Bret and Heather 45th DarkHorse Podcast Livestream\_ Smoked (...

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**SPEAKERS**

Bret, Heather

**Bret** 00:13

Hey folks, welcome to the Dark Horse podcast live stream number 45 hard to believe it's number 45 already with time standing still How have we done so many live streams? It is hard to imagine it's hard to imagine I found myself tweeting about where we were in history and claiming that it was still August even though we were nearly halfway through September at the time but I'm not embarrassed I'm just I'm going with it.

**Heather** 00:41

Yeah I feel like our particular situation here and personalities and living situation allowed us to get through lockdown which is still persisting with a fair bit of grace. But the effective lockdowns at the fires have have caused now in the Pacific Northwest are actually really doing a number on both of us being actually forced to stay inside and still having air quality inside begin to decay because no building is completely smoke proof is well it's actually it's exhausting on top of everything else it's actually tiring to to feel this kind of trapped

**Bret** 01:22

yeah it's a it's both physically tiring I have a feeling that you know I feel I'm doing better with the smoke than I would have expected but it's it's beginning to be physically tough to just deal with it day after day. Yeah, but also you and I have obviously been talking about the fact that we were lucky to be locked down as the weather was getting nicer and the days are getting longer. And we were fearing what would happen when winter drove people indoors and the fires have created a little taste of what that will be like and I must say it really does increase the challenge so much because yeah, the loophole in COVID was that outdoor was was safe well

**Heather** 02:05

this is I mean this is I think worse because going outside you're even when you're masked and you know we don't we don't have surgical masks so it might be better if you actually had an in 95 but your lungs and sinuses start to hurt pretty quickly at this level of smoke at least at least for us and so you know one of the beautiful things about the Pacific Northwest is that basically you can dress for almost any weather condition and go out in it and most of those weather conditions won't be your preferred weather condition but you can you can deal with it and this this actually just doesn't allow for that you know we have I have saw something my one of my weather apps today that actually hadn't seen before I've seen dense fog advisories. We've had now for days apparently a dense a smoke advisory and we've got our our wildfire evacuation zone here in Portland is getting downgraded which is to say that the the areas in Clackamas County that are in these sort of get ready to evacuate zones are receding somewhat but the fires are still completely uncontained. And the rain The Promised rain didn't come and hopefully it will come soon. But it sort of it feels like this. This endless endless awfulness. difference between this and early COVID. lockdown is you look out the window and you see sort of the yellow toxicity in the air.

**Bret** 03:26

Yeah, I looked at the weather app, dark sky, and it said, Winter is coming and full of Terrors. Thought suggested and not too careful reading of Game of Thrones, at the very least. Yeah, absolutely. But yeah, it's really it's really tough. And it's day after day, it really has taken even the strange way that time was proceeding before the fires and seemingly grounded to a halt. Just it constantly looks the same out the window and very bleak. Yeah.

**Heather** 03:56

Yeah. So for those of you not in the Pacific Northwest, congratulations ganya. And for those of you who are I expect, you know exactly what we're talking about this is this is different from anything I've experienced before. I did want to start today by just doing a little follow up on you know, we spent almost all last episode talking about the fires and human history with fires in the American West history with fires. And I wanted to do a little follow up on that and a little follow up on the other thing we talked about in the last episode, which was the Netflix distributed film, cuties. Okay, and then and then get into all sorts of other stuff, including, I promise we're going to talk about virgin birth and snakes before the end of the hour. I mean, because when don't we, I tend to, yeah. Okay, so let's see. One thing I wanted to say is that the lead author on one of the papers we talked about last time, which found when we pull this up, which Oh, this is the paper that looked at fire climate interactions in the American West. For the last over 600 years, and was doing this, you know, very nuanced careful analysis of the factors. And the, the factors leading to the particular moments of high fire activity has now published really good op ed, this is a woman's name is Valerie true true Ed, and that look up how to pronounce it. So I could show this just briefly, in The Guardian, and near the Guardian is, as well, on the other side of the pond is New York Times is on this side of the pond by a lot, but this is, this is this is quite a good op ed. And I think, you know, because because this researcher, she is I think she's a Denver chronologist. So her background is specifically in looking at tree records and assessing not just age, but sort of you know, climatic and weather events from tree rings. She She argues here as she did with her co authors in this 2010 paper and as presumably many times since, as we did in our last episode against the 20th century regime of fire suppression in the American West. And for what we were calling following. It was like a 1991 paper or something. Pyro diversity, which I just kind of like the term and so I want to keep saying it that the the idea being that more types of smaller, more heterogeneous fires in the American West, and presumably anywhere where there is a normally recurring fire regime will actually increase lots of things around ecosystem health, but specifically, the measure that I found evidence for was biodiversity.

**Bret** 06:38

Alright, I'm not buying this pirate diversity thing at all, really not fallen for it. This time. I'm doing Pyro equity. That's what I want to say, Oh, no. Yes.

**Heather** 06:47

So all fires have equal outcomes. Is that what we're shooting for?

**Bret** 06:50

No, I think it's more like the burning of white people, I don't know. But something good. And the conversation grinds to a halt. Yeah, we're only minutes in only minutes.

**Heather** 07:01

And yeah, so one of the things she says in this, in this very good op ed in The Guardian is we cannot reverse the anthropogenic heat and forest drought situation that we have created by what she's referring to climate change that portion of the increased fires in the American West that are attributable to climate change. She says we cannot reverse that situation, at least in the short term. But we can aim to reverse the effects of our century long fire deficit. And so this, I think this is exactly the kind of analysis that we need, we're not, she's not pretending. That long term. We don't have the ability to nor do we have, nor do we. And we have the need to actually address the anthropogenic anthropogenic climate change the 30 to 50%, by the numbers that I was finding and reporting on last time, of the increased fires in the West are attributable to anthropogenic climate change. But there's an awful lot left, that needs to be explained. And some of it is there will always be fires, and, but you know, a fire, all fires are not created equally, of course. And so the sheer, the rapidity of the spread of these fires, and the absolute terrifying damage and death that they have wrought, is not a normal feature of an American west burning, as far as we can tell, either in modern times, or from like tree rang and pollen core studies.

**Bret** 08:24

So there are a number of ways to look at this one, I would say, I saw this article I also saw there was one in pro publica earlier this week, with the title something like given that we know how to stop these fires, why don't we Yeah. And I read it, and it mirrored almost exactly the perspective that we advanced off the cuff on our last live stream, which was, you know, reassuring? It did,

**Heather** 08:52

he was off the cuff for you. But I had done some preparation, you had done some

**Bret** 08:55

preparation. But in any case, the problem here is that we are again, wandering into a politicized landscape, which makes it impossible to do what needs to be done, right. So at some level, we're looking for an analysis that says something like the following. We have an entirely anthropogenic pathogenic problem. Some of that anthropogenic problem can be addressed with solutions that we have, and some of it is now outside of our control. To the extent that we have altered the climate. That is not something that we have the technology to unaltered at the moment, to the extent that we have altered the fuel load through a naive pattern of fire suppression, we do have the ability to address this and again, as I said in our last livestream, the key question is one of equilibrium. Yes, if you think about the fuel that ends up accumulating, if you prevent fuel from burning off, it accumulates on the forest floor, or as you know, decaying biomass and then when a fire does come, it's hotter and bigger than it would otherwise be. It may take out A species that are otherwise built to deal with fire. And so the real question is how much stuff has built up ready to burn. And if you are removing one of the processes that eliminates that stuff, then you will have a disproportionately large amount of it, which will cause an ecologically unusual phenomenon. So you have to get back to equilibrium somehow, or you have to set an equilibrium that you now know how to manage. There's no two ways about this.

**Heather** 10:25

Yeah, no, I agree with us. the only the only issue I would say with what you just said is that you lead with, we have an entirely anthropogenic problem. And I'm not sure by what analysis you arrive there, you know, the the West, the west coast of North America, unlike the East Coast, for instance, tends to burn regularly, even absent modern levels of population density, industrialization and agriculture and, and it seems even before there were people, you know, the pre Columbian people, the first Americans were here, setting regular fires to do a kind of landscape management. You know, we have Paulin corps going back, if memory serves from the last livestream, like 200,000 years, and there have been regular fires. So that's exactly what I'm saying. But so in what so obviously, fire in the American West is not entirely an anthropogenic, anthropogenic problem.

**Bret** 11:13

The problem is that the disaster is anthropogenic fire is natural. And the point is, what does fire look like under normal circumstances? Well, it looks like a pattern in which you'd get chaotic, sparking from lightning primarily. That results in places that have accumulated more fuel being more likely to catch fire, and then it's spreading to a point and burning out. And is it that California would catch fire? No, it's never been that way. pieces of California will catch fire, while others have so recently caught fire that they're not vulnerable anymore. And so what you get is a natural patchwork dynamic in which the ecosystem, the species that are in the location, are adapted to the fire regime, because the fire regime has existed for millions of years. Everything functions this way you walk in, it can't be exactly like that anymore. But the naive thing is to assume that you can just simply intervene and bend it to your will. And the answer is nature bats last Right. Yeah. It has the capacity to, you know, yes, you can suppress fire for 100 years, and then what happens then you have these mega fires that you can't manage, right? So what we need to do is recognize that the wise approach is the one that disrupts the regime that functions as little as possible, which doesn't mean zero. But the the pro publica article mentioned, all of the stuff we talked about, it mentioned the fact that sprawl is causing a problem, the fuel load is causing a problem. And I should say the president said something crazy about trees exploding, which he got dragged for on Twitter, but in some sense, what he was struggling to articulate was this point about fuel build up trees exploding. Okay, well, he said something crazy. And, you know, true to form, it was sort of off the cuff nonsense,

**Heather** 13:11

but what I'm going to remain blissfully unaware of the specifics. Perfect.

**Bret** 13:14

Well, anyway, what he was talking about was the accumulation of fuel lines, impact on fire regimes. So the point is, you know, everybody's aware of this problem. Yeah, what point are we going to modernize our approach? Yeah.

**Heather** 13:27

All right, well, one more thing to say about fires to follow up from last time is, is an observation from some some zoom Earth, real time satellite images, if you would show the screen. This is this was sent to us by a listener with considerable background in this kind of, in this kind of analysis, and said, Just take a look. This person said, Just take a look at what the fires in the Pacific Northwest specifically in Oregon look like from the beginning of September. And so without saying anything more about them just gonna move through September first. A little red things are no fires, obviously, and we've got cloud cover, second, third, fourth, fifth, sixth, seventh, eighth, ninth 10th 11th 12th and we've got smoke as well as the atmospheric stuff 13th 14th 15th and that gets us to today. So let me just go back to the seventh where for those listening only and not watching, you see some fires scattered throughout the Pacific Northwest. In Eastern Washington looks like like the Okanagan in East, central or Again, a few little ones in Oregon, and some certainly up in sort of trendy Alps area, and such in Northern California, and then you go one day forward. And suddenly, we've got a tremendous number of fires, and no roads aren't on here. But to anyone familiar with Pacific Northwest, it looks like a line of fires along the five along the interstate five to me. And I'm not saying that is what it is. I have not mapped this onto the five. nor can we say at this point for sure what exactly is going on. But we know, we know for sure that at least some of the fires that have been that have been happening the Pacific Northwest in the last couple of weeks, were arson were humans that were intentional. And the fact that you have a sudden upsurge in the fires all along a line that is easy to access on one day, is certainly suspicious. And what we see is what looks like sort of a knee jerk rejection of the idea that any of the fires are arson from the official sources, at least in the state of Oregon, which, you know, given how busy everyone is right now, the idea that effective analysis has already been done, and they can completely rule out our son for any of these strikes me as itself, an indicator that perhaps something's being covered up.

**Bret** 16:26

So let's just do this correctly. There are processes that could associate fires with roads that have nothing to do with arson sample, people sometimes pull a car onto a medium that has grass in the hot exhaust, absolutely, the car can catch stuff on fire. It's usually completely obvious when this has happened in general, these things, you know, catch grasslands on fire, and they're quickly put out, but not always.

**Heather** 16:56

There was a severe wind event that was happening, there was a severe

**Bret** 16:59

wind event. There are of course, you know, people find patterns. And of course, it could be that, you know, the pattern was the wind regime, which dried things out and then you know,

**Heather** 17:11

a lot of cars that broke down and got got the grasshopper under them and set fires that otherwise wouldn't have wouldn't have become raging infernos. Yep.

**Bret** 17:19

Or sparks that would not have ordinarily triggered fires might under those unusual conditions from money, many sources of produced fires, could be accidents. I mean, people don't fling cigarette butts out the window the way they once did from their cars, but things like that. So there's lots of stuff that could create a pattern, including it could be random and look like a pattern to us. You know, because sometimes random points line up. On the other hand, what I think we do know, is and I thought a little bit about your term, knee jerk, rejection of the idea that these fires were intentionally set, and I've gone both ways on it and thinking about it. I think what we have is an environment in which the claim that a fire started with arson is now a political claim. That's right. And because it is a political claim, this isn't even knee jerk, suggesting uninvestigated as this is an automatic upsmanship Yes, nature's it's tribal. And the problem is, you can't run a society this way. You cannot have a disagreement over facts because the facts point in an inconvenient political direction. And of course, we've seen this many times we've seen it with climate change and other such things. And you know, very frequently, people like you and me who reason from first principles and try to do so, you know, soberly with a scientific background are often caught in between the two camps, right? You and I fall out in the anthropogenic climate change camp, but we're no fan of the models that are usually used to defend this position. Right. So and, you know, there's,

**Heather** 19:05

or the, you know, we're scientists trust us do what we say because we're wearing the right clothes and have the right degrees approach which is itself of course, you know, leading by authority, which is just a step away from authoritarian approach, which is anti scientific,

**Bret** 19:22

right. And so at some level, the, we are staring at the collapse of civilization from no cause greater, you don't need anything more than the simple agreement to take the facts and capture them for your side. That's sufficient, because that will collapse. Medicine, it will, it will cause economics to fall apart or to serve one side at the expense of another that you cannot have a situation in which we can't at least agree on what took place before we get around to arguing what to make of it and the idea that we are living in a state In which fires are raging out of control, health is severely compromised. And there is any possibility that we would even have to worry that we were being protected from the inflammation that fires were the result of arson is already evidence that we are in a, just a dire scenario. Yeah, that's right. Even if they're not arson, we want to know that that that idea has been fully vetted before it's been rejected. And we know that in some cases, it's unambiguous. Right? We can see on Twitter evidence of fireworks associated with certain fires, where citizens put them out. So yeah, man, how did we end up here?

**Heather** 20:42

Now? Yeah, that's some of what we're trying to talk about and figure out isn't it but let's let's pivot if we can, because there's a lot of stuff not related to what we talked about in the last episode that we want to talk about. But I did want to spend a moment returning to this this cuties film, which we watched the night before last livestream. And we talked about it and we are not fans. Afterwards, I watched a excellent many viewers will be familiar with it an excellent six minute, so I can just show the super, super briefly and then take it off. Let's take it back to Vienna, you weren't quite there. So this is you can take it off now so that I can talk again. six minute video interview with the writer, director of cuties, Mona duker, I think is how she was pronouncing her name. And it's really exquisite. Like she she compels me that as you were arguing in our discussion of the film, that the message is not for the message that she was trying to convey is not that this hyper sexualizing of preteen girls, is an apt response to the disempowerment and de sexualization of traditional Islamic household. That is not an honorable thing she finds she finds problems in both approaches. And you know, as I said, then it's it's no more empowering of women to do what is being depicted in this film than to have to hide under a under a burqa your entire adult life. But so I was compelled by her. She's She's a, you know, clearly a extremely smart, beautiful woman with who who's pulling a lot of what she's talking about in this film, from what she's seeing her own life. And she interviewed a lot of preteen girls, herself, in Paris, immigrants from Senegal. And so you know, that all suggests that this, this work had a lot of work behind it, this art had a lot of work behind it, but but she doesn't achieve what she tried to do. And the ends don't justify the means. So I wanted to say, you know, I recommend watching her six minute video interview. While I don't recommend watching the film. And it reminded me, I've seen people defending the film, I've seen a lot of people rejecting the film on social media, and I suspect that they haven't seen it. I've similarly seen a lot of people defending the film on social media, and I sort of suspect that many of them haven't seen it. And I suspect actually, if you'd seen the six minute video, as opposed to the clip of the girls twerking. And that was all you would seen, you would find it very easy to get slotted into one of these positions or the other. And that frankly, the sort of intelligentsia on the left is much more likely to be compelled by this, you know, beautiful and eloquent and smart filmmaker, speaking for six minutes about her intentions than other people might be. So I was reminded of actually just my first first two years in college when I was a literature major before I ran away precisely because of the kinds of conversations that were happening, that they were that there was just no way to assess the validity of the narratives that were being put forward to explain what we were reading and these clearly fictional narratives. So the discussion has sort of been back in the late 80s surrounded around whether or not we should assess art on its own, or if we needed to include an awareness and analysis of the Creator and his or her intentions in the art. And broadly speaking, this is sort of a brand of theory called historical biographical criticism. And it is a critical method that and here I'm quoting Wikipedia, the excellent source, that that historical biographical criticism is a critical method that sees a literary work chiefly, if not exclusively, as a reflection of its author's Life and Times. That is, you cannot be expected to actually take the art and assess the art on its own. You have to wrap it up in all of its context. And to that, I would say, I'm often Most people are often interested in the backstory of the creator of a piece of work, or to read an artist statement if it's available, right? But it shouldn't, and it can't be critical to interpreting the art, the art must stand on its own. And the idea that, especially when we have a piece of art that is actually

**Heather** 25:20

that looks like this, the idea that you have to include the intentions of the Creator in your assessment of whether or not it's, it's an honorable thing to be out there, I think is exactly wrong. So I've seen argued that there was no intention that this was sexually exploitative. And therefore it's not right. And I don't buy that now, I don't know they're calling this porn, so we don't have to go there. But we, we did. And we are calling it sexual sexual exploitation of preteen girls, both of the actresses and potentially leading to more of the same by people watching it. And the fact that the intention might have been, in fact, the opposite by the Creator doesn't actually change the fact of the art itself.

**Bret** 26:09

Well, I'm not 100% convinced that the background of the maker can never be required for the art to be interpreted. So I'm just imagining that there's certain things, there's certain things that require standing. In other words, if a Holocaust survivor wants to make a piece, in which they humanize a guard in a concentration camp, that's very different than if some person with no connection decides to do it. And so I'm not saying that the art shouldn't be able to stand on its own. But I'm saying that in that case, the context might allow me to engage the art openly,

**Heather** 26:55

it might, it might allow a window into it, it might allow you to approach it in a way that you would not otherwise choose to approach it. And I think that's, that sounds completely valid to me. I guess, in this case, I worry that this will do that job. Oh, right, that this, you know, the, you know, we did watch it, we did not speak publicly about it before we had actually seen the film. And, you know, in many ways, it was, you know, beautifully done, but, but the girls are heavily sexualized. And, you know, if, even if it's only those four child actors, right, even if that's the only effect, it's it's too much, it's too much. And you know, your point last last episode was, if this were a book, that would be a different situation, right?

**Bret** 27:40

Because you could explore something without anybody being hurt. Yeah, right. Now, in this case, I think if we're, you know, now that we know that, you know, based on your viewing of this six minute piece, that my interpretation of that last scene, which is too brief, to make its point is actually the right one, that's actually she's judging both these things, both the overly restrictive, you know, Muslim upbringing, and the overly liberated, which isn't even the right word, but sexualized Western alternatives. He's judging both of them, which I actually think is a very important point. But what happened here is a perfectly predictable Western tragedy, which is that this person who has standing, sees a problem delivers a film, and it is two things happen one, it is co opted by a very Western entity, Netflix, right, which sees this as a much as a very saleable property precisely for the you know, it invalidates half of the filmmakers point, in order to sell this thing this is this is a small art, it's

**Heather** 28:51

not that Netflix distributing it was was a failed, that was potentially a huge win, but allowing them to do the marketing, once they had signed on to the distributing clearly did indicate exactly the failure, you're talking,

**Bret** 29:02

right. And frankly, I think the only reason that Netflix gives a shit about this film, which they clearly did was that they could use it for an ironic purpose, which was to capture an awful lot of attention, either because of the controversy, or because they had these sexualized girls, you know, and that that should sell even though it shouldn't sell right. So Netflix, what it did is despicable. It creates a lens through which most people arrive at the film, which will cause them to get the wrong message out of it, which we'll call it, you know, so it distorts the film. And the other thing which I think is even more frightening is that because we live in a culture that is constantly pushing useful features female sexuality to sell everything, right because that's the lens that is being imposed on society by marketers and presumably People who sell porn, right? That lens means that this film which is supposed to repulse you, with the sexualization of these young girls doesn't work that way for the whole audience, there's some fraction of the audience that finds it positive, and therefore it gets entirely the wrong message from the film. So, you know, that it's, it's an incredibly revealing phenomenon that this film has created meaning, you know, in addition to the phenomenon that you point out, which is that anyone and everyone considers themselves an expert on this film, whether or not they've seen anything beyond the poster, right? So yeah, this one way or the other, this film seems to reveal a tremendous number of failings in our system. And you know, what to do about it as a question, but obviously, the market didn't solve problems here. The market created many problems.

**Heather** 30:57

Yes, yes. All right, well, lots of other places to go. We could we could rip the New York Times to shreds.

**Bret** 31:06

Oh, my God, you mean physically? Or I didn't bring it? No, no. All right, have

**Heather** 31:11

to be with words.

**Bret** 31:11

Let's do it. Metaphorically.

**Heather** 31:13

You want to start there? Why not? Okay, so let's see if I can pull this up. Hold on, where did it go? Okay, Zack, would you show this, this is from this is from the Sunday, this last Sunday's New York Times the front page, very front page. September 30 2020, has this graphic for those of you who are listening, not watching. Biden's days ahead, Joe Biden is leading among likely voters and for swing states, including one Donald Trump narrowly won in 2016. And it would appear to be a simple graphic, it would appear to be deeply quantitative, wouldn't it just like looks like numbers, and therefore you can trust them? Because once it's numbers, once has been counted, it's got the stamp of authority on it. So what we have is the results of a poll from September 2020. And in four states, with Biden leading in all of them, and we are the New York Times is comparing that to the results from 2016. In which, in which, well, it doesn't even matter in which Sorry, I got distracted there looking at these, these numbers as one does. That is not the comparison that this calls for. In what world does it make sense, actually, to compare the results of a poll in September 2020, to the actual election results following the 2016 election? What I want to see what what actually have been worth noting and looking at and considering is the results of a September 2020 poll compared to the results of a September 2016 poll. If you want to also include the 2016 results, okay. And then you can also compare those not just to what people are thinking right now, but to help people either change their minds in two months in 2016, or lied to the pollsters, because we know there was a lot of that the polls one way or another were really, really inaccurate in 2016. So we are being asked to compare a poll, why do we think those are less accurate, those are more accurate. Now. I think if anything, they're less accurate. We're being asked to compare the results of a poll to actual election results, and not being given the actual item that we should be comparing to this is this is a kind of a numeracy and it's hard to name because it's like it's like a category error that this is and I fear action. I know for sure that there are many practicing scientists out there who don't understand statistics well enough to understand what things need to be compared when they're actually employing even basic statistical tests. And therefore you can't trust their results because they haven't compared the right things. Sorry, I'll stop you're looking at is she ever going to stop that you're

**Bret** 34:03

not going to use the the obvious fruit analogy fruit? Yes, they've compared apples to oranges. You're supposed to say that. And I'm supposed to push back and say no, they've compared apples to apples, but in the sense of having compared a granny smith to an iPhone 10 Yeah,

**Heather** 34:21

there's a reason I don't say they've compared apples to oranges in front of you. Because you know, always do

**Bret** 34:26

that's what they do that sort of thing. Yes. Now, this is absurd. This is this is the New York Times engaged in the construction of fictional narrative. Using pseudo quantification by comparing two things that are not in and of themselves comparable. They have created the impression of a story that is going to unfold. In other words, Biden is going to beat Trump because if we look at the, you know, the past example, it tells us that we're actually ahead of where we would have been And I'm speaking from their perspective, but that were ahead of where we would have been in 2016, which is not the case. Right?

**Heather** 35:07

So I don't actually know I mean, I assume that you know, we quote unquote, are not, you know, of course, what we hear is the New York Times speaking for the Democrats, because the new york times is, has just stopped pretending that it's anything but you know, the voice of the DNC over in political space. But, you know, if I had to guess, my guess is that those numbers would look kind of similar for Clinton for 2016 poll, as they do for Biden for September 2020. poll, if I had to guess not that I have access to those data, because the New York Times decided to show something that is not actually comparable.

**Bret** 35:41

So I want to confess something, do it. I am not innumerate. But I looked at this. And the first pass at this chart succeeded in misleading. I believed that they were making an apples to apples comparison, the proper apples to apples comparison. And

**Heather** 36:00

you see, you've done it to yourself. Yeah, apples to apples,

**Bret** 36:04

I have done it to myself, which is only it's only fair. Yeah. But you're, you're correct. I was tricked out because I was only dedicating part of my mind to looking at this and just trying to extract the data, which is, you know, look, if you have a newspaper that honestly reports, there's something to be said for the ability to quickly look at a presentation a chart or something and derive meaning from it. And the problem is now we're in the situation where it's like, you have to, you know, consider the source and what kind of scrutiny you and skepticism you have to deploy in order to correct for the biases, and it's just not workable.

**Heather** 36:40

No, no, it's not. So that's, that's kind of all i have on that. Yeah, it wasn't even embedded in the story, it was just a little, a little graphic that purports to tell you something that actually doesn't tell you. Well, I

**Bret** 36:54

would add one thing here, not so much about the publication or this particular duplicitous graph or chart. But the fact is, if you increasingly we've been asked about how to deal with the vagaries of the moment, and one of the things that is absolutely high, maybe top of the list, is that you have to tune into sources that you're not supposed to be looking at, right, so that you can correct for the biases of each one. This is a very important skill under the best of circumstances. And we're not in the best of circumstances, we're in circumstances where you can't even reconcile perspectives from different sources. But the where was I headed? Damn, I have lost my train of thought. Has anyone seen my train of thought?

**Heather** 37:46

That is unlike you to? That is, I suspect that is smoke talking and not anything you've inhaled intentionally for fun?

**Bret** 37:53

Nothing that I have inhaled intentionally. We were talking about the new york times the correcting for the biases. And I don't have it, it'll be back in a minute. All right, swear it.

**Heather** 38:07

Well, we this this might be a place to go next Scientific American, has for the first time in their 175 year history endorsed a presidential candidate. And of course, they've endorsed Joe Biden, and they say, you know what, they've changed their headline, I believe, I thought that it had said that this was a life or death moment. But I'm not seeing that here now. So either I imagined that or they have in fact changed their headline sometime over the last several hours, which is quite possible

**Bret** 38:40

hazard of doing this from a live web page. Yeah,

**Heather** 38:43

that's right. I didn't I didn't screenshot it. Here we go. So they say a bunch of things about Trump, some of which I think are true. The most devastating example is this dishonest, inept response to the covid 19 pandemic, which cost more than 190,000 Americans their lives by the middle of September. I certainly inept and I think, probably dishonest in many ways as well. I think it was the low point of his of his presidency, in in many, many regards. Scientific American says he meaning Trump also has also attacked environmental protections, medical care, and the researchers and public science agencies that help this country prepare for its greatest challenges. Yep. I mean, he's, you know, he's, he's out there with his with his sword sort of slashing and whoever irritates him in the moment. I'm sure that's happened in all those cases. That is why Scientific American continues. We urge you to vote for Joe Biden, who is offering fact based plans to protect our health, our economy and the environment. These other proposals he has put forth can set the country back on course for a safer, more prosperous and Wakeford more equitable future. Equity, equity, there it is rearing its ugly little head. Yeah, yeah. I also question that Biden has put forth any proposals recently? Well,

**Bret** 40:02

I agree he's not running on anything positive. There's also

**Heather** 40:06

no I just don't think that he's, he's not running. He's not he's not the one leading, I

**Bret** 40:11

would agree. He's also played games with all of these claims about racial injustice and all these things, which are, for whatever reason, very difficult to demonstrate scientifically. And so this is not a simple puzzle of one of these parties being the proper defender of science or anything like it, right. I did recover my train of thought, if I knew I would, by the way, I have a little trick for how you do that, which is why I don't tend to get too lost on these things.

**Heather** 40:41

You're going to say the thing and then you can give us the trick. Yeah, yeah.

**Bret** 40:44

So the thing was that I am hearing from the different places that I am tuned in, some of which are places that I find simpatico and other places are ones that I find frightening in one way or another. But I am hearing totally divergent narratives about where we are in terms of who's ahead how far ahead and with the presidential race in particular coming. Yes. In other words, I think especially if I listen to democrat space, there is an all out push to sell the idea that Biden is clobbering Trump, by the numbers. Now mind you, that was exactly what we heard in 2016. It

**Heather** 41:31

couldn't be more similar, actually. And it's, it's amazing. I know you're going someplace and we don't want to lose this again. But I bought it in 2016. Yep. I and many, many, many people were shocked when we woke up the day after the election, could not believe it, like really thought it was an impossibility. Yeah, I bought it in spite of myself. Right? Yeah. I mean, yes, it's in spite of some of us, it was in spite of ourselves. But I really believe it to be true. They're saying exactly the same stuff. Well, and then they're putting things like this graphic near times in which they're making false comparisons and acting like that the right ones? Well, why? Why do we think this is any different?

**Bret** 42:11

Right? And I mean, the thing is, we know, in retrospect, what the problem was in 2016, which was that there was noise in the data that came from people not being honest with those who were taking the polls. So what you would want if you were going to do the analysis and say, Oh, this time the democrats really are Ed, you would want to know why this circumstance was less prone to that noise.

**Heather** 42:35

I have it. The reason that the polls this time are more reliable than last time, is that the culture of fear there's predominating in the country in 2016, has disappeared. There's no we no longer have any of that we have achieved the inclusive and equitable society that the people on the fringe left have been fighting for in the streets with riots, almost nightly since the end of May. And because of that, we have arrived at a fully peaceful unicorn filled and rainbow filled utopia

**Bret** 43:04

right. Now. I think that's right. No, I think you've nailed it. Let's put it this way. We have an added factor on the table. Right? And I just people are going to take this the wrong way. There. I am not going to vote for Donald Trump. I'm not gonna do it. But I want people to notice what situation we're in here in Portland. Right? We have nightly riots, I have to confess I don't know what's going on. While we've had this thick smoke. I think it's been reduced the meaning of it? I don't know. But we have something like 100 consecutive nights of protests that were all or almost all followed by violent riots later in the evening. Yes, right. We have a state civil authority in the city of Portland, that does not enforce the law and is constantly broadcasting a message to those who are breaking the law, that they will not be treated in a serious fashion right there. They are being handled with kid gloves. The governor of the state will not step in, in the absence of, you know, in the face of the the mayor's dereliction of duty, right? That leaves the federal government as the only line of defense that citizens of the City of Portland have against a violent roving, right? Right. That is an argument for voting for Donald Trump now

**Heather** 44:28

because the democratically elected and the democratically elected Democrats in the state and the city refuse to do their job right or not. And you know this this is a little bit weird to be talking about now because we're now over a week into a completely different situation with the fires and the smoke. And so you know, things have changed and whether or not the writers will have gotten out of the habit of writing. When the smoke clears. I don't know although I doubt it. I think they will come back to it. But it? What are we supposed to do? Like we're supposed to continue to support a total lack of leadership, which is potentially putting many or all of us at actual risk? Well, this is this, this is a sane move.

**Bret** 45:15

Let me just say, I won't vote for Biden, and I won't vote for Trump. Yeah, okay. I'm not going to vote for either one of them. But I do want those who are so confident that this time we're finally on the right track electoral rally those democrats who are who are beating that drum, they are missing the fact that they are placing people like citizens of Portland in a position where there is a rational argument for voting for Trump, where I don't think that argument existed in 2016.

**Heather** 45:45

That's right. Even more people will not say to their friends and family, and certainly not to pollsters. You know, what, this time I'm doing it? Yeah, they will, they will lie to protect, to protect the peace within their own spheres. And we know that was happening last time. And it's I just, anecdotally, we have seen, we've heard from so many people. And we see the situation that you that you have just laid out on the ground here. And in many other places, where cities which tend to vote blue, which tend to vote Democrat, there got to be a lot of citizens and a lot of places going, I'm not sure what my choices here. Yeah. How about the leadership, the locally elected leadership actually step up and do their job. So I'm not forced to do something that I don't want to do, you know.

**Bret** 46:31

So it's a it's a very interesting predicament. And it does put the lie to these, these data, which seem to suggest one thing or another, because at some level, people have more reason, there's more of a reason for there to be noise in the data that is born of people being dishonest about what they're actually planning to do.

**Heather** 46:51

I don't even I don't I'm not sure that's noise. I think it's hidden, hidden pattern that goes the opposite way that the polls are saying.

**Bret** 47:00

Yeah, I agree. It's it's systematic bias. Yeah. Okay. So what's the trick for getting back to your train of thought, Oh, man, oh, I fear saying this out loud. Because once you publicly have a trick for getting back to your train of thought, when you lose your train of thought, and the trick doesn't work, people are gonna think something's up. But the trick is, you put yourself you can very frequently recover the feeling that you had, as you were thinking, the thought, like the emotional feeling, absolutely. Ah, and then you find that emotion again, you put yourself back in that emotional mindset. And very frequently, it sort of edits down the range of things that you might have been thinking, and you know, you sort through six or seven thoughts, and there it is. So good.

**Heather** 47:43

It's like it's an analogy. It's it's emotion dependent memory. analogized, I would say to state dependent learning, that is

**Bret** 47:51

exactly what it is. And it's actually, you know, I've talked about state dependent learning having important relationship to music and emotion. And this is, this is where that thought came from is these things are coded. There's basically a Dewey Decimal System of, you know, there's an emotional catalog, so that you're not constantly searching the sum total of all the things you might say or think you're only searching the relevant part. So

**Heather** 48:17

maybe, maybe you don't want to go here. But I guess I'm surprised that you can find enough nuance in your emotional state from one moment to another, especially when we're live streaming here that you can identify, oh, this was like, it was like two minutes ago, I know what I was feeling then, as opposed to the minute either side of it. Like, that's, that's the level of specificity that I would, I don't know how I would accomplish that.

**Bret** 48:39

I cannot say how easy it will be for others, it's possible that this is really easy for everyone, once you realize to try it. It's possible that it's one of these things, you know, like, you know, you know, I'm weirdly good at spotting a particular voice and placing it. Yeah, if some, if some voices used in a commercial, I can very often figure out who,

**Heather** 49:00

you know who people are by their voices very well.

**Bret** 49:04

So it might be one of those, you know, weird skills. I sort of suspect it's not, for some reason, I think probably because the emotion is sort of a bigger category, right? There's some general emotion that you have towards some specific story. And so that emotion, holds all of the things that you think in its context, and it is therefore slower to dissipate. Because as you lose the particular thread, you're still in the same landscape. So you can very often if you realize you've lost your train of thought you can find well how do I feel? I don't know why I feel that way. Because I don't know what I was thinking. But I still do feel that way. And then you can sort of put yourself back there.

**Heather** 49:42

And I guess, maybe another thing that's surprising me to me about this thing is that you don't just feel like Oh shit, I forgot I was thinking, like, why? How is it that you can find anything through the like, low grade but something of a panic response like it's gone?

**Bret** 49:59

Well actually, you know, It's fine. There's an analogy for this. And it connects a little bit to my conversation that I had with Greg gutfeld on his podcast, where he talked about our podcast. So this is now totally tangled. But we were talking about lucid dreams. And one of the things about lucid dreams which I learned through some stuff that the Stanford Research, the sleep Research Center had put out on lucid dreams. Yeah, was that the problem many people have the beginnings of lucid dreams. But the problem is that the discovery that you're dreaming is so jarring that it wakes you right up,

**Heather** 50:29

right? And you have to like not not look at it right, you have to

**Bret** 50:33

calm yourself that you have to calm yourself to the discovery that you're dreaming so you don't startle yourself awake and that's sort of how you get through it and this is the same thing you have to not panic over the fact that you have lost your train of thought admittedly harder when you're streaming to a live audience but nonetheless you have to not panic over it and actually as you get better at it you develop confidence that you can get back to your thought if you work at it. Which also makes you calm

**Heather** 51:00

right so the more you do it, the better you get. Yep,

**Bret** 51:04

there's a positive feedback practice element yeah

**Heather** 51:07

Excellent. Well let's see. I definitely do want to talk about this snake at some point I don't know if you want to speak about this this paper that we were looking

**Bret** 51:23

at already that speak about this paper so actually there there are two

**Heather** 51:26

things so I don't know if you want to go to the Zero Hedge article or Yeah, you might as well let's get

**Bret** 51:30

ourselves in trouble with all of the people who consider Zero Hedge problematic okay. Alright, so here we have zero hedges report on this preprint that emerged

**Heather** 51:47

I'm not sure it even counts as a preprint right?

**Bret** 51:50

Oh, it's because it's not on a preprint server Yeah, yeah, it's so what is this document and I must tell you one thing also share the document Yeah, you want to show the document I sent you a PDF.

**Heather** 51:59

I've got it here. Hold on. Just

**Bret** 52:08

maybe Yeah, we do down here. Yeah. So you need to scroll up out here. Yeah.

**Heather** 52:15

That's not gonna be hold on sec. So Brett, you for people listening?

**Bret** 52:24

Yeah. So for people listening, what we've got is a paper here the title of the paper is unusual features of the SARS Cove to genome suggesting sophisticated laboratory modification rather than natural evolution and delineation of its probable synthetic route. Lead author is Yan now I must say, I don't know Yan. He's been in this landscape for months now. And the

**Heather** 52:50

Chinese horologist, who had been working and living in Hong Kong who left Hong Kong without the authorities in her home country wanting her to presumably in April of this year, I think, right.

**Bret** 53:02

So I have trepidation about her work in part because it is traveling outside of the realms that might allow you to you know, as you point out, not a preprint, right, not a preprint server. Now, I'm not sure why I'm more troubled by a paper put out outside of a preprint server given that the preprint servers have requirements about credentials, and that that can be used to bar certain things. But nonetheless,

**Heather** 53:27

I mean, the fact is that the regardless of who's in premature is on this with regard to the organization, that is that is named here we've got what is it for, for PhDs who've written a paper that is very well researched, I see if you can just put that download so I can read the screen here. Here we go. Just second paragraph of the introduction, as a Coronavirus, SARS Cove to differ significantly from other respiratory and zoonotic viruses, it attacks multiple organs. It is capable of undergoing a long period of asymptomatic infection. It is highly transmissible and significantly lethal and high risk populations is well adapted to humans to the very start of its emergence and is highly efficient and biting the human Ace to receptor the affinity of which is greater than that associated with the ACE to have any other potential host. And it goes on and on and on. So a, this fits with a number of things that we talked about early in our live streams and that you talked about with Yuri Deegan dig and taegan in the podcast that you did with him, and you know, they've just they also a big part of their argument here is that there has been active censorship by the scientific community and by the journals, presumably, at least potentially also, therefore, by the preprint servers themselves against publishing anything that suggests a lab origin for the virus, right? And you know, and we we did this for like 18 episodes running back and our first 18 or so episodes, but, um, you know, lab origin is not the same thing as bioweapon. We're talking about to say lab origin does not specify whether or not you're talking about an inadvertent escape on one end to an intentional release of an intentional bio weapon on the other or anything in between. And you know, really most of these analyses are imagining at some sort of like, Oh, my God, this is being developed. And it escaped, no one ever meant it to. But really nothing about how it got out into the world is part of the analysis around does it or doesn't does it not have a lab origin? I guess the other thing is, as people who've been watching for a long time will understand that lab origin doesn't mean created from scratch in the lab. That means, you know, borrowed from other viruses, and made into a camera slash engineered

**Bret** 55:48

Fire Mirror parts. That's one of the things that means I'm positive, yes, from natural sources. But the other thing that it means, which has very ominous implications here is what's called serial passage experiments basically use selection in the lab artificial selection, to imbue viruses with capacities that they wouldn't otherwise have. And so, again, I don't know what to make of this paper, though, it looks to be very well researched. But the paper is putting together some of the things that we did talk about early on about how much of the frightening part of this virus, you know, its diversity of organs that it attacks, right? Its ability to transmit between human beings. How many of these features are actually the result of a guided evolutionary process in a lab coupled with a compositing, which could be of totally honorable origin. In other words, people who wish to study a virus that was dangerous to humans may have created a virus that was unusually dangerous to humans, and then it got out through an accident. So that's the most likely scenario as far as I'm concerned. And we are now beginning to see analyses that strongly reflect this. So at a different level, Zack, I would ask you to put up the the aleena Tran article from Boston from the

**Bret** 57:19

Okay, here it is. Right? So here, what we have is a profile of somebody I've been following online, since boy, I don't know, March, something like that. Alina Chan, who is a young researcher, a problem solver, who became suspicious of the origin story of SARS Cove to on the basis of many things primary among them is something else you will have heard us discuss here many times, which is the fact that this virus hit the ground running and was already extremely well adapted to infect human beings rather than

**Heather** 58:04

that's in that list that I read from here in this in this paper,

**Bret** 58:07

right. And so in any case, this article is written for a lay audience. It's very accessible, I highly recommend it. And it does a number of things. One it tells told me a lot of things I didn't know about Dr. Chan, one of them that I'm particularly intrigued by is that her story as a scientist is not a typical one of her having been a brilliant student and this and that she is somebody who didn't love school always bridled against its its constraints. And has, in spite of those things emerged as a, a brilliant neurologist who has spotted all the things that were wrong about the story of SARS Cove to and investigated them and has established many of these claims on a very rigorous basis falsified, for example, the claim about pangolins and the source of the spike protein. So anyway, I would just recommend this article to people we will post a link to it. But I don't know maybe maybe Dr. Chen will come on the Dark Horse podcast at some point because she seems like a true Dark Horse.

**Heather** 59:19

That'd be great. Yep. All right. It's nighttime.

**Bret** 59:23

Yes. Well it's always nighttime so I think

**Heather** 59:26

an hour Okay, we'll finish with snakes. How about that or one snake Really? So this is a report it's also from a New York Times I don't know maybe they got this one right. I can person can hope. A 62 year old ball python at the St. Louis zoo. Here we go. Zack, if you don't put that up 62 year old Python at the St. Louis zoo, who has not had access to a male for at least 15 years has laid seven eggs. And not only has she not had access to a male for at least 15 years. She's already a couple of decades past her cell by date, apparently, usually they don't live that long.

**Bret** 1:00:06

But these eggs are, at least some of them are alive.

**Heather** 1:00:11

There were seven of them. Two of them died. Two of them were, I think killed for research purposes. And three of them as of as of right now are still alive and have not there. Let's see, how do they end the article with they are not counting their snakes before they're hatched. So there's three that are still potentially going to hatch

**Bret** 1:00:33

killed. Now.

**Heather** 1:00:35

I know they I noticed it

**Bret** 1:00:37

with all of the scanning technology, it's hard for me to imagine that there was any justification of that.

**Heather** 1:00:42

And I could not actually positive that's what happened to the two of them, because it's, it's written for a lay audience. I couldn't quite tell. But I think I think that they, they basically collected the eggs for research purposes, and in so doing, killed, whatever embryos might have been developing inside. But there are three still out there. But this I mean, this just raises so many interesting questions, doesn't it? We have, for instance, such as let's just start with, okay. She hasn't seen a male in 15 years, Could she have stored sperm for that long? There are very long Sturm stem storage. And that's not that's not a thing. It's not a thing. Sperm storage. Things that organisms do. Usually it's not years and years and years, but it certainly is known

**Bret** 1:01:31

in the answer is an answer. Yeah.

**Heather** 1:01:34

I said it. Yeah. It's not it's not as common invertebrates. Yeah, I think, you know, the example that I think of with regard to storage. Actually, when there's just a whole lot of ways to get around the problem of you want to reproduce, but you're not sure you're going to be able to find a mate at the right moment. So like, woven. love to talk about that. Yeah, this is awkward. Yeah. Like Wolverines? I'm not sure Wolverines do sperm storage, or do they just do delayed implantation diapers or something? Yeah, so they actually they, they bring sperm and egg together. And then they have, they basically put, put that zygote into stasis throughout much of the fall and part of the winter while the Wolverines are in, basically, in sleep for the winter, and then they and then only at the point that the seasonality is looking right, does the zygote get implanted in the uterine lining and start to develop so that's, that's one way that reproduction can be delayed. But actual just storing of sperm to be used at some later point is, is common and ants and the I didn't like a lot of a lot of other species,

**Bret** 1:02:49

right? You know, a lot of mammals a lot of bats have a you know, and these periods of storage just allow you to break the connection between the mating period and the point at which offspring are born. And there are lots of different versions of it, where the, you know, the place where the pause happens in the reproductive cycle can be moved along to different spots.

**Heather** 1:03:10

No, and let me just because I want to talk about Wolverines for a moment more. The example there is that because they live in cold habitat, and basically need to hibernate in order to make it to the winter, you're not doing a lot of courtship while you're hibernating. It's

**Bret** 1:03:26

just I'm sorry, I'm about to reveal my ignorance. I thought. Because Wolverines specialize on large carcasses. I thought they weren't hibernating if I misunderstood Wolverine behavior.

**Heather** 1:03:40

Hmm. You know, I didn't I should have I should have looked up our former student dialysis work on this before I start talking about Wolverines. It's possible I've Miss remembered the hibernation thing, but I think, I think not. And precisely the argument for diapause is that they, they basically, they do their Meet and Greet, and courtship and sexual reproduction in the fall when they actually are going around sourcing food. And then once they're in their dens, and it's and the timing is right, such that a baby could be born as spring was happening. That's when implantation occurs. But we'll definitely correct that if if I'm wrong about that.

**Bret** 1:04:21

So if you're a Wolverine, and we've gotten this wrong, don't panic, we will fix the record so it correctly

**Heather** 1:04:30

regardless if you're watching, which I know you have been at some point in the past, definitely correct me if I've, if I've got it wrong, which I might be. Yeah. But okay, so sperm storage for over 15 years in a ball python where that's never been noticed before? Probably not possible, but probably not.

**Bret** 1:04:47

So I would say chances are very, very, very low because even if sperm storage were a thing there is it's hard to imagine an ecological circumstance that would require That duration of sperm storage therefore Yes, it's unlikely to work or Mizzou is

**Heather** 1:05:05

a novel environment for Ball Pythons. Yes, yes, very much so. So probably it's facultative parthenogenesis. That's a couple of words put together that sound like bio speed because they are but facultative being the CounterPoint obligate so if something is obligated always happens 100% of the time. So humans are obligately sexually reproducing. And this Bob, these Ball Pythons apparently are facultatively, usually sexually producing but facultatively parthenogenetic, meaning that they can probably self themselves probably not cloning. But it's possible but probably selfing. And let's go back to that, because I think we there's some fun stuff to talk about there. But another interesting thing is that all snakes have long been understood to have genetic sex determination that they have sex chromosomes, just as mammals do, although it's a separate evolution of sex chromosomes. And just like birds do, in fact, which is again, a separate evolution of sex chromosomes for mammals. birds have as ew system not an XY system. So in birds and mammals, everyone probably watching or listening to this will know this, but maybe not in these terms, that female mammals are xx x. And because the two x's are the same chromosome looking chromosome that's called homo comedic same gamete. And males who are x y mammals are hetero comedic different gametes that that in the case of humans 23rd chromosome position. And that's true for all mammals except the monotremes which are just weird and they've got like nine pairs of sex chromosomes and let's not talk about them at the moment. That's the duckbill platypus and the two wickedness. So they're bizarre but all of the, the marsupial's and the placental mammals lets us have this x y system. And birds have a different evolution of chromosomal sex determination which for just reasons of not confusing them is called the CW system in which it's the females who are hetero comedic. So females are z w. And the males are homo give me I can I actually don't remember i think i think it's Cz. I don't remember if we call them zz or WW, I just don't remember. And that that actually makes for some interesting predictions about behavior that we won't go into here, but are fascinating. And for a long time, it was thought that all snakes had like birds, but separately evolved a z w. chromosomal sex determination system. But a recent paper in 2017 finds that at least two lineages within the bones a Python and a bow are not the ball python, but a different species of Python, have an XY system and that the Python the bow are themselves independently evolved. So we've got all these different evolutions of sex chromosomes within snakes, at least three and probably more. Alright,

**Bret** 1:07:57

so am I correct in recalling that it is a Python? There's one snake lineage that has vestigial limbs? It's based

**Heather** 1:08:08

on the Bowens bow IDs. Okay. And so funds are bow IDs as bow as this

**Bret** 1:08:13

is weird. somewhere within the bow ID lineage. You have an x y system, revelations apparently, all right now this, this raises so many questions that we cannot trouble our dark horse audience with because they're not going to want to go into the weeds with us, but some of them do. Here's the question. Yeah. Which things switched And all the while

**Heather** 1:08:34

you talk Zack even just show this this so that people can look if they want to.

**Bret** 1:08:38

Discovery of x. So okay, I am now frustrated. Assuming they don't sort this out. I'm frustrated with our colleagues for having defined this as an XY system.

**Heather** 1:08:48

Oh, I agree. And calling calling what's happening all the rest of the sexes, dw says dw says no, it's wrong, because there's not the same

**Bret** 1:08:54

every separate evolution of this should have its own set of letters 100% talk about it. And you know, you can come up with a convention So you knew which was which, but but here's the question to pot. So if you have snakes embedded within the blood lineage, who have an XY system when the rest of snakes have a z w system, if this is a reversal, then the question is which thing reversed? Was it the sex did the sex flip? Yeah, that is to say the phenomenology of the sex did it change which critter it was appended to? Or did the chromosomal system switch or

**Heather** 1:09:41

and I think this is more likely given what we see if we if we sort of map sex determination systems on to all invertebrates are all of tetrapods which is the vertebrates that have come on to land that include the amphibians, reptiles, birds and mammals? You actually see quite clearly, that environmental sex determination is basil right? That You have systems and many people will be familiar with the idea that there are some turtles for instance, where if you if your egg develops hot utet, you end up female, if it develops cold, you end up male. And then there's some where intermediate ones or female, I can't remember, there. They're all all three of the possible systems are out there in terms of environmental sex determination, which almost always means temperature, sex determination. Yeah. That only works, of course, for organisms that lay eggs of the vaporous organism that had temperature sex determination, right is not going to work because the mother's body temperature can't can't be totally different for different sex Broons. That's just not how anatomy physiology works. If you did

**Bret** 1:10:39

it, you'd end up with birds that were all the same sex,

**Heather** 1:10:42

right? But then you'd have to, you know, unless, unless there was a whole part of the population that was at one temperature all the time and only produced female like it just it does, it doesn't quite track. But anyway, environmental sex determination is basil. And genexus determination seems to evolve multiple, multiple times, within the tetrapod lineage. And so more like more than more likely than some snakes going from a ZY to an x y system directly. They went back to not having sex chromosomes or not having them code for sex. Yeah, and then evolved or, you know, switch them while they weren't coding for sex into the opposite. The opposite thing,

**Bret** 1:11:21

which raises a really interesting question about what it is that causes an environmentally sex determined creature to go chromosomal, etc. But I think you don't want to get me started on that. No, I don't forgive me. I think you have buried the lede slightly with respect to our audience and what they're gonna

**Heather** 1:11:39

think facultative parthenogenesis There you go, right. That's, that's where we're going. Okay, okay, good. I mean, go Go for it. That's, that's that's the big thing. But I just didn't want to not talking about the other stuff.

**Bret** 1:11:49

Well, okay. So what I would want us to say is that this is a place where the failure of imagination amongst biologists the overgeneralization from our own circumstance, has, I believe, caused us to miss the boat. And we are now very predictably getting schooled by nature. On the following point, as far as we know, we don't have a mammalian example. except Jesus Christ, of parthenogenesis in a mammal, right, that that's still true parthenogenesis

**Heather** 1:12:23

being reproduction of a female with no input from a male,

**Bret** 1:12:27

right. So this seems weird to us that anything does this that any animal does this, or any vertebrate at least. But if you think about the puzzle of how creatures find new places to do their creature thing, how we get a species, you know, if you have one species of Python over here, and then you have a closely related species of Python over there that eat something different and behave slightly differently, but anyway, they're related, but they ended up into different places, what happened? Well, in general, a creature will have gotten lost or, you know, I don't know, some predatory bird can pick up a Python and accidentally drop it as it was carrying it to its nest in some new place. And this will happen a lot. And in general, the animal that's dropped won't be able to reproduce, because there's only one of them. And in the absence of a mate, it will maybe get by, maybe not, but it will die, it will be the end of its lineage. If it is capable of reproducing, then it could be an evolutionary winner of like an unimaginably great type, which is the founder of a new population. So the question is, is there a contingency plan built into creatures for those circumstances in which they find themselves in a habitat, that's great, but for the absence of a mate, now, if you're a mammal, you might get blown off course for your bat, you might get blown off course pregnant, and you might find yourself someplace with a couple of offspring, and maybe they're the right sex to reproduce. And, you know, yes, that's incest. But nonetheless, it might still result in the birth of a new population. But even easier, if you physiologically are built for it is the production of offspring that would be triggered by extreme loneliness, right, that the loneliness of a creature would be an indication that there's nobody else with the right kind around. And at some point, loneliness would be sufficient to trigger the production of either clonal or self fertilized eggs, which could then pending various questions like Do they have the right chromosomal complement that you get multiple sexes out of the brood that could then found a new population? That should have happened many times, but the problem is, if you don't expect it, because you're not doing the evolutionary theory very well. Then you don't notice the fact that this is probably happening with some regularity, even in your zoos, you have to pay very close attention in order to know that animal has not had access to Another animal that's kind of closely related species with which it might hybridize. Right? You have to know that really well. And frankly, how many times has some zookeeper who does know it really well said to the higher ups at the zoo. I don't know where these eggs came from. But that animal hasn't had a mate. And the higher up at the zoo is, you must have messed up whatever, right? Yeah. So now we are in this era where we are discovering that lots of creatures, it turns out, produce offspring without reproducing when we isolate them, which undoubtedly is revealing that this is a very common evolutionary mechanism. Now

**Heather** 1:15:34

we've got several examples now from the squadmates. Some some snakes, some Komodo dragons,

**Bret** 1:15:40

yep. And we've got sharks. You've seen it in sharks. Yep. Birds, have you seen a bird yet? Not yet. Now?

**Heather** 1:15:49

I don't I? I don't think that's going to happen. I

**Bret** 1:15:53

don't think it's going to happen. Yeah,

**Heather** 1:15:55

I don't I think mammals and birds are not going to, it's not going to have happened, and not that it's not going to start to happen. But I think I don't think we're missing that. Why, let's see, mammals and birds are not each other's closest relatives. Their most recent common ancestor is the same as their ancestor with this Python. Which was a long time ago at the origin of tetrapod Oh, no, it wasn't at the origin of tetrapods. But it was a long time ago, the origin of reptiles. some combination of their Indo thermae and their high heart rate, the convergence of cardiac anatomy and endo thermae, and brand size and I can't quite put it all together. But I actually I just don't think that mammals or birds are going to end up with faculty to parthenogenesis. And I want to think more on exactly why Yeah, I don't think so

**Bret** 1:16:54

I don't see the obstacle though. The fact that we haven't seen it in either of these two clades yet, suggests you may be right for reasons like I can't figure out I would say more likely in birds, though, because of the CW system, right? Because a bird female, you need to have an egg laying creature in order to pull this off, right, a male mammal can't produce pathogenic offspring. So a female has to do it in a female mammal, at least a marsupial or a placental would produce female offspring because she doesn't have a Y chromosome to throw at the problem. If she produces female offspring, then you get a line of females, which is not necessarily capable of switching back into a sexual mode. On the other hand, a bird with z w could produce a brood of eggs if she self rather than cloned, she could produce a brood of eggs that was partially female and partially male. And there's the distinction

**Heather** 1:17:51

of being there are many, many mechanisms by which you can get there. But selfing is basically putting two of your own gametes together to produce zygote as opposed to cloning. And so with cell phone, you end up with a reduction in the in genetic diversity, genetic diversity. Yeah, that sounds like the right word. But you end up with more homogeneity, across low low sigh with selfing. But you could get a z gamete and a W gamete coming together or z gamma z gammy coming together, even if you yourself are z w. Whereas if you're only xx you keyboard, where do you get the wide gamut, so you wouldn't be able to produce a male. One less thing to your point about, you know, the Komodo dragon that has swum across to a new island and found itself unable to get back because of currents and ease she is all alone is that this strategy of, of using extreme loneliness to prompt a reproductive event only works for half of the organisms Of course, right. And males, no matter how lonely cannot end up solving or cloning their way into, into reproducing. And this seems like you know, maybe I'm just being mean, or maybe this is a small point. But this is actually the fundamental thing. That is why I and many others are just so adamant about you know what male is real and female is real and no amount of pretending is going to make it any different because it is about the gametes. And female is to have a large ancestral gamete and mail is to have a small and motile gamete. And what makes that gamete large in the case of a female and that gamma being an egg, it's all the cytoplasm it's all the cellular machinery of life that is necessary to actually make a cell and so you put two sperm together yours you're just gonna get something Zippy that can't actually persist for very long can't and can't divide and grow. It just doesn't have the mitochondria and the the ribosomes, it doesn't have all the stuff it needs. So half of Half of your supremely lonely squamate say snakes and lizards that end up alone on an island are still out of luck. And half of them if they're male, and half of them with their female may actually be able to to turn that into a reproductive win.

**Bret** 1:20:18

So your your biological essentialism on this point is liable to get you accused of being a transphobic. And I should say it's happened before I will stand by you because I am not transphobic I am trans activist phobic increasingly, yeah. watching how they have treated JK Rowling and others. But in any case, yeah. Is there more to say about No. Nemesis?

**Heather** 1:20:43

I mean, yes, I obviously I could go on forever, but I should stop. All

**Bret** 1:20:47

right. Yes, maybe we've reached that point. Okay, so we will return in 15 minutes to do our q&a. Sir, anything we should say here,

**Heather** 1:20:57

consider joining us on our Patreon. either of them you can get access to the discord server on mine, you can also get access to our once a month private live q&a that we do on the last Sunday of the month. And you also have access to the past ones that are really up and the Crips channel also has clips from past episodes. And anything else?

**Bret** 1:21:22

I know there is. You know, like, subscribe, comment, circulate.

**Heather** 1:21:29

So we'll be answering your super chat questions in the next hour.

**Bret** 1:21:33

All right. Be well