Bret and Heather 55th DarkHorse Podcast Livestream\_ Nothing ...

Sat, 10/9 12:26PM • 1:43:26

**SUMMARY KEYWORDS**

science, paper, result, female, fact, point, grateful, male, hypothesis, question, dog, people, walking, mentor, bias, case, true, transmission, based, sex

**SPEAKERS**

Bret, Heather

**Bret** 00:08

Hey folks, welcome to the Dark Horse podcast live 55 stream Yes, I've reorganized the words in order to make live 55 work because it's is that alliterative.

**Heather** 00:18

alliterative, no, it rhymes.

**Bret** 00:21

Internal rhyme. Alright, forgive me. Well, anyway, here you are. And here we are,

**Bret** 00:26

if that's the only thing they need to forgive you for, I'd say we're ahead.

**Bret** 00:30

All right, I would like to assert that that is the only thing that they have to forgive me for. And we'll just go from there. Excellent. All right, perfect.

**Heather** 00:37

So today, we are going to talk a little bit about a study that came out about COVID-19 that gotten to the press and alarming number of people, including us. No, I

**Bret** 00:49

wouldn't say that. No, I was alarmed, I was alarmed that something was amiss based on the claim. So our

**Heather** 00:54

friend Dave, who, who made that beautiful made both the logo here and the knife in the background. alerted me, I'd not heard of it and said, I suspect something's wrong here. Anyway, we're gonna talk about that. And we're going to talk about the queering of mirror of Muir Woods and the National Park Service and the simultaneous in time LGBTQ stem day, hashtag LGBTQ stem day and what that means about our future, I want to end with giving a little bit of gratitude. And I think there's a few other things we want to talk about here in there in between, does that sound like what we had planned?

**Bret** 01:33

That sounds exactly like what we had planned. All right.

**Heather** 01:37

Maybe, actually, maybe we should start by saying that our Patreon, our private q&a, or private tune to our q&a will be not tomorrow, not this Sunday. But next Sunday, and right after this livestream, I will be opening up the 48 hour window for the questions that people at a certain level at my patreon can ask and we prioritize the questions. We don't get through all of them. But we spend a lot longer on the questions that get asked in the private q&a than we have time for. And these public ones. So consider joining us there and

**Bret** 02:10

the queues have been excellent thus far. Yeah, they

**Heather** 02:13

really they really are in quite diverse. tend towards. A lot of them are are sciency, which is which is wonderful. Exactly. All right. Shall we start by talking about this, this study? Let's do it. Alright. Let's see. Maybe we start first by showing just this this headline, Zack. So this is in the Daily Mail, dog owners face Sonia 78%, higher risk of catching COVID Wow, this is an add risk riff on dog owners face 78% higher risk of catching COVID-19 and home grocery deliveries, double the risk study finds. That's the headline. Okay, there are a number of headlines that that looked a bit like this also among headlines, screamed from the headlines masks don't do any good. But, but cleaning your groceries when you get home does that sort of thing. So this sounds both alarming, and also really inconsistent with a lot of what we have come to understand. Yeah, just a reminder for those who have come to our live streams our podcasts since the end of May, when we started we started on March 24, I think was our first one specifically to talk about COVID. And our first 16 or so episodes were almost entirely about COVID. And we really walked through some of the some of the evidence that was coming out for what was true about it and some of the politicizing of it and all of this and you know, this result, If true, the set of results of true really goes counter to sell much of what we think we understand.

**Bret** 03:55

Yeah. And so for those who've been around from the beginning of our live streams, you watched our model develop and indeed at the very beginning, we were quite concerned about what are called fomites which are viral particles that are transmitted on surfaces, which is a very common way for viruses to be transmitted. But it became clear over time that that was less prevalent in in the case of COVID and so this study a presumably people walking their dog or doing it outside should be fairly safe and using their dog chasing their dog around their kitchen. Yeah, all right. I mean but so anyway, there's something weird about you know, alarm over walking the dog. There's something weird about the idea that having stuff delivered to your house is dangerous, have groceries,

**Heather** 04:44

so she's being delivered to your house appears to have contained within at a greater risk of contracting COVID than going out grocery shopping for yourself. Right? Right. That's one of the results as well.

**Bret** 04:54

Seems to make little sense because having them delivered to your home eliminates whatever confined spaces, you might might face, in the grocery store or in vehicles or whatever. So anyway, there's a lot here that raises alarm bells, either the, either the study is in some way flawed, or the model that we have been building up is deeply flawed. And so anyway, yes, it? It does raise exactly that question.

**Heather** 05:21

Yeah. I'm sorry, my computer is not behaving. Yeah, thank you. There we go. Thank you. Um, let us if you would show this for just a moment. So this is the actual paper. It has a publication date for those who read publication dates of 2021. Just meaning that here is the is the early publication online, but it is it has been peer reviewed, it is due to actually be published in this form, early and 2021. With the headline the spread of SARS Coby to in Spain, hygiene habits, socio demographic profile mobility patterns, and co morbidities. Okay, let me walk us through just a little bit about what they tried to do before we talk about some of the results. And I guess, spoiler alert, it does not seem that we should be overly concerned about the results screaming from the headlines as a result of this research, because I at least have very little faith that these results are going to end up being meaningful, having now spent some time with the paper itself. So for a few reasons, the methods were a survey, an online survey of people's activities, that is self reports. Self reports are often somewhat unreliable, people remember different things that are that are actually true, but fair enough. It's a fairly common social science mode. However, basically encouraging people who ever feels I get to go online is to and fill out a survey is not the most rigorous way of getting self reports from people of having people take a survey. And the survey was taken or was, was asking about the period of most intense lockdown in Spain. So everyone remembers this early, early bid spring, when Spain and parts of Italy were in such high lockdown that people weren't really discouraged from leaving their homes, right. So this is all of the results, if they are trustworthy, based on these self reports are about a period during which all of the most intense methods of transmission as far as we understand the virus had already been eradicated. Right? So there was there was no there was very little working in offices, although there was some there was discouraging of social events, there was no I think, basically complete shutdown, just as in most of the US have most of the retail sector except for essential businesses. And so that that alone need forces us to recalibrate our estimate of what something like a 78% increase in risk of contracting a virus, when walking your dog say, would mean because that 78% increases compared to a rate that has already been drastically reduced by the fact of the lockdowns that the government has imposed. That's true. That's just something to be aware of when thinking about how to calibrate internally what these numbers might mean. But here's the point in the paper where I really started to question whether or not we should be believing anything in this in this physical analysis. So quote, considering that the capacity of diagnostic tests in Spain was not sufficient to affirmative categories were introduced. One of them was affirmative by diagnosis and the other by patient self report. What that means in English, as opposed to science ease is in order to assess so that you know, they asked people did you walk your dog? Did you take the metro Did you know to do work from home all of these things? And then separately, they also asked everyone, did you or do you not have COVID? And those people who ended up at the Yes, I had COVID column ended up there by one of two ways. Either they had an actual diagnosis from a test, or they said, Yes, I suspect I had COVID. Yes, I suspect I had COVID is indistinguishable within the results of this study from Yes, I had a test and, and it came back positive for COVID. And not only that, not only are those two categories, which are wickedly different, combined and impossible to untangle in these results, but fully half, fully half of the affirmative cases are coded to self reports. Alright,

**Bret** 09:37

so number of things, one, wonderful teachable moments in here. Yeah, so many. One thing to say is that weren't the case that self reports and self diagnoses were random in their nature, then all that you would need to do to correct for the problems of them being important to the methodology The study is have a larger data set the problem and increasing this is something I think a huge fraction, even of the educated sophisticated part of the population is not grokking is that everything changes when you have a systematic error rather than a random error. A random error sounds worse in some ways, because you can't fix it, right? I never get rid of them. It sounds like it's very destructive of data. But really, the point is, it just it's like a noisy restaurant where somebody is talking to you. It's it's random stuff. And you can find the signal through it,

**Heather** 10:34

and increase yourself, as he just said, increase your sample size in order to decrease the effect of random error. That's how you do

**Bret** 10:40

it, right? The problem is systematic error, especially systematic error that you're in no position to estimate creates a whole different problem. And it does not go away with a bigger sample size. In fact, it can get worse, you can reinforce the sense that something is there that isn't. And so the question is, how likely is it in a world where people are self diagnosing that their tendency to self diagnose incorrectly is correlated to some other thing in their personality? Right, their tendency to report that they've walked their dog when they haven't, right? Maybe, you know, who knows what it will be correlated to, but the chances that it is a random factor are low. And we are in a very poor position to say what else it will be correlated with. And therefore one has to worry that there might be false signal in here rather than just a bunch of noise. Yeah,

**Heather** 11:27

and the numbers aren't, aren't that big. So even if some of the error is random, we, we should expect that it will actually be conveyed here as well. Yep. Okay, so with regard to the results, like all of those, those are, hold on. So we've got, it's a survey, not actual known data, and what people were really doing, we've got self reports where people we know will lie about things that make them look to the outside or feel better inside about themselves. It is about a moment in time when the most extreme lockdown was happening. And therefore, when people were in fact, the most worried, and the most confused, and the most alarmed, and probably the most likely to mistakenly self diagnose, right. And the statistical analysis itself, the way that positive, that positive COVID diagnosis is assessed is is deeply suspect. All of that said, we can talk about the results knowing that maybe the results don't mean anything like what they what they say they made tonight, and I intend to but you want to say something.

**Bret** 12:33

Yeah, I wanted to say something which is just as a scientifically sophisticated but not expert in this particular area. person. I would say one thing that is a red flag for me is that it's hard to imagine a mechanism whereby walking one's dog increases transmission. assuming that's got a couple, I've got a couple bosses. So I've thought this through too, I've come up with some stuff that might work. And in fact, would match some errors I've seen elsewhere. So we'll come back, let's see if we've got the same search engine.

**Heather** 13:06

Let's just let's just kind of spell this out before we go into the details in a little while, which is that okay, if if you have a result that you trust, the next thing you do is in this case would be will will Why then what you know, what is the mechanism? That's surprising? Again, we don't think this is a legitimate result. I don't anyway, but if it's true, then the next question should be, why does walking the dog cause an increase in in COVID risk, and then from there, you would want to posit all the possible hypotheses and then test them. So it's an addition it's not it's not going back and replicating the original data that you tried to take. But it's now testing a new observation that is the result of a previous scientific test. To figure out to get more granularity on the Y on the mechanism of why the result is what you think it is, again, that all hinges on the idea that the initial result is true, which I don't see any reason to think that it necessarily is

**Bret** 14:00

right. And I'm not saying that there's any way that you can look at a result like that and say it's too surprising to be true. Or we can come up with various, you know, shocking ways that it could be true and sometimes shocking. Things do turn out to be true, but my point would just be okay, I've walked dogs, okay, I have some sense of what that typically looks like. And I don't have any reason to think that my experience walking a dog is particularly unusual. A people tend to do it during the day, I'm not saying 100% but maybe it's 80%, right, so UV light, they tend to do it outside, right? They tend when they interact with other people, one is often at a distance because you've got dogs and a leaf circling each other, whatever. So it's not like you're right up in each other's faces. When you talk to somebody that you meet. While walking the dog. All of these things should tend to keep rates of transmission very low, rather than make them high in and you know, particularly conspicuous is just the fact that outdoors seems to at least so far during the pandemic have been terrific. Quickly protective even at night, even when there's no UV. So you would need some other kind of mechanism. Now I'm curious, what did what did you come up with, in terms of possibilities if this result was right, a couple

**Heather** 15:11

of things, one, excuse me is actually goes a little bit counter to what you just one of the things you just said, which is that, especially during a time of social lockdown early on, when people still hope that it was maybe you know, a month or two, but we're really going out of their minds, as as people are again, of course, with suddenly being socially isolated, walking your dog and seeing a neighbor or seeing someone you know, even whom you don't know, but whom your dog, you know, if someone else is walking their dog and your dog wants to meet them, this is a perfect excuse even for the for the most COVID concerned, you know, even for the most hawkish among us, with regard to COVID, to let the dogs sniff each other, and perhaps get a little bit closer than you should and to have a little conversation. And if In addition, neither of the people walking their dogs are wearing their masks, because it's outside, why would you and you do not you know, in a moment, when you're actually talking with that person put on a mask, then there may well be a possibility of transmission there that said there was a result from you know, many I think 10s of 1000s of people out of China early on that I talked about in one of our first episodes that showed that across 10s of 1000s of cases where they could track transmission, literally one of them was trackable to an outside interaction now wasn't an interaction between neighbors talking. Right, right. So so there's there's that possibility, which is, which I think is not very likely. But I you know, I have, I did at one point, not walking the dog, but have a drink outside with a friend, actually Nancy Ron woman, at some point, you know, in the late summer, and we were sitting across from each other at a table outside and the sun was coming in sufficiently that I could see as if either of us talked and like spiddal would come out of our mouth, like, oh, maybe we should be sitting on the same side of the table physically closer, but whatever is coming out of us is going to go not into each other's drinks or whatever, or noses but actually away from one another. So I do think that, you know, close, close facing each other outside and talking is going to be a better route for transmission than sort of being side by side. That's one thing. And then there's of course, the possibility is that there's dog to dog transmission and dog to person transmission. And there is not evidence over this yet. But there is some suggestive evidence that it might be possible now and hold on it specifically not just people walking their dogs and meeting other people walking their dogs. But this research did not ask about whether or not if you walk your dog, you also took your dog to a dog park. Right and so dog park is going to be an I can't think dog park now without thinking about that rabid dog barks paper the grievant studies people put together but you're a going to be in a much more social situation both with people and with dogs. And if there is transmission between dogs and dogs to people, then that would be a pretty good place for it to happen.

**Bret** 18:08

So okay, so this this gets tangled here, because the fact we're transmission from dogs to people, not just possible, let's grant that even if it is never happened, it might still be possible. Sure. But were it a route that was likely, then we would certainly have had lots of opportunity to discover it. Because there has been lots of interest in dogs and cats and their contracting COVID. And in epidemiological circles, what transmits to what is a very important factor. So the point is, it's an obvious question. Now, that doesn't mean people have looked at it. But I will be shocked if nobody has looked into the question of dog to person transmission. And so if this paper is detecting dog to people transmission?

**Heather** 18:56

Well, again, this paper is completely agnostic on that right now.

**Bret** 19:00

That's my point, if it's detecting it without specifying it as a mechanism. That's a remarkable thing. And again, the thing that is most glaring here is how robust the This doesn't seem to transmit outdoors result is and the fact that it would have to transmit outdoors here, either between people walking their dogs or dogs to people, something has to be happening and that is so contrary to the model that has developed and robustly so because of course, the question of protests and whether they were going to create a massive wave and that they don't seem to have which you and I said I will be careful about saying we predicted it, but we did say there's a strong possibility they won't because these things tend to be outdoors and for whatever reason, probably multiple reasons. Outdoors does not appear to be consistent with spreader events. Yeah.

**Heather** 19:54

So did you have what did you generate? was it was it like what I did or what did you generate with regard to possible mechanisms if this result is true, yeah. And walking your dog actually is associated with an increased risk of contracting COVID as opposed to not having a dog or not walking your dog at all, which is, which was Those were the lumped categories. What other mechanisms that we haven't yet talked about to do generate? I was

**Bret** 20:17

wondering, so in a prior case, which I was unable to find, but there was a, an alarming report of a paper that suggested spreader events at protests or at maybe it was beach parties or something like that. And I was I thought, Oh, my God has this thing evolved. I'd be transmissible outdoors, which is one of the things you and I have worried about that it doesn't transmit outdoors, but it could learn that trick if we're not careful. And in any case, I went to the paper, and it was like, there was no evidence that was being transmitted outdoors, there was some other phenomenon that was lumped in here that involved indoor contact between people, right. So in this case, I was wondering if under lockdown conditions, walking one's dog resulted in something like, you know, going into a coffee shop right now, maybe coffee shops weren't open at that time. But I was imagining that there might be something that people who were outside because they were walking their dog were doing that wasn't outside, that could be some route.

**Heather** 21:19

Well, I think, if I can pull it up here, Oh, actually, I have it on paper, I think it's unlikely to be true just because where what kinds of retail outlets people went into is in here. And they don't ask coffee shop, but they ask, have you been to a supermarket green grocery poetry, bakery, pharmacy, tobacco shop, bank, medical care center? And for none of those? Was was there a significant increase in likelihood of contracting? According to this data set? which is which I don't trust?

**Bret** 21:56

Right, right. So all I'm saying I don't think that's likely at all. But if the result was robust, which you and I both suspect it isn't. But if it was robust, that's one of the places I would look is, is there some behavior that is captured by you know, within walking the dog that isn't recorded in the data that is actually responsible for the transmission in some ways, or like,

**Heather** 22:17

some sorry, in some ways, that's the same as the same category as my, well, if you're the kind of person who walks your dog, you may be also the kind of person who goes to dog parks. Right? So it's like, you know what, what else is in this category that you'd man you didn't manage to collect with the survey. And, you know, I'd like to see the dog walking versus dog walking and dog park going. And you might like to see the dog walking only versus dog walking and, you know, going into other businesses while in the dog walks like that. I guess one other, there are a few more results I want to talk about here. But I will also say Where is it? In the conclusions of the paper, at the very end of the paper, I quote, the results of this study demonstrate that living with dogs working on site, purchasing essential commodities by using home delivery service, and especially living with a COVID-19 patient have been the main routes of transmission of SARS COVID, to during the most restrictive period of confinement in Spain. Now, I hope that's just like a typo. But that is exactly the opposite of the result that they actually found in this paper. And I went back and looked at their results. And now we don't have access to the the actual the raw data, but the results show that pet ownership is not correlated with, you know, again, if we can trust these data, but you know, every single thing we say about this paper is if we can trust the day, and we don't think we can, but using the data that they are talking about here, they find that pet ownership is not correlated with increased risk of covid 19. Whereas walking your dog is and then the conclusions they say the opposite. They say something which they absolutely 100% found not to be true, which you know, that's that's a kind of sloppiness that is really not okay.

**Bret** 24:03

Well, I agree that the implication of that sentence was exactly what you say. And it is counter to even the patterns in the data they seem to think they have found there's a way in which you could defend the sentence. In other words,

**Heather** 24:17

no, no you because because they specifically talk about pet living with pets early in the paper, right? But like this, it's not even like we didn't look at that. And so we're kind of being sloppy in our talking. This is this is a thing that they specifically looked at and they found no evidence of it and they say they found evidence of it. No,

**Bret** 24:31

no, I get it. It's completely misleading. But the fact is dog ownership leads to dog walking. And so if dog walking is where the transmission is happening, then dog ownership is the gateway

**Heather** 24:41

now totally not giving them a pass here because they said they are giving them a path. No, they have people who say I have dogs, but I didn't walk them during the pandemic because I was concerned, right, people who have dogs who didn't walk them show no increased risk according to this data set, which I don't trust, but so No, no like this is actually one of the few places where they do have granularity in terms of their categories. And then they lose that granularity and say something that they did not find even in their conclusions.

**Bret** 25:08

Well, so here's the problem is I mean, I'm defending a losing position, because I think no reasonable person could interpret what they said that way. But if we go back and say, what kind of error was this, I believe there's a logical basis on which that sentence? And maybe, you know, I don't know if there's a language issue here or not. But that's that's also quite it's possible that they arrived at something that, you know, has a connotation that's absolutely not justified, but that if you just look at the words, that one, it is not a false statement.

**Heather** 25:39

My hope is it's a translation issue. But given that they have they were careful in the rest of the paper on this exact issue, I don't, I can't even begin to explain that. So two other results, again, from an analysis of a data set, the analysis of which I don't know, the data set I don't trust and the analysis I don't trust. But one result is that public transport on taking public transport did have a big effect on on Transmission risk, in all the categories they looked at, including buses, trains and metros, but not taxis, interestingly, so that that, again, is consistent with the model that we have that has been emerging that we've been talking about from the beginning, which is that small enclosed spaces with lots of people with relatively slow clearing of the air and lots of people breathing into it, there's going to be your high risk environment, whereas a taxi, with one person with one person in it at a time plus you is going to be lower risk.

**Bret** 26:46

Well, actually, I'm suspicious about this. Now it's possible, you could have something like there was wisdom circulating about air circulation, and people were building their windows, or that, you know, amongst taxi drivers, there was, you know, informal discussion of open the windows after somebody has been in your vehicle before the next person gets in or whatever, there could be something that would be protected. But my sense is, even given the contract with a much smaller number of people that happens in a cab that a cab would be a very dangerous, a place where there's a high risk of transmission and be a place where interventions could be massively effective, right? clearing the air by opening windows or driving around with your windows open as we have done that is labeled to be highly effective. And so I want to know what that why the taxi show up as anomalous there. Yeah.

**Heather** 27:43

And one more thing, that the result that cleaning your groceries when you got home was effective at reducing the risk of getting the virus but wearing masks was not struck me as maybe the most surprising of all? Well, that is, of course, not what they found, again, data or suspect analysis is suspect. But if the data are legit, and the analysis is conveying, conveying accurately what is true, what they actually found is not that mask wearing doesn't protect against COVID-19. But the mask wearing outside doesn't protect against COVID-19. They specifically ask people when you go outside, do you wear masks? And those people who did did not suffer did not experience a greater relief from getting COVID-19 those people who did not guess why? Because it's really hard to get this thing while outside now that does run counter to this dog walking conclusion. But it's not that masks don't protect against COVID-19. That's not what they asked, right? That is not what the study asked at all. So

**Bret** 28:48

it's like if we were to try to figure out the exact analogy, it would be like deciding that knowing how to swim is not protective against drowning by serving people who were on land. Right? Yeah, yeah. Yeah, swimmer no more likely to drown strangers. That sounds amazing,

**Heather** 29:06

right? We just all know how to swim.

**Bret** 29:08

For some

**Heather** 29:10

some Yeah, that's good. Right? So and that that last thing, that's not the author's fault, right? The fact that the media take this and run with it, and make scare headlines to sell your products that you don't need is not the fault of the authors of this study. I do think there's plenty to critique as we've already done about it in the study. But the sort of screaming from the headlines masks are less effective than cleaning your groceries when you get home against COVID-19. No, I'm not not in any way compelled. And not only that, that's not even what the study says.

**Bret** 29:42

Yep. All right. Are you there? Because I have a question for you. Are you there with respect to the study or you have further Do you want to go?

**Heather** 29:51

Yeah, I guess maybe just one more thing is that we? We talked we've talked a lot about how this virus might be evolving. And it I, I've seen just a few, you know, I mostly don't go and look at, you know, comments and stuff, responding to what it is that we've said. But I began to see a few things that suggest that people are misunderstanding that claim to mean that our understanding of the virus is evolving. That is also true. For sure. I think everyone on the planet understand that that is true at this point. And that early claims that were wrong were sometimes wrong, because they were political, and the people making them knew they were wrong, like the Surgeon General saying don't wear masks are not helpful, that sort of thing, when they had every reason to think that they were. But certainly some of what we have thought to be true, we now don't think to be true. And that's not because there's deceit going on. But simply because we have a better model now of what's true. So our understanding is evolving is one true thing. But it is also true, that the virus itself has every reason to be evolving, evolving, as it comes to infect more and more, most people, maybe other species as well across all range of habitats in different seasons with different amounts of indoor versus outdoor social versus non social engagement. And so we should, we should be thinking about even what we really understand to be true about this virus back in March. And also be asking whether or not those things still hold now, two thirds of a year later.

**Bret** 31:24

Yeah, that's a really important point. One caution, is what we know should go up over time. But that there is an analogue to the hazard that we described. And I think our last live stream, where as something becomes rare, it becomes people become increasingly sentence sensitive, and start seeing it where it isn't to the analysts years ago, I think, yeah, the analog here is that as the virus becomes rare, then our data is increasingly polluted by erroneous reports. In other words, if the virus were zero, then studying false reports that would give us a wrong sense of what it was doing, and what kind of effects it was having on the body. So that's just something we need to be cautious about.

**Heather** 32:13

That's absolutely true. And we actually talked about the sort of the early side of that problem early on when rates were going up. rates were still you know, the number of cases are still very low. And we talked about why false positives are going to make the rate seem like it's much higher than it is when you have very low back very reliable isolation. Yeah,

**Bret** 32:32

exactly. All right. So are you ready for the bonus round? Yeah. Okay, good. Here's the question. This paper seems to suck really badly. Do you want it retracted?

**Heather** 32:45

Ha. Now?

**Bret** 32:48

Excellent. You have done very well, in the last round, however, many points were available. You've earned the earned a new car. Yeah. Well, how about just when we've already got it?

**Heather** 32:57

I'm happy with it. Okay. I don't need a new

**Bret** 32:59

car. Yeah, no, I I'm glad to hear you say that. I

**Heather** 33:02

had little doubt that I don't want a new car. That

**Bret** 33:05

also financial reasons. But

**Heather** 33:08

know that I know, I do not want this paper retracted. Now, where are you you want to happen? What do I want to happen? I want conversations like this to, to happen in the scientific community, and not just here, but also have journalists hear it and to boy, I want better scientific literacy. So that some, at least some of the ways that we have dismantled this paper here, become second nature to anyone who is looking at a paper, but the vast majority people never see the papers. They see the the journalism on it. So science journalists need to up their game, this, this needs to be listening to be far, far better. So I do wonder what, what all the peer reviewed looked like in this case? You know, how? How, the presumably three anonymous peer reviewers, which is the usual, the usual model, responded to, to the idea that they had lumped diagnosed cases of COVID with people who said I probably I suspect I have it, like what was the peer review response? And what did what did they not catch it? In which case that's that's yet another failure of peer review. So I want all of those things and it's a big broad set of things. But retraction. Now,

**Bret** 34:32

would you want other papers published the challenge the methodology here looked at the data and figured out whether there was anything to be seen? Something like that?

**Heather** 34:41

Yes. And actually, and a letter to the editor of this journal saying, here's, here's five problems with this paper, please, please. Do what you can to have this sort of come up whenever people search on this paper, right so that people can see the concerns. Yep.

**Bret** 34:55

Wonderful. All right. Well, I'm in complete agreement. The right thing to do here is The natural scientific thing to do, which is to take a paper that appears to be honestly generated likely to be mistaken and its conclusions and to challenge it inside the modality of science in a in a way that is trackable, right? a retraction is a very problematic thing, because we will have had this discussion about whether or not walking your dog gets you sick, and then suddenly, the paper vanishes from the record as if it was never there. It's it's become unpaper.

**Heather** 35:31

Yes, yeah. Yes. All right. So you are not by chance talking about this paper here. It is on

**Bret** 35:39

my mind.

**Heather** 35:41

To show up briefly.

**Bret** 35:42

Yeah, actually, can you scroll up? I will read the abstract and the title here. Okay. actually see, I can see it. The paper in question which caused the big Firestorm on Twitter and elsewhere. It

**Heather** 35:55

was published in Nature, one of the two biggest science journals in the world this week. It's in

**Bret** 35:59

nature communication. That's

**Heather** 36:00

right nature communication.

**Bret** 36:02

So published by nature, but in a less high profile place. The title is the association between early career in formal mentorship in academic collaborations and junior author performance. And this paper. Here I'm going to read the abstract and says, We study mentorship in scientific collaborations where a junior scientist is supported by potentially multiple senior collaborators without them necessarily having formal supervisory roles, we identify 3 million mentor protege pairs and serve a random sample, verifying that their relationship involves some form of mentorship, we find that mentorship quality predicts the scientific impact of the papers written by protegees post mentorship without their mentors. We also find that increasing the proportion of female mentors is associated not only with the reduction in post mentorship, impact of female protegees, but also a reduction in the gain of female mentors. While current diversity policies encourage same gender mentorship to retain women in academia, our findings raise the possibility that opposite gender mentorship may actually increase the impact of women who pursue a scientific career. These findings add a new perspective to the policy debate on how to best elevate the status of women in science.

**Heather** 37:24

Well, I for 1am outraged Are you outraged? I am Can't you tell? Well,

**Bret** 37:28

you are in good company. It seems that the the internet writ large has its knickers in a twist over this. Yes, yes. So here's the problem. First of

**Heather** 37:39

all, I have only skimmed this paper. I have not read it. But, but I saw some of the kerfuffle that you saw the kerfuffle. Yes, the twisted knickers, kerfuffle

**Bret** 37:50

twisted knickers so far no fisticuffs, but I think it's common.

**Heather** 37:53

No, that's, that's once you get male mentors on the scene. I think that's how fisticuffs come in.

**Bret** 37:57

Wow, I am not touching that. Okay, so number of interesting things going on here. The paper is complex, and deals with a complex and very large data set. There is every possibility that there are errors in this paper likelihood, it's hard to write a paper this complex on a topic like this without at least some level of error, which does not suggest that this paper is wrong in its conclusion. Now, I would point out, though, that the first of all, we are in a position as we have argued here before, and I'm not sure how well people get our point. But the philosophy of science is essential to do right, even if you don't give a damn about it, right. And most of us don't really give a damn about the philosophy of science for its own sake. But the fact is that a result that is preceded by a predictive hypothesis is vastly more significant than the same result found as a simple matter of observation. Now, in the case of this paper, I would argue that these people were accidentally testing a hypothesis that presumably they were just unaware of right now, I wouldn't say that their paper is completely without a hypothesis. If you read it, it appears that they are testing the hypothesis, that female mentorship of female protegees is enhancing of their academic standing later in their career. So there's a very narrow hypothesis on the table. But those who have followed you and me for a long time, we'll have heard one or both of us say that gender is the software of sex. That That means that the software is the fact of there being software of sex means that things that are contained in the software layer are more easily changed, but that it is highly likely that there are kinds of wisdom that have traveled a male route that is to say, Father to Son, Uncle to nephew, they're liable to be other kinds of wisdom that have traveled a female route mother to daughter, Aunt to nice. And that to the extent that we want a renegotiation of gender roles, which you and I have both strongly advocated for, that there might be the need for mentorship that takes wisdom that has traveled one of these routes or the other and broadcasts that across that line. Right? This this paper, which I'm not saying the paper is right. But the paper appears to test that hypothesis that there are things that a female protege might learn from a male mentor, that would increase her power in science going forward. Alright, so I find this very interesting in that light,

**Heather** 40:46

I think I actually generate another hypothesis for why this might be true. If it is true. Again, we've got a video. Yes, we've got we've got a result on the table. I haven't spent enough time with this paper to say whether or not I, I trust, its its methods, etc. Like I like I already went through with the COVID paper. But if you accept this result, why might it be true? let's generate some hypotheses to explain it, you've proposed one, and which is that basically, crossing between traditional division of labor, sex and gender roles, such that you can get some of the wisdom that has traditionally traveled on on one or the other line into the other line might be useful in terms of becoming your best, most powerful and productive analytical, creative self? That's one hypothesis as I understand it.

**Bret** 41:37

Not exactly. Okay, my point is, so an observation can generate a hypothesis that then requires a test. I know I'm not telling you anything you don't know. My point is the hypothesis that we put on the table. And I believe it's actually in our, in our Rogan appearance, that there are kinds of wisdom that travel male line kinds of wisdom of travel female liner, to the extent we want to renegotiate, there needs to be some transmission of what it is that's known in each of these realms that the other side needs to be aware of now. So that's my argument is that's a pre existing hypothesis. Yes, that predicts this result. Oh, okay. So it sounds like explain it. If it's true, it predicts that it's true. And that gives that means there is reason to think that hypothesis is accurate based on this result, if the result is robust.

**Heather** 42:27

Yes. So I guys, I see what you're saying. So, boy, I mean, you can you can do it both ways. It's more powerful to say to have it be true that we said this earlier, and didn't think to propose this experimental model, this experimental test of that hypothesis, but it does seem to be a test of the hypothesis. Yep. So mine, then is a subsidiary explanation for this results that women in science may do better. This result, if it is true, is that women in science may do better with male mentors, which is that and this aim, it's related to what you were just talking about. It's not exactly the same, which is that in other primate species, and indeed, in pre industrial human societies, male and female, social interactions, were of course mixed, but they were very distinct. And in all other primate species, this is 100%, true male hierarchies, male dominance hierarchies and, and female dominance hierarchies. There's all this stuff in the in the common common discourse about alpha males and beta males and all of this and very little discussion about actually there's there's a parallel but very much not the same dominance hierarchy among females in baboons in squirrel monkeys in you know, in all of these species, and in other species, you also have rules around what are called phyla, Patreon dispersal again, I'm not telling you anything you don't know, follow Patreon dispersal where you know sex based rules where which sex at the point that it becomes a reproductive age disperses, and goes find another group in which sex stays in its Natal clan. And whichever sex stays whichever sex is so called file, Patrick tends to have the more kin based rule rich model of dominance hierarchy, be it female or male, then the one who on the sex who's going to be dispersing in that case. So anyway, all of this is true. We know that is true. And what we're trying to do in the late 20th and early 21st century, is reconfigure some traditional rules around separate female and male lines of of hierarchy in the workplace, for instance, and it's not easy, it's not simple. And frankly, one of the things that makes it not easy and not simple is that men find it pretty easy and without thinking about it, you know, just natural, which is a word that isn't great to use here, but to compete with one another, and so do women. And competition, putting men looks like the way we all think of competition between men typically looking in competition between women doesn't look like fisticuffs, it looks more covert, it looks more about changing social reputation, etc. But it may well be and, you know, anecdotally, I think I have I have seen this not just for myself, but across many of my peers, that it is easier effectively to walk into a situation across sex, and not be seen as a competitor right away and thus get a more collaborative dynamic going more easily. So it's effectively a way to Cluj to get around the older dominance hierarchies that are within sex, you know, and will dominance hierarchies emerge that are, that are together with both sexes, of course they will, but they're newer, and we have a better chance of more easily changing the roles.

**Bret** 45:56

Alright, so I agree with that, although a I want to know whether it's symmetrical, right? Male walking into a, a system of females may be disruptive of the collaborative instinct, who knows,

**Heather** 46:10

well, I but I don't say a system of male like a woman walking into a system of males. And this isn't. So this study, which I didn't read all up, but I read a little bit of it, you know, they're not looking at like PhD advisors, undergraduate students, they specifically aren't they're looking at publication records where there's a senior author and a junior author, and looking at the, the sex between them. And so that's not you know, sometimes these papers have 810 40 people on them, but I have no idea how carefully they looked. But in general, they were looking at dyadic relationships, they thought they were looking at dyadic relationships, which is to say, one, you know, one older person or one one senior person, one junior person, and their rubric for that, which is something like, you know, did you get your PhD more than seven years ago, or less than seven years ago? So yes, yeah, it's a little bit its course, its course. But it's not a you know, it's not a man walking into a system group,

**Bret** 47:03

or wanting I was responding to what you were saying about a dynamic, I wasn't talking about the paper in that case, right. So you know, about the ability to generate collaboration was what I was responding to. The So I do want to say that there's a possibility of something more, you know, the reason that the philosophy of science Park matters is that if the hypothesis pre exists the test, right, then you know that it is not confirmation bias, right?

**Heather** 47:34

So you know that what isn't confirmation if,

**Bret** 47:37

if the hypothesis comes if the hypothesis follows from the test, in other words, what you really have is an empirical observation, and then a hypothesis. And then these things are very frequently reported as if the hypothesis preceded the test. And the point is, you haven't really tested it, you have not tested so you don't have the power that comes from the scientific method. In this case, though, if the test is accurate, and it reflects the hypothesis that existed beforehand, even better, that they didn't know, they didn't. They couldn't have been responding to it are unlikely to be, then the question is, what does that say about it reflects Well, on the model that generated the hypothesis and the prediction. Yep. So what does that model say? One of the things that model says is that there is a male mode that is actually, I don't want to say integral, but is strongly consistent with scientific progress. And that male model, I'm going to argue has to do with what we have described as taking the piss out of each other, that there is a way that men who view each other as collaborators will still, you know, seek each other's weaknesses, poke at them, prod them, you know, there is a sort of competitive mode that results in you becoming anti fragile, because your intimate partners are finding what's wrong with your work. Yeah, so that you can take care of it before you unveil it to the world, that kind of thing. Yeah. And that women have a system. I'm not saying that any of this has to be, but women have a system in which with those they are collaborating with, there tends to be a reflexive support a building up, right and a build building people up. And so the point is that this might have an implication Now, here's the thing you had male mentors, mostly male mentors in graduate school? Yes. Okay. So cloggy tech, Alexander. I had mostly male mentors also, but Elizabeth calco stands out to me the marvelous she is now dead, unfortunately. But anyway, the most extraordinary batwoman of all, who herself had been mentored by Charles handily. So anyway, here's the thing if this paper is accurate, and it correctly reveals that the hypothesis This this that was on the table, which is that there are male and female kinds of wisdom that have been transmitted and that they have to be transmitted across in order to bring everyone in on the the endeavor. Then this predicts some further things, right? Oh, I should point out the second result here is kind of interesting, too, which was that mentoring females appeared to have a cost to the mentors going forward also. So that actually, yes, that so that actually is suggestive of a mechanism here, which is to say that the dynamic between mentor and mentee might be less effective. In other words, if you imagine just as

**Heather** 50:38

placeholders Are you sure about that result? Did you you didn't get that from the abstract? Did you know I think I did. So you have a reduction in the gain of female mentors, right? I think mentees? Yeah, it's not that that to me, does not read as a cost to me. Well, we will have

**Bret** 50:52

to go back and find I think that's what it does mean. But But anyway, we're sorry to distract. I know, that's okay. In any case, one way or the other, what this predicts going forward, if the model is accurate, and this is a proper test of it, which is robust, then it predicts actually, that the effect will decay over time. That is to say that females who have been mentored by males and gotten the benefit benefit of it will be better mentors to females that they mentor in

**Heather** 51:24

the future. Right. So second order male mentorship.

**Bret** 51:27

Yeah, I mean, I hate to put it that way, because I don't think it's like the men deserve credit for it. But what I do think, is that the answer love you and I

**Heather** 51:35

will and and, you know, if, if my abs, if my hypothesis is correct, which I expect it to be not sure, but I expect it also to be weaker than what you're talking about. But if it is true, then it would also go in the opposite direction. And so you would have a benefit to a potential benefit to men being mentored by women. But you could have second order female mentorship in which a man who had been mentored by a woman might be might be less competitive, say with his male mentees than he would be if he had been mentored by a man himself.

**Bret** 52:07

Yep. And certainly this being a complex system, you would expect many such effects to be over layered with each other and figuring out which ones you know, had, what strength of effect would be, you know, a whole line of inquiry that might, might arise here?

**Heather** 52:21

Yeah. So I'm reminded that you're going No, go ahead. I'm reminded of the conversation I had with with Tom on Impact Theory this week, which I don't think is out yet. But I was on his podcast this week. And we were talking a little bit about, about sex and gender, and roles in the workplace. And he said, he's, you know, he's a very successful entrepreneur, he said, I, Tom, when I'm leading teams that are entirely male, it's much easier for me. But when I'm leading teams that are mixed sex, they're more productive. And this is something I kept coming back to throughout our conversation, I thought that you know that, that is a beautiful observation, and I kind of Hope it holds, right, it doesn't surprise me that it's easier if it's all if it's all one sexy. And he basically, he used some of this kind of language that he did, I don't think he said, we take the piss out of each other is like I can, I can tell, you know, my, my teammates, even when I'm the leader, that they're being fuck ups, and they need to up their game, and it's expected. And if I don't do that, then they have no way to know. And the the work on mixed sex teams is slower. And I have to be thinking about these people's feelings in a way that I have to be thinking about these people's feelings. And it's, it's a lot more chaotic. But But he asserts, and this is not, you know, he's not being politically correct. he asserts that they are ultimately more productive.

**Bret** 53:40

Now. So I've got two things I want to get to I don't want to forget either. One of them is that that is suggestive of an analogue of hybrid vigor. And this is another point that I think we've been hinting around and we've made a couple times, but I really want it to be explicit. So hybrid vigor is the recognition and this is this comes from breeding This is actually a genetic phenomenon in artificial selection of things like farm animals, that if you take two purebred critters, and you breed them together, they often have extraordinary capacity relative to their parents, right? And there can be a number of reasons for this one purebreds may be hobbled by being purebreds. In other words, the inbreeding that comes along with getting a pure line can be destructive and so this can be liberating of that. But it also can be that there are advantages to borrowing from two mil us so to the extent that there is male and female wisdom and you have a team in which people are native to both of these languages, that team potentially if you can figure out how to get it not to trip over itself has both modes available. Yes. And so Okay, so the last point I want to make here is an awful lot of what is going on in academia. is based on the assertion that the characteristics of the person at the front of the room dictate whether or not the students in the chairs are going to be effectively able to learn from them. Unless you see somebody who looks like you at the front of the room, you've got a problem right? Now, my point would be that is nonsense. That is not to say there's no component of truth in it, I think that there is a going to be some positive effect of having somebody you very easily identify with at the front of the room. And some component of that will be based on superficial characteristics. But the idea that you should append a faculty in order to get people at the front of the room who look like the students, which is, by the way, crazy, because the students don't tend to look like each other. So how do you even do it without segregating, right? Can't meristem rich, right? But, but the idea that we should be refactoring the world so that, you know, the most important thing is that the people at the front of the room have the same skin color or sexual orientation, or whatever it is, as sacrificing

**Heather** 56:01

academic rigor for a failure of imagination on the part of students, right.

**Bret** 56:05

And you're also potentially sacrificing even to the extent that the world looks the way it does, because of unfairness to the extent that some people have the insight into how the work gets done. If you want to make the World Fair, whatever they know, has to be democratized. Right. And in some sense, that's going to make for very uncomfortable conclusions. Like, you know, you might want to, you know, have a male mentor if you're female, because it is going to make you a stronger competitor going forward in a world where some large fraction of the people you're dealing with are male, I don't know that that's where it comes from. But that's at least a viable possibility. So anyway, but the final conclusion here is that the demand by those who are outraged by this is that the paper be retracted. Right? And yes, there are some valid concerns that are raised about the methodology of the paper, as there always are, it is not hard to take almost any paper of any complexity and find things that weren't done well, that opened the possibility of some other explanation. It's very hard to do perfect work, right? almost never happens. But it appears that there is this motivation to find anything and everything wrong with this paper in order to justify the claim that it is so bad that not only does it need to be challenged, but it needs to be retracted because the damage that comes from it. And this is so much the ethos of the moment where, you know, a paper that is wrong, has to be held accountable for its error, whether or not that was the intent, because after all, harm is the you know, the end all and be all and people are certainly going to be harmed by the idea that, you know, that one might wonder about whether or not you know, wisdom is being tracked, properly transmitted based on the sex of the mentor. Right. So anyway, I just think this is emblematic of everything we're seeing.

**Heather** 57:57

Yeah, no, I think you're right. It's, it's conclusion driven. And this, the methodology is flawed, therefore, you must retract line of activists is becoming is becoming the go to line right. It's exactly the one that used against Lisa Lipman's work on rapid onset gender dysphoria, which is, I believe, the term that she actually introduced in the paper in question, and I believe in that case, I don't remember the specifics that it was pulled, and she did revise and went back out and almost nothing changed. And so you know, the the journal was able to basically say that they had caved to the activists, and the work is still out there. Because it was it was good work. And it's important work. But anyway, the point they're being at like, here, there's literally no information at all, in a claim, there are methodological flaws in a paper, that's Yes, you know, too bad. And that's part of what the peer review process is supposed to be about, and to find, and papers that are deeply flawed, should not be published, it cetera, et cetera, et cetera. But in this era, the claim that there are methodological problems is simply another activist tactic and should be treated as such. Yeah. Which is, which is a shame because legitimate methodological flaws that were not caught in peer review, do warrant a very careful critique. And, you know, and thought about whether or not a paper should have been published, but that's not what's going on?

**Bret** 59:20

No, it's not. And I would just say, even if your bent is that this is all about structural unfairness in the system, one interpretation of the papers that it has unearth a serious kind of structural unfairness, right? To the extent that this result is robust, right, it now invites a conversation about what might be causing it and it may be kinds of wisdom that needs to be transmitted in various ways. It may be just purely the bias of people downstream who don't take you seriously if you had a female mentor, who knows. But the point is, if it's a result, well, it's if the result is robust, then, you know, it tells us there's a phenomenon that we need to be finding

**Heather** 1:00:00

Yeah, there's a phenomenon that we need to be finding, the conversation needs to be allowed to be had. If you stop the conversation by retracting a paper, those conversations will continue to be how they'll just be underground out of you by the activists and, and and get stronger, frankly, I hope. But you know those two, let's say you just said two possible mechanisms of explanation, one of which is what we've been talking about. And one of which is, well, maybe it's about, you know, the bias of people downstream, we don't take you as seriously if you had a female mentor. I think that doesn't apply here. Because we're not actually talking about the standard definition of mentor, we're talking about people who've published with people as opposed to being a PhD advisors. But take that standard model, you

**Bret** 1:00:40

can adjust what I was saying was didn't doesn't he's not sensitive to which kind of mentor, in other words of people in your little field are aware of who you've published with, that can potentially be a factor. Sure.

**Heather** 1:00:51

Okay. I guess, I guess. So. I think if I if I'm, it's really hard to steal man position here. But if, if I'm going to try to steal man their position, I would say it's absolutely critical that, you know, even if we are reasonable human beings, and we can grant that there are different kinds of wisdom that have tended to travel on the male and female lines, and we would like cross pollination between them. And therefore, there might be benefit to having men and women working together, hey, look at that. It is still it is deplorable and apparent. And we must stop immediately in its tracks the bias, that is simply, you know, opposed to someone on the basis of some immutable demographic characteristic. stopping this conversation, because some people will use it to justify that bias, I think is what is going on in their heads and see I did a terrible job of stealing money. Like it's like, I can't do it. But I, but I do think that even though probably almost none of the activists know that that's what they're scared of. It's that it's this result will be used to justify a bias. And what they've imagined is the only explanation for this being beneficial is bias. And it's a little bit like, you know, the four to one ratio of male to female software engineers at Google, it must be bias. That's the only possible explanation. No, no, there are many other possible explanations. And I believe strongly that most of them have far more explanatory power than bias. Is there still bias? Presumably, yes. Should we be trying to eradicate it? Obviously, should we not talk about it in order to not give anyone any sense that there's bias? We're like, what, what was that? How did you even get there? Right? So I, so the activist response is actually counterproductive, even to their honorable goals. And as to their dishonorable goals? I don't know why we're playing games with them at all.

**Bret** 1:02:43

Yeah. So the whole thing a, I would say, you know, there are lots of cruddy. There are lots of people who aren't very good up in the upper echelons of science, and certainly in the vast ranks of those doing science. That said, the work is subtle. And there is a great deal that is learned as somebody who figures out how to wield these tools properly, comes to that not, and the activists are involved in a response to it, as if there was nothing there. And their basic point is, look, we can spot the truth. We know what the truth is. And so if you come up with a paper that's offensive relative to this model, that is the truth, then of course, you should retract it, why would we want anything but the truth in the scientific journals? And the answer is, you don't know what you're freaking talking about, you have no idea how complex things like sociality are, and therefore, you know how messy The truth is going to be. And the real question that they, you know, don't seem willing to ask is, you know, if we have the truth, which we don't yet, right, we won't ever fully get there. And so diminishing returns from it if we had the truth. How bad is it? Now, my sense, having spent all of my adult life in this game, is the truth is messy, but it's actually way better than it could be. Right. In fact, these problems are solvable, but we're never going to get there. If we're, you know, fighting over whether or not we're allowed to consider the mess, right. So anyway, I think I'm ready to get off my soapbox, but but there it is.

**Heather** 1:04:28

All right. Well actually think the next topic is is related to this, which is about Muir Woods and the querying of the National Park Service, which I can't even say without getting tense. By there. So here we go. Excuse me. Why is nothing working? Zach, would you show my screen here from Alan I came to be aware of this one call and right our friend Colin Wright, who's another animal behaviorist evolutionary biologist. Like we Are rights you? The world is going mad everything is politicized. I'm starting to think Twitter's real life I should take Heather Hines advice to go outside take a walk in the woods and just to get away from it all for a bit to clear my head, the woods, say, and here he's got a picture for those listening, not observing on to Muir Woods is this glorious Woods just north of the Golden Gate Bridge and we're in county in California. That we have spent some time in as adults and I spent time in as a child and just just glorious Redwood coastal redwoods, it says Muir Woods, clear woods. Muir Woods is highlighting queer ecology and the new perspectives it gives us in this forest. Queer ecology is the study of reimagining how people think about nature. It studies gender, sexuality, and behavior in the natural world. Queer ecology questions the way people categorize nature into binaries or boxes. For instance, a lighting here some boxes queer ecology challenges are male, female, natural, unnatural, and human nature. When was a time you saw something a new light, it says, so I'm going to give this sign credit where it's due, which is not much the categories of natural and unnatural and human nature are indeed very fuzzy. not useful categories within science particularly, and we should mostly drop them. male female is not in that group. Zack, can I have my screen back? Thank you, sweetie. I'm so caught. First let's talk about what it means to queer something showing nude So James Lindsay's new discourses, has a good description. There that page says as an ad this is this is their description from sources of what the actual people who talk about querying things say it so this is in sort of the scholar activists words, quote, as an activist framework, queer functions as a verb, to queer is to challenge the dominance of hetero sexist discourses or is quote a distorting a making the solid unstable. To put it another way queering is a complicating of the taken for granted hetero normativity of everyday practices, spaces and discourses.

**Bret** 1:07:22

Sign me up.

**Heather** 1:07:26

So this reminds me Actually, there's, there's a lot that I want to get to here. But this reminds me of the kind of naive, knee jerk thing that I understand what's happening in Silicon Valley, maybe even now, but really, in the arts in those sort of late aughts around disruption, disrupt it, that's what we're gonna do, we're gonna disrupt the thing, right, we're going to disrupt everything. And it's just, it's just this blanket impulse to mess with things that appear to be functional. Because sometimes when you mess with things that appear to be functional, one of a couple of useful things can happen. Sometimes it reveals that that thing that appeared to be functional wasn't functional at all, it was being held to it with some sort of a Potemkin thing that was just a facade and, and there was nothing real behind it. And sometimes it was functional, but only by destroying it, can you actually get to something more functional and more interesting. So those two things are real possibilities, right? But just disrupting to disrupt. I mean, that's what's going on in the streets of Portland with the riots. This is this is, this is simply a ridiculous approach to seeing that there are things in the world that you disagree with. Because, guess what, you know, this challenging scientific orthodoxy that's built into the scientific method. That's what we do that is that is what we do heterodoxy and orthodoxy are in this, this constant tension with one another. And, yeah, it's hard to get the fast held beliefs out. And apparently, it's disputed as to who originally framed this. But you know, marks plock apparently, originally said something in a longer winded form, that progress in Science Advances funeral by funeral, and that wasn't that's not actually his language. But the idea being that even when something new is discovered, the old guard doesn't want to see that it's true, because their entire careers are built on something that is that is different. And so you need to some degree, unfortunately, this is an unfortunate social truth of how it is that we come to understand and accept what is true that some, some people need to die before you know, rather than ever accepting it.

**Bret** 1:09:30

Yeah, I want to there's a big asterisk that needs to be there, of course back to it. But the you can have a culture of silence in which even those who are entrenched in a mindset because they've lived their entire career are of a mind to find what's wrong with it, and if it is incorrect to get to the correct place as quickly as possible, and unfortunately, it is the economics of the way we do science in the modern era that makes this so rare, but to the extent that what one is trying to do is come up with things that are right enough that they are very lasting and maybe the you know, the ultimate expression of that is something that is so right that it is permanently recorded as true, right? That incentive is very, very different than an incentive, a careerist incentive which we use as a proxy, and it is the careerist incentive. That is wrecking science. Yes. Anyway. Well, it's

**Heather** 1:10:26

no, that's absolutely right. It that is, I would say that's one of the incentives that is wrecking science. Maybe the financial incentives associated with NSF and NIH are sub incentives below that. But so, you have Thomas Kuhn writing in a different era, in the 60s when he wrote the structure of scientific revolutions pointed this out, and actually, he also brought up plunks observation, in talking about paradigm shifts and talking about and your the way that I've framed this, both when I'm teaching philosophy of science, but just in everyday life is that you know, there, there are a lot of ways to categorize the different types of science and one of them is you can do sort of brick in the wall science where you assume that your foundation is solid, and you're doing something that's going to create another little little piece that supports the foundation on the wall that's already being built. But you excuse me, you build that wall a little bit higher, or you can do something that is paradigm shifting. And, and you don't want to be doing like most people don't have an in them to do paradigm shifting science. They'd mostly don't have it in them, most people to do paradigm shifting science. But that doesn't mean that if your foundation is unstable, there's any justification for doing brick in the wall science, most of the science being done is brick in the wall science, if the foundation is solid, that's good. You're you know, it's sort of you know, it's worker, bee science, that's great. Only if the foundation is solid, but of course, you then get all the worker bees up in arms at the point that someone is trying to destroy the foundation. That is how this works this like this, this, this bringing in of heterodoxy into orthodoxy and science, not through flat out disruption, and queering, the woods and all this other garbage that simply is confused about what we actually know, is lying about what it does know that we know and is looking to destroy, frankly, you know, everything associated with science and discourse about it.

**Bret** 1:12:32

The fact that this shows up here, and so I don't know what queer ecology is, because it didn't exist when we were studying in grad school, and

**Heather** 1:12:43

I've got a partial answer for you. Oh, you do? Oh, do

**Bret** 1:12:46

you want to go there now?

**Heather** 1:12:47

Before you? Yeah, sure. Let's see. So this this sign was posted for the National Park Service that the sign that we just showed you, and it also inset in fine print at the bottom that this exhibit is federal property destroying and removing it is a misdemeanor punishable by a fine of up to $100,000 one year imprisonment or both? With what exhibit this size? I believe, I believe, right, so that that itself is a little terrifying. Okay.

**Bret** 1:13:17

Even if there's a strong argument to be made, that you are in fact queering that sign by removing

**Heather** 1:13:23

Ah, yes, yes. That will be the argument in court. I think

**Bret** 1:13:28

that will be my defense and it will fall on completely deaf ears. I have the sense but nonetheless,

**Heather** 1:13:33

yes. So National Park Service, excuse me did have a ridiculous page supporting these claims. But here we go. Just briefly, Zach. Here's what's happened to that page. They've taken it down page in

**Bret** 1:13:45

progress. I'm not sure I would define it as progress. But then

**Heather** 1:13:49

on a separate access into the NPS site, the National Park Service, they have a video and I don't come on. I'm not sure here Actually, we probably can't. Yeah, so I'll just I will tell you what some of is being said here. This is a someone who's not identified as a part guide, but a gay part guide, talking about queer ecology. And what he says is that speaking for the National Park Service, he says that male and female are quote boxes that humans have constructed. He then provides us evidence he's got a few more Park guides who identify as things like lesbian Park Ranger and, and such like they all have these adjectival things in front of their description that would actually allow them to speak smartly about things like redwood trees. So the evidence in this video put out by the National Park Service, for the claim that male and female are boxes that humans have constructed include these three things you ready? I'm sitting down, you are sitting down, okay? The three pieces of evidence that human male and female are boxes that humans have constructed our plants are capable of asexual reproduction. This process of reproduction is not the male female story it is the redwood story. That's a quote from one piece of evidence. Male and female are boxes that humans have constructed to second piece of evidence. Banana slugs are hermaphrodites. point of order. hermaphrodite means you got male and female on one body. To define hermaphrodite you need to use the concepts that are real of male and female.

**Bret** 1:15:40

Also, it is debatable whether or not humans actually constructed banana slugs. Alright, sorry, I'm having trouble taking this seriously, I will do better. This is exactly

**Heather** 1:15:52

the third I actually it sounds like a five and a half minute video. And I actually didn't get to the but so there may actually be more evidence or third piece of evidence that I was able to get through in this video. That evidence that male and female are boxes that humans have constructed. We have plants of asexual reproduction. They're hermaphrodites in nature and same sex interactions exist.

**Bret** 1:16:19

Again, debatable. And the

**Heather** 1:16:21

example is a kitty, not 22 species of bats and 25 species of butterflies engaged in same sex interactions. I don't know what that means, like, I don't even know if they're talking about like homosexual interactions. And I'm not sure they are. But they don't even say that right? And they've got pictures of like, butterflies just hanging out together. This whole thing is so insane. And this is the National Park Service. This is the National Park Service they need they need our help they need someone's help this is this is ridiculous. Well,

**Bret** 1:16:51

okay, at the risk of creating a larger Firestorm, then than we otherwise might, I would point out that there has always been something a bit fishy over in the discipline of ecology, and

**Heather** 1:17:07

oh boy, you're going there,

**Bret** 1:17:08

I have no choice. And I will say that some of my favorite people in fact, some people I consider mentors have been excellent ecologists, excellent ecologist exist. But it is also the case that a large number of people who arrive in biology graduate school and decide to study ecology are motivated not so much by a desire to figure out what's true, as a desire to do good in the world, which I think we have to respect. Doing good in the world is a powerful and noble motive motivation. But it is a terrible motivation inside of science, because what it does is it tends to get you to do things like discount conclusions that are awkward, and elevate conclusions that may be false, but go in the proper direction for whatever your political ideology is. So if you're wondering what the hell I might be talking about, I will remind you, Heather of the recurrent incident, which continued to be broadcast and spread after we were long out of graduate school, where ecologists would survey things like textbooks for incidents of the word, cooperation and incidents of the word competition, and then they would compare these two numbers and conclude, I kid you not, that these books were biased to a certain degree based on the the excess of instances of the word, competition over cooperation. And then as I recall it now I first time I encountered this I was a young graduate student hanging out in ecology labs, listening to what was being said, but the claim was that the reason for the bias in these textbooks was capitalism. That

**Heather** 1:18:50

I thought you're gonna say the patriarchy I was ready for

**Bret** 1:18:52

that. Oh, what do you think Kappa capitalism is just the friendly side of the goddamn patriarchy. We all know that but

**Heather** 1:18:58

well, you know that at your meetings, but I'm not invaded. It is

**Bret** 1:19:02

never that never needs to be said at the at the meetings of the patriarchy. But, but the point is, look, sorry to break it to you. But competition is more fundamental than cooperation, which isn't to say that cooperation isn't fascinating in its study isn't vitally important. But the fact is, you can, you can build an ecosystem with no collaboration in it. You can't build one without competition in it, just the simple fact that you have built creatures which will use up the resources that they have will reinstitute competition every single time no matter what and nobody has to collaborate with anybody else. So the point is, there's something over in ecology space where do gooder ism gets mixed in with science and what you get, you know, next thing, you know, you're you're querying forests.

**Heather** 1:19:52

Yeah. Well, two things. Oh,

**Bret** 1:19:54

wait a second.

**Heather** 1:19:55

Yeah.

**Bret** 1:19:56

You know what they're doing. They're cutting Oh, God, oh boy. Yep. I feel pretty good about it. Now we'll see if I'm canceling.

**Heather** 1:20:08

Okay, two things. I don't want to say in response to what you just said, Oh, a statistical point about, I remember when you came home from the seminar where you first heard that, that amazing thing that some of our peers in graduate school had done surveying textbooks for the words competition and cooperation and concluding that there that, that the fact that competition showed up more than cooperation, demonstrated a bias in the people writing the textbooks and indeed, in the scientists. They, at the time, I believe that you reported that they had even done a statistical analysis, yeah, and that they had done a chi square test. chi square test is maybe my favorite physical test. And okay, it's a little weird that I have a favorite Siskel test, but in part, I love it, because you really can do it on the back of an envelope, you can actually do it by hand, and you just need like one little table of, of critical values to compare your result to so it's, it's, it's easy. And with the right kind of experiment design, you can actually like in the field, know whether or not you found something that might be significant. But it is of a class of tests of a bigger class of tests called goodness of fit tests, right? Goodness of Fit tests, are basically at a an explicit attempt to compare your observed values, the values of data that you have recorded by going out in the field and taking data to values that you expected to get, and seeing if your observed values match your expected values. If they did, then there's sort of no pattern to explain. And if they didn't, then there's something to explain. And hopefully, it's your hypothesis if you've designed the test well enough, that explains that pattern. They use the goodness of fit test, to assess whether or not cooperation and competition are showing up at the appropriate levels. And these textbooks, I would put a lot of money on the idea that they're expected results that the effectively the hypothesis that they went in with which they turned into an assumption that they based the entire analysis on was these two things being, you know, pretty common out there in the world should have been showing up at equal rates in these textbooks exactly what they did, right. So you, there is no way that you should assume the cooperation and competition are showing up at equal rates in the world. And then I'm assuming that means that they that they didn't do science, right, that they that they actually didn't do science, and they fed their assumptions in so that the only thing they could find was what they did find. And they also didn't use the statistics, right? They broke the assumptions of the statistics, all of which happens a lot in published science. And it's terrible. And I wish the people were doing better science all the time. But yeah, so that's my little statistical rant for the moment. Well,

**Bret** 1:22:53

I mean, look, this is. So first of all, I should say, I certainly tried to point out the problem. Even in that, I mean, I believe this was first year grad school and you know, you're circulating in different labs to see what labs are doing something you might be interested in joining in on that kind of thing. And, you know, it was just obvious, this made no sense and right, I wasn't smart enough yet to know that, if I said that bad things would happen. But you are. Yeah, that's also probably true. But But anyway, I did try to point this out. And it would seem an obvious point that once if you had, if you had missed it on the front, on the first pass, it would seem that all it has to happen is that it would be pointed out and they'd be like, Oh, yeah, of course. But that is not what happens. And I, I don't I'm hesitant to connect this back to our last conversation about different kinds of wisdom. But the point is, you want the people with whom you are collaborating in science? To do you the favor of pointing out what's wrong in your work? Yes. And then by the time that you go out there into the scary world, and you give your talk in front of a bunch of people, you don't know, you've already been through what's wrong with it, and you've gotten rid of the vulnerabilities, and you have the answers to the questions they're likely to ask. But If, on the other hand, you take this noble instinct to make the world better by finding all of the conclusions that are friendly, right, what you end up doing is you create massive vulnerability, because you don't even know what's true anymore. And so, you know, at some level, this is just a dumb battle between people who, you know, prioritize what's true, in spite of the fact that a good deal of it may be awfully awkward, right? And people who reverse those priorities and the fact is you do not want people who reverse those priorities in charge of truth seeking, they can't be it will drive you mad, and that's where we are,

**Heather** 1:24:53

and earning credentials that give them authority to say that they're scientists and therefore speaking, as if they are being scientific, when they're Not

**Bret** 1:25:00

right now. And after all, I mean, you know, the what conclusion are we dodging here with the querying of various woods, right? We're dodging something as simple as male and female are real categories that have existed for hundreds of millions of years that we humans find ourselves with this pattern inflicted on us in a highly unique way. Male and female in human beings is not like other examples. It's a it's a very different phenomenon. And it's also a phenomena that is so heavily based in software that is much more amenable to us reworking it based on our values than it would be if we were any other species. So that's great news. We're dodging this great news in order to just like, force the truth to do what we want. So we don't have to deal with the complexity of it. And it's madness. Yeah, and

**Heather** 1:25:57

I mean, just really incoherent. Your read would burls prove that female and male are human constructs. No. Male and female are 1.2 billion years old, in our lineage at least 500 million years old. not new, not about us. This is a this is religious fanaticism and incoherent religious fanaticism at that. It's, it's destructive. I can't believe it's coming for the forest. Right. And, and I hope, I hope someone does take that sign down.

**Bret** 1:26:34

And I hope they get away with. Yeah,

**Heather** 1:26:37

so just one more thing on this ridiculous topic. And I suspect we're way over an hour at this point. Yeah, one more thing on this topic. And then I wanted to finish just by talking a tiny bit about gratitude, if I may. Excellent. But first, I am not grateful for the hashtag, LGBTQ stem day, which showed which apparently LGBTQ stem day was on November 18, I was lucky enough not to run into it on the day of, I'm not sure so it's like, Don't show my screen yet. I'm gonna ask your dad here. If he thinks I should. Show I'm going to read this. But I'm not sure. What do you think? Should I show

**Bret** 1:27:19

this? could take me a second to process it. Okay.

**Heather** 1:27:22

So this person says a day late. This is a tweet a day late on hashtag LGBTQ stem day. But I think it's important to be visible because so often academics and scientists try to minimize my queerness under some false sense of impartiality. But the fact is that my queerness matters to my work, and it matters to how I do science. I'm proud of that. So I don't think we had to show that. But that is a sentiment that, so perfectly capstones, the conversation that we just had. And it's so dangerous, the idea that your queerness matters to how you do science. If that's true, you're not doing science, you're queerness, whatever that might mean, may well impact the kinds of questions you're interested in looking at. Cool. All of our biases, our personal histories, our developmental weirdnesses affect what our preferences are, and how it is that we view the world and therefore what we're interested in, and preferences, drive, and market forces, unfortunately, but preferences should be driving what kinds of questions scientists ask, once you're actually doing the science, though, once you've actually decided, Okay, I'm going to look into this question. Nothing about your queerness or your lesbian ness, or the fact that you're from Idaho, or Bangalore, or that you're disabled, or that you're tall, or that you're pink or that you're black or anything should have anything to do with how you do your science. If it does, you're not doing science. That's it's not science, if you're letting your adjectival descriptors affect how you're doing the work inside of the science, it affects what questions you ask it will. Sure and I would rather it not be driving whole, whole endeavors like I'm going to I'm going to see about investigating this from you know, I'm gonna see what kinds of questions might be asked with a with a Queer Eye. Right. I don't think that's particularly honorable. But okay. Once the questions asked the once you're involved in, in trying to answer a question scientifically, none of these things that are true about you should have any effect in how you're doing the work.

**Bret** 1:29:32

And what we have said elsewhere is that the value of science comes from the fact that it corrects bias to the extent that you see biases integral to it, you know, it's the opposite of science. Science is the thing that tells you what's true in spite of what you may expect or want to be true. And if you rob it of that capacity, then I mean We're heading into a dark age and many people have now observed this. I've been saying it for decades now that this was dawning. A dark age is dawning because we are taking the liberty of correcting the scientific record rather than just recording what it's telling us and grappling with its implications.

**Heather** 1:30:18

Yeah. All right. Okay, one one last thing, then. Yep. All right. So back in March, Thanksgiving is coming up, right. And back in March, we had no idea. Most of us that we might still be stuck in COVID lock downs and, you know, possible ends in sight. But, you know, our children, for instance, have not seen the inside of a classroom since March. And who knows when that will change. I posted this thread this was actually before our first live stream, and I just, I just want to read it and then invite everyone else to think about what they're grateful for. Because all of these things I am still grateful for now, and maybe even more so. I created a hashtag gratitude in the time of Coronavirus, invisible path from March 18 and invisible pathogen races around the planet. As we swell self quarantine to slow it spread many of us feel more isolated than we could have imagined. And yet the global nature of the threat threat proves that we are all in this together. I am most grateful for all the usual things. My husband and children, all of my family, my friends, my health, or health. I'm grateful to have a comfortable bed in a warm house in a beautiful place. I'm grateful that clean water comes out of my tap and I am grateful that it warms when I asked that of it. I'm grateful for the utilities that keep the water flowing and the appliances running and the devices charged. I am grateful for the ability to cook and for delicious nourishing food. I am grateful for good coffee and rich cream and a handmade mug. I am grateful for the luxury of bespoke drinks. I am grateful for humor. And here I quote tweet someone who says work from home tips. Have a routine, showered dressed like normal. Keep a dedicated workspace fill a briefcase with sausages and carried at all times. Stick to usual work hours. Never let raccoons trick you into twisting them with a briefcase. They do not have your interests at heart. My next tweet in this thread is I am grateful for the animals with whom I share my life even when they resemble raccoons working in angle to get into my beef case. I am grateful for beauty. I'm grateful for books. I am grateful for music. I am grateful to have a beautiful functional bicycle built for me by my also beautiful functional husband. I am grateful to taking this bicycle out into the world will continue to be possible in the coming weeks and months. I am grateful for soil and plants and gardens and gardening. I am grateful for spring. Hope it comes back. I am grateful for nature. And here I quote tweeted myself from five days earlier in March 13, in which I said engage in social distancing to help flatten the curve but don't nature distance. walk in the woods in parks and mountains and on the coast. Keep your distance from other people but not from the sun and fresh air. Get and keep your body moving. Don't put your body on lockdown. Correction I'm grateful for most of nature, not mosquitoes mostly or leeches or ticks or fleas or Plasmodium malaria and not coronaviruses. Still, this leaves an awful lot to be grateful for and there was more so much more. What are you grateful for? That's hashtag gratitude and the title Coronavirus where we have Thanksgiving and a few days and we will be having it as we always do with our boys this time only with our boys and and our animals. I am I am so grateful for this life that we have together.

**Bret** 1:34:05

Yeah, it is remarkable. So if I may riff briefly on that beautiful sequence. I was charged with writing the foreword to a famous photographers book this week. And it caused me to think a lot. I am an amateur photographer, but I was looking at the amazing photographs in this book, many things that you and I have never seen in person. so beautifully captured. And I was moved to think about the fact that this moment in time, not just the incredible accident of our being present on this planet and being creatures that are capable of understanding what it means to be present on this planet and what else might be here. But just the simple fact that modernity allows us to know about the many wonders of the world in a way that even a few 100 years ago, you couldn't have known what was here, even if you had reports of what was here, that it was very difficult to separate fact from fiction. And so you were left with kind of rumors of Earth, and that there is something about the technology, which is often frustrating and is obviously in some sense driving us mad. But that technology is also giving us a great gift, which is the ability to know what's here. And for this brief moment that we are present Cognizant on earth to have access to some large fraction of the marvelous things that are out there, I think is it's an amazing gift. And we just don't, we don't think of it because it feels like okay, well, you're on Earth. It's a big diverse place. And it always has been But no, even though it was most people never knew. And we can,

**Heather** 1:35:57

yeah, we have access to much more than we have. And hopefully we will have access again, too much of it in person soon. But but right now we have access a tremendous amount over over the airwaves.

**Bret** 1:36:11

Yes. And hopefully, people will realize what it is that we are putting something at stake that it is not our right to destroy, and the recognition of almost no matter what the gift that life is even under terrible circumstances, the gift of having life for a time and being able to tune in on the strange planet and to, you know, to partner with other members of your species and all of that, that that is such an amazing opportunity that I think we have an absolute moral obligation to attempt to deliver it in as high quality as we can to as many people going forward as we can. And that that really it forces one issue to the top of the list above all others, and that is, how well are we preserving this? And the answer is terribly and we must do better.

**Heather** 1:37:08

Yeah. When I wrote that thread that I read, we were only a couple of months out from having been in the Amazon. We spent a couple of weeks in January of this year at tipa teeny, teeny biodiversity station, a research station deep in the Ecuadorian Amazon at what has been measured to be the most biodiverse spot on the planet. And it's one of my absolutely favorite places on earth. And we, we might dedicate an episode coming up or more even to talking about it. But the founder and director of of tipa cine recently reached out to me again, we're friends, all of us are friends. To say it's, it's suffering, and it's not just suffering in the way that we saw it suffering where we were beginning to see declines in insectivorous birds, for instance, where we've only been there a few times over a relatively short span of time, just two years, not decades, and we can determine we can discern a decline and decline and butterflies decline and a lot of the clouds that's to bats. Yep. But also now there's, not only is there pressure from from oil drilling and the financial pressures, but there's also financial pressure just from the university sponsors, who are saying we're not sure that we see the value in, in having people go spend time in nature and learning what kind of diversity there is. So yeah, we will be talking about this and we hope, we hope to do something that can help turn turn that tide somewhere,

**Bret** 1:38:51

we must, I will say it's the I think the third time we've seen a version of the same myopia, right? The the decision that natural history was somehow not fully scientific or worthy of investment. Seems, you know, at a bean counter level seems very reasonable, right? Natural History is sounds like stories, but

**Heather** 1:39:13

it doesn't require big expensive equipment. And so it doesn't bring in big grants. Yep.

**Bret** 1:39:17

But it's actually the way you figure out what you might be missing in nature that the patterns that you can see in the way creatures function. You know, it's the, in some sense the root of of good natural science. But we've seen it also in you know, we were mentored in the museum of zoology at at Michigan and the Museum of zoology was very quirky weird place I mean, it was an actual museum with a you know, public exhibit side and then floors of science research going on.

**Heather** 1:39:52

And row after row dead lizards and jars, that sort of thing. I row

**Bret** 1:39:56

after row of creatures that had been collected and at some point The, the school decided to ship those things off because the collections seemed to be an expense that wasn't justifying itself. And again, it's the same myopia, which is that you don't necessarily see the role that these things are playing in progress. And so you make some sort of expedient decision that's catastrophic to something but you know, because the connection is not explicit, you don't spot it.

**Heather** 1:40:25

Yeah, I mean, let's let's talk about museums more for sure to another episode. Just to be clear, they did not get rid of the collections, they just they move them to an off site location where they're hard to access, and no one runs into them. You can't, you know, they no longer act like a library, you can't sort of walk through, if you're a graduate student or a professor, and look and say, Oh, I didn't know I didn't know that was in South Africa, whatever it is. So just like moving, just like the decline of stacks of actual physical books and being able to wander stacks and library has real effects on the nature of discourse and intellectual progress. So too, will the hiding behind lock and door lock and key. The specimens involved in zoological collections almost certainly affect what kinds of questions people come to ask.

**Bret** 1:41:16

Yeah, so there's probably a name for it. But I think maybe in that discussion, we should figure out what the category is of things that are essential, but because they are not visible in the progress are often dispensed with. Because it seems to me that that's a key to what is going wrong in many different places. And we see it with the philosophy of science, with my hypothesis testing with proper scientific theory, all of these things, along with natural history museums, library stacks. And it would be, it'd be cool to see how far we can get on that topic.

**Heather** 1:41:58

Yeah, definitely. All right. Are we done? I think we are done the first half. It was a long first half

**Bret** 1:42:05

long first half, we should have warned you up top to file your questions for the second half. Also like subscribe, notify, comment, fake your fist at us, whatever you have to do, you know, just do it.

**Heather** 1:42:19

Join us join us at our Patreon. So if you will, there's a Discord server, get access to there with what I hear is very good conversations. You can also go to either of our websites to sign up if you want to be notified when our book is available for preorder. It's not going to be published until the second half of next year. But it is it is well underway at this point. Clips channel is alive and well. Things Oh, and you can always email Dark Horse dot moderator@gmail.com for any logistical questions like how do I pose a question? What is the private q&a? That sort of thing?

**Bret** 1:42:58

Yeah. Or if there's something we've said that you think needs to be cleared? That would be the route in? Yes, try

**Heather** 1:43:04

querying the Dark Horse moderator first. See how far you get with that. No, we're not very, but go for it.

**Bret** 1:43:10

All right. Yeah, we'll see you shortly. Be well