yep. All right. Um, there's a paper out suggesting that obesity is a significant risk factor in in bad outcomes in both hospitalizations and bad outcomes. COVID-19. And I'm not going to spend a ton of time on it here. From the discussion, quote, it is notable that the chronic condition with the strongest association with critical illness was obesity, with substantially higher odds ratio than any cardiovascular or pulmonary disease, obesity is well recognized to be a pro inflammatory condition. So the paper isn't perfect. It's rough around the edges not going to go into into analysis like we did on the

**Bret** 57:04

was this a peer reviewed paper? Or is this a preprint? paper?

**Bret** 57:06

This is a pre printed paper, okay. Yeah, this is a pre printed paper. Just out, there was some journalistic reporting on it, including an article from wired. Now wired, as I understand it, as I remember, it used to be a reasonable publication wasn't fully captured by the ridiculous people just yet. But here's what they have to say. Quote, obesity appears to be one of the biggest risk factors related to COVID-19 hospitalizations and critical illness Newsweek claimed on Tuesday, yet this rhetoric is based on flawed and limited evidence which only exacerbates the stigma that larger bodied people already facing society and our healthcare system. That stigma is what truly jeopardizes their health not wait itself. A fact it's only more important to consider in the midst of this pandemic?

**Bret** 57:54

Wait, what?

**Bret** 57:57

You know, really, that just speaks for itself? This I mean, come on people.

**Bret** 58:01

Yeah, this is making Wired magazine a risk factor.

**Bret** 58:06

Yes, reading, we're reading Wired Magazine. This you also heard this year first reading Wired Magazine, turns out to be correlated with being a greater risk for coming down with COVID-19.

**Bret** 58:15

So can I can I wrap this back up into the the discussion of telomeres and the magnetic force of the grave and all of that. It is important that we now understand the way obesity is connected to many pathologies, including maybe in particular, this one. But in general, there's something obvious about this, right? To the extent that you are a machine that functions in the world, you are subject to damage. You are unlike most of the things that we call machines, because you can repair yourself, you can you know, your car can't replace a ball joint, but you effectively can replace most of your tissues, but the rate of replacement is matched to your lifetime expectations of need. And you can accelerate damage in any one of these tissues. Well, the thing is, obesity isn't anybody's fault, right? You're built for an environment where these resources are not highly available. And many of us are built for seasonal environments where it makes sense to stock resources when they're plentiful for lean times. But the fact is, every step that you make in the world has a cost based on what you're carrying the wear and tear on your joints. Maybe this is less obvious, but the wear and tear on your heart the you know the extra force necessary to perfuse a larger body is bound to have negative consequences for these tissues, which have a fixed amount of repair that they can go through over a lifetime I should say. Fixed is probably just slightly too clean. All right, it is it is set at birth for most tissues, there is probably some flexibility. But that flexibility comes with a risk, but never mind a topic for another day. So anyway, yes, obesity seems to be an important risk factor. The good news is that is at least in principle, something that might be under people's control, although obviously not on this timescale, right. But this isn't the last time you're going to face an infectious disease. So it's worth thinking about.

**Bret** 1:00:28

Yeah. Good. Okay, one more, one more point. And then we'll take a break, before we go into the q&a. And a few just logistics before we wrap up, but on the topics of politics, and polarization and the optics of protest, that we have mostly, probably all seen at this point, the protests that have been happening in in Michigan, in Nevada, in Virginia, I think, in Washington state and our former hometown, Olympia. And it is it is becoming a mark of being on the right that people are out there objecting to shutdowns. And I find this alarming on so many levels, among other things, all of us, no matter our politics, and no matter, our politics, will be having an increasingly difficult time with being in lockdown with not having access to our usual ways of being our usual in many cases, income streams, ways to get out, out and interact with people all of this. And if it becomes a mark, of being a conservative, or, or a magga, hat wearing supporter of Donald Trump, that you object, and you talk publicly about how difficult it is for you. And that not talking about it and being stoic is, what is your badge of being a liberal or a Democrat, we've got really big problems. This is I would say, really, really, really not the time to be playing politics. This could be unifying us, in fact, so our leaders should be allowing it to do so. That means for instance, within the US, Trump should not be playing to his base reports. And democrats shouldn't be going apoplectic if or when Trump does the right thing. We all want and need to win against this virus. If that happens, we play it will be played as a win by our leaders, whoever they are, and whatever they've done. It's better, that our leaders get credit that they don't deserve, if they don't deserve it for a good outcome and a crisis that they botched, then that those leaders go down in history is having overseen a massive meltdown of social and economic order in the wake of a devastating pandemic. So no enough already, we need to stop the polarization. What if we become a society in which those who are facemask and flu season are marked as liberals and those who don't are conservatives, we've we've already seen what the magga hat phenomenon in the last election sort of revealed us as a seussian landscape of star bellied sneetches and sneetches. Without it doesn't make any sense to live that way. The hatred and the immediate judgment of people who look a different way, it's awful and serves nobody but those who would rather that we don't have a functioning side society and not figure out collectively how to make a better world. So just to finish here, if Donald Trump, for instance, were to start being a statesman, and I don't see any evidence that that's happening, but if he were to start being a statesman, and fast track in the formulation and distribution of tests, both antigen antibody and to provide a plausible measured prediction for when social distancing measures could safely be ease based on those testing results. Well, if that were to happen, all of us, all of us, regardless of how we voted or how we intend to vote in the future, should say yes, man, well done. Good. Anya, keep it up. Thank you, congratulations, please keep that up. And at this rate, it doesn't look like that's going to happen, which means he will be less motivated to make it happen. And we are more doomed to a bad outcome.

**Bret** 1:04:17

Those are excellent points. And I agree with them, and they dovetail with something you and I have not talked about. But I've also been pondering the question of politics in this era, and the fact that it is, it is almost the precise description of the opposite of what we need. And one thing I would just point our audience to, there is a tendency if one says something critical of Trump or his response to this crisis, to regard that statement as inherently political. And the same thing is true on the left if if one says it is completely unacceptable, that the party that supposedly represents my interests, Going to hand me Joe Biden as the right solution to this moment in history, the right solution to challenge Donald Trump. I am not responding politically. My point is the fact that our two party system has delivered us, Donald Trump. And Joe Biden says it is a failure. And yes, you can tell me this is not the moment to address that we have to simply deal with the evil on the other side by voting for the evil that we're, you know, delivering you in the in the blue hue? No, if not, now, when we have to deal with a system that election after election delivers us nothing but unacceptable choices. And I'm sorry, if you're a Trump supporter, and that comes as a shock to you that you would think, you know, I would have to admire him. I don't I don't know why we elected him. On the other hand, I can't say that the alternative is vastly better. We're just basically choosing every election between failure modes, and I'm sick of it. So let us sideline those people who would deliver Deliver us such terrible options. And let's come together and figure out what the hell we're supposed to do with a system where the parties have a stranglehold on power, and the answers they give us are unacceptable.

**Bret** 1:06:20

Yes, good. And regard each other fundamentally as human beings, rather than as Democrats or Republicans, liberals or conservatives, you know, flyover country versus coastal elites. Yeah, it's it's, it's inherently divisive.

**Bret** 1:06:34

And just because you hear people speaking in a political way, most of the time, do not assume that when you hear somebody making a critique of a political entity, that they are being political, I don't feel like we are I feel like we are being patriotic, not just to our nation, but to our planet. I think it's never been more obvious that we have these levels of obligation. And yes, nation is important. But it's not the only one. And it's not the top one, our obligation to future humans is paramount. And if we're going to get out of this crisis, and we're going to get out of the thing that creates crisis after crisis, we're going to do so by thinking in a non political way. It doesn't mean we have to, we cannot do anything other than abide by the realities, we're handed. But our objective should not be political.

**Bret** 1:07:29

Very good. All right. All right. Just a couple logistics, we're going to do with Super Chat, what we did last time, we're going to take the first half hour of the next live stream to go through the, the, I guess the top monetary value, slash best questions that we see in a very quick look through, and then the second half hour to go through the lie of the Super Chat questions that come in during that live chat during that livestream. And that'll start in 15 or so minutes after we stop here. And then we're gonna change up our schedule. And it's been a little inconsistent of late but we are people seem to like when we ended up having to drop into the weekend last time. So I think we're going to for a little bit here, shoot for Tuesdays at this time, Tuesdays at 330. Pacific, and then Saturdays at 1230 at noon 30. Pacific, which will allow people in Europe to tune in live, which we're hearing some people want to do.

**Bret** 1:08:24

And I would just add, we are looking for a better model to deal with things like questions, Super Chat is not ideal. We're dealing with it for now and we're learning how to marshal it. But we are open to a better model and actively looking for one so if you're not thrilled with the Super Chat system, you are not alone. All right. We will see you in about 15 minutes.