**Episode #15**

**Speaker 1** [00:00:01] Welcome to the Cabrera Lab podcast. Hey. Hello.

**Speaker 2** [00:00:06] What's up?

**Speaker 1** [00:00:07] How are you?

**Speaker 2** [00:00:08] I'm amazing, how are you?

**Speaker 1** [00:00:10] I am fantastic.

**Speaker 2** [00:00:12] I am really, really pumped and excited for today. because one of our very favorite holidays is this week.

**Speaker 3** [00:00:21] What's that?

**Speaker 2** [00:00:22] Do you know what I'm talking about?

**Speaker 3** [00:00:23] July 4th.

**Speaker 2** [00:00:24] July 4th. Yes. Yes. July 4.

**Speaker 1** [00:00:27] about hot dogs.

**Speaker 2** [00:00:28] We're not talking about hot dogs only. We're going to talk about July 4th, why it's such an important holiday, what makes America the greatest country in the world, why the Constitution... Like democracy. Democracy, why the constitution is possibly the most brilliant document ever written.

**Speaker 1** [00:00:45] Wow!

**Speaker 2** [00:00:45] Not that I'm biased, but I am.

**Speaker 1** [00:00:47] Pretty badass.

**Speaker 2** [00:00:48] And, you know, just talk a little bit about it because I think people get lost in hot dogs and potato salad and the flag as a decoration rather than the symbolic meaning of it and all of those things. Yeah. I think we should talk about July 4th.

**Speaker 3** [00:01:02] Holy moly.

**Speaker 2** [00:01:03] and all the things that are, all the mental models that are associated with July 4th. Alright. Let's start with one of the fun ones, the Constitution, and why the Constitution is quite possibly the most brilliant document, evolving document, ever written, and what we've talked about with our kids and our students about it.

**Speaker 1** [00:01:29] So, I approach the Constitution probably differently than I think many people do. I mean, I'm not a constitutional scholar, so there are people on the planet that know much more about the Constitution, legal scholars and constitutional scholars that know a lot more about intricacies of the Constitution than I do. but I do approach it as a complexity scientist. And I think that it has really interesting. that the perspective of complexity on the Constitution, for me, is the scientific explanation of why the Constitution is so remarkable.

**Speaker 2** [00:02:18] See, now that is amazing. The scientific explanation of why the Constitution.

**Speaker 1** [00:02:23] So, in complexity science, the first thing, I think we've got to start at the beginning, which isn't going to be really talking about the Constitution or democracy or anything like that. But a lot of folks in the general public will think that complexity, first of all, Complexity is not good. Um, you know, who wants complexity? Nobody wants complexity. So the first thing is that this, this notion of complexity is like not a positive thing, right. And we have to correct that a little bit because. Complexity is what makes parties cool. Complexities is what. Football games and soccer games and basketball games and, and, and the Olympics and, you know, sports amazing. Complexity is what makes a play fantastic. Complexity, is what, makes poetry remarkable. Right? Complexity's what makes nature so stupendous, you know? I mean, complexity is what gives things richness. Right. Robustness, adaptability, fluidity, the unexpected. All of that comes from complexity. So it's a good thing. So it is a good think. Complexity like. The things we enjoy the most is complexity. So, you know, if I were to give you like a theatrical play and you just did it exactly like the script said, it would be a terrible play. It would be terrible movie, right? Right. We've seen terrible movies where the actors are all stiff and, but something about. when an actor can bring themselves to it and bring that richness, and it's very complex what's going on, but that's what brings a movie to life. That's what-

**Speaker 2** [00:04:19] dynamicism.

**Speaker 1** [00:04:20] Yeah, the dynamics and the energy in an exchange. Absolutely. So complexity, first of all, is like what we all appreciate about things, right? I mean, if everybody just did what they did in practice, it would never amount to the craziness that is a soccer game or a lacrosse game or football game or basketball game or any of these sports, where... you know, the unexpected happens, craziness happens, right? And all of that robust stuff, that sort of unexpected stuff, that is complexity. So, you know right off the bat, we have to kind of redefine what we think of as complexity. We want complexity in our life because we want richness in our lives, okay? The second thing that we have understand from the science of complexity. is that we would typically think of complexity as being synonymous with complicated, right? That these are synonyms. If you look, if you Googled synonymes of complexity, one of them would be complicated.

**Speaker 2** [00:05:35] And that is why people think of it as negative, right? Because of that association.

**Speaker 1** [00:05:41] And in complexity science, those two things couldn't be more different. A complicated system is not the same as a complex system, right? So a Boeing 747, you know, jetliner is a complicated system. It's complicated. no matter how, no matter what schematic you look at, it's. You know, it's got a lot of things going on, a lot of relationships, a lot of things going on, but it's entirely predictable. Well, I mean, you know, you press this button, it does this thing, you know, so let me, I'll give you an example. Say that you should never, you know, uh, do what I'm going to explain, but, but uh, say, say I can like gage my leg to kick the same way, the same three times, right? And say I kick a ball, you know, or a rock, let's say I So I kick the rock. Well, the rock's gonna do this. When I kick it, the rocks gonna do what it does based on the laws of physics, right? Then I kick again. And if I kick with the same force and the same situation and all that kind of stuff, it's gonna to do the same thing, right.

**Speaker 2** [00:07:02] So you're going to get the same result every time.

**Speaker 1** [00:07:03] Same result. I kick it again. Same result, very predictable results. Well, the physics behind that is quite complicated, but it's not, there's no sort of complexity really happening, right? You kick a rock, you get, you know, same stimulus, same response. But if I kick a dog, don't kick dogs, obviously.

**Speaker 2** [00:07:27] but for educational purposes only.

**Speaker 1** [00:07:29] educational purposes. If I kick a dog, maybe the first time I kick the dog, it kind of cowers away. And the second time you kick a do, it maybe stands its ground and growls at you. Yeah. The third time you kick a d, it bites you. Appropriately so. Well, that's an example of a an adaptive system, a system that that dog is an adaptive syste. You're giving it the same stimulus. but you're getting different responses.

**Speaker 2** [00:08:01] So complicated, same stimulus, same response, over and over again, complex, same stimulus, different response, because that thing is adapting from time one to two to three.

**Speaker 1** [00:08:14] You know a complicated system is very different from a complex system because a complex System is adaptive and that's why we call them complex adaptive systems or CASS, right CAS So We want our organizations to be complex and adaptive. We want our children to be Complex and adaptive we want our lives to be Complex and adoptive ironically even though we wouldn't describe it that way. We want that Right. We wouldn't use those words Right? But we actually want that we might because we're nerds. But we want to have complexity in our life. We want to that robustness, that adaptivity, that liveliness, that aliveness. And a little bit of unpredictability. And a bit of a unpredictability, even when we do eye movement research with little babies. What do they pay attention to? Why does eye movement study, why do they work? Right? They work because the baby is gonna pay attention to something novel. Yes. So we can tell when the baby changes, you know, we can see what's novel to the baby, what's new to the the baby. Yeah. Right? Well, we're the same way. We like novel things, right? And novel things come from complexity.

**Speaker 3** [00:09:34] Interesting

**Speaker 1** [00:09:36] The unexpected comes from complexity. Okay, so going back, first of all, complexity is not a bad thing. It's a great thing. It's not just a great things. It's the thing we all want. We all love. You know, it's the things that makes us so excited when we go to hockey games or, you know, things like that. It's that thing that gets us excited about love. It's all of that's complexity. Second, complexity is the same as complicated. Right. Okay, that's the second thing that we have to understand. A complicated system, you might even go so far as to say complicated systems, they're kind of boring. Complex systems, really interesting.

**Speaker 2** [00:10:16] Would it be fair to say complicated systems are more static and complex systems are more dynamic?

**Speaker 1** [00:10:21] Yes. Yes.

**Speaker 2** [00:10:22] in that sense.

**Speaker 1** [00:10:23] Absolutely. So another another example I give you is say you have a train system while a train and the the tracks and all that kind of stuff. Very complicated, right? But if I cut the track that everything downstream from the me cutting the track. Yeah, it's gonna stop. until we fix the track. But now take a road system, like a system of roads, right? If there's an accident on your way to work, what do all those little agents in their cars do?

**Speaker 2** [00:11:02] better.

**Speaker 1** [00:11:03] They adapt. They go, they take a different route. Do they all take the same different route? No, they'd take different, different routes. And the system literally adapts to the injury. Interesting. So a road system with cars and independent little agents driving the cars is a much more complex system that has many more degrees of freedom and adaptivity than a kind of linear you know, railroad system. Now, the railroad system is complicated. There's tremendous complicatedness, but it's not a complex and adaptive system, right? The road system is gonna adapt. Okay, so that establishes the second one, which is differentiating complexity from complicated. The third thing, and this is like mind blowing. To me, this is happy mind blown emoji. which I created just for this kind of idea.

**Speaker 2** [00:12:03] We love that.

**Speaker 1** [00:12:04] uh... there were no and as a as an aside

**Speaker 2** [00:12:08] Why not?

**Speaker 1** [00:12:13] I should have worn that t-shirt. I would have said no, and we were going to talk about this. No, it's not funny.

**Speaker 2** [00:12:16] No, it's not fun if you know what we're talking about.

**Speaker 1** [00:12:17] Yes. So, as an aside, I have a serious issue that I have to share with you and our audience. It's a serious issues.

**Speaker 4** [00:12:31] Wait, we're getting serious.

**Speaker 1** [00:12:32] All of, all, every single one of the mind blown emojis that exist today. Yes. And that's, you know, Microsoft makes emojis and Google makes, everybody makes emojis. But all of the emojis that are out there that are mind blown emoji's are all like shocked and or like unhappy, sad or scared looking. But there's no happy mind blown emojis. So I created a happy mindblown emoji. I know. I call it the H-M-B-E. Happy mind blown emoji.

**Speaker 2** [00:13:16] I love your accent.

**Speaker 1** [00:13:16] HMBE. So the happy mind-blown emoji is critical because when you have your mind blown, which science does for you all the time, when you really get into like cool science, the whole point of it is that it blows your mind. Like you go, oh my God, that's incredible. And you're like happy about it. You're like, it's so mind-blowingly incredible. And some of the most simple and basic things are mind blowing.

**Speaker 2** [00:13:43] in a good way.

**Speaker 1** [00:13:45] profound and sublime way. We should start selling those TVs. Right? So, first off, I just want to put in a plug for like the big emoji industry. They should change the sad mind blown emojis, the SMBs and the spooky Mind blown emojis, also SMBs, to HMBs.

**Speaker 2** [00:14:24] Is there an emoji industry?

**Speaker 1** [00:14:26] There's an emoji syndicate, there's an emoji industry, an emoji mafia, whoever controls the emoji space. I'm talking to you.

**Speaker 3** [00:14:37] Oh my go-

**Speaker 1** [00:14:38] Change it. We need more having bone-in-bone emojis. That's funny. That's, that's an aside that has very little to do with what we're talking about. But anyway. So we were talking.

**Speaker 2** [00:14:53] What are you talking about?

**Speaker 1** [00:14:53] So I'm about yet now three. Yes

**Speaker 2** [00:14:55] Which is going to blow your mind.

**Speaker 1** [00:14:57] Which is going to be an HMBE.

**Speaker 2** [00:14:59] H-M-B-A-R-

**Speaker 1** [00:15:00] And if it's not an HMBE, a happy mind-blown emoji, then what? Then there's something wrong with it. Because this should blow your mind.

**Speaker 2** [00:15:09] or buy the t-shirt.

**Speaker 1** [00:15:10] This should blow your mind. So a lot of times with students, I say it like this. Sometimes with seemingly simple ideas, seeming like kind of basic ideas, sometimes somebody taught me how to drink wine once. I think, yes. It was probably you.

**Speaker 2** [00:15:27] Well, we took, I took the Cornell.

**Speaker 1** [00:15:29] Yeah, you taught me.

**Speaker 2** [00:15:29] and I tie.

**Speaker 1** [00:15:30] Yeah, yeah, so you taught me how to drink wine because I didn't know how to do Yeah, I mean I knew how to dream like swallow wine, but I didn''t know how to taste know how actually appreciate wine right you know when you take wine yeah apparently you're supposed to like first you smell it and you know this look at it you do the swirl you look at the legs and all that kind of stuff and and then when you but the one of the things I learned was when you put it in. in your mouth, you let it sit on your tongue, because your tongue has all these, and then you kind of breathe over it. You kind of ripple air, and you cause it to ripple on your tone, and that aerates it, and you actually, if you try this at home, this is something you can try at home. It makes a huge difference. You're like, whoa, I can really actually taste this thing. You almost chew it. You're chewing the wine, right? Can you experience that?

**Speaker 2** [00:16:26] Lottie of the wine yeah

**Speaker 1** [00:16:27] Yeah, it's cool. Yeah, I thought it was cool.

**Speaker 2** [00:16:30] It is cool.

**Speaker 1** [00:16:30] So that was an HMB moment for me. I was like, whoa, something so simple really actually changes your experience.

**Speaker 2** [00:16:38] That's right.

**Speaker 1** [00:16:38] So sometimes I use that metaphor when you come across certain ideas, which, you know, for really intelligent people, they're going to just be like, oh, yeah, whatever, and they just move on. Right. Right? But I always tell that story of Einstein and how the reporter asked him, like, how did you discover relativity? And he says, oh that was easy. when when all my grade school companions have moved on to more advanced things. I got stuck on like, time and space, and I stayed stuck until I was 30 years old. You know, something so basic, so simple, sometimes we skip over it.

**Speaker 2** [00:17:25] So we were talking, you're about to tell us number three, which is going to blow our minds. You said.

**Speaker 1** [00:17:31] So what I'm trying to say is, number three, this is all set up for number three.

**Speaker 2** [00:17:36] I know, I'm saying. Yeah. We're ready.

**Speaker 1** [00:17:38] You're ready. You have set us up. So you got to chew this. It's going to seem simple. It is going to be ridiculous. It is going seem like whatever. Did he just say something important? But you got let it sit on your tongue, on your brain and marinate in the folds of your brain.

**Speaker 2** [00:17:57] We are all on the edge of our seats.

**Speaker 1** [00:18:00] Remember I said complexity and complicated are gonna be synonyms. Well, complexity and simplicity are gonna be antonyms. Yes. They're gonna be completely the opposite.

**Speaker 2** [00:18:11] Yes.

**Speaker 1** [00:18:17] Complexity and simplicity are two sides of the same coin.

**Speaker 2** [00:18:21] interest.

**Speaker 1** [00:18:22] That's the beauty of it. And everybody from Prigogine at the turn of the century, all the way to the modern day Santa Fe Institute, where I did some of my studies, and Murray Galman, and just some really fantastic minds discovered, some pretty sharp people discovered this deep connection.

**Speaker 2** [00:18:50] between complexity and simplicity.

**Speaker 1** [00:18:52] Yeah. In fact, Murray Gell-Mann, who won the Nobel Prize, he kind of was instrumental in discovering quarks. He actually didn't want to call the science of complexity, complexity science. He wrote this very simple paper called, Let's Call It Plectics. And the whole point of that very short paper was, hey, you know, We're at the cusp of this new science called complexity science, and I think we shouldn't call it that because it's a misnomer, because it doesn't capture the idea that simplicity is so much a part of it.

**Speaker 2** [00:19:32] That simplicity is so much a part of complex.

**Speaker 1** [00:19:33] Yes.

**Speaker 2** [00:19:34] that they're so inter.

**Speaker 1** [00:19:35] that they're so interrelated that we shouldn't even try to separate. So he suggested we call the science Plectics. It never caught on, but Plectic comes from the root Plec, and Plec either means like intertwined or braided. I see. So Plec is actually at the root. It's the root P-L-E-K is in the word Simplex. precedes simple and also complex.

**Speaker 4** [00:20:09] I see.

**Speaker 1** [00:20:11] Ironically, in our language, it's in simple and it's in complex. Right. Right.

**Speaker 2** [00:20:16] So he's saying plectics because that gets to what's common between them.

**Speaker 1** [00:20:21] that there are simple rules that underlie the complexity. Simple rules that underlying the complexity and this is a HMBE moment. This is like a happy mind-blown emoji moment where you go like, whoa, wait a minute. These two things that we think of as totally antonyms are actually inseparably intertwined. Simplicity. actually drives complexity.

**Speaker 2** [00:20:54] Okay, interesting. So you said simplicity underlies complexity. There are simple rules.

**Speaker 1** [00:21:00] That's what

**Speaker 2** [00:21:00] Simple rules underlying the behavior of complex.

**Speaker 1** [00:21:05] So the way that these complex adaptive systems tend to work is that they have a lot of agents. Now an agent can be anything, an agent could be an ant, it could be a person, it can be a person in a car, it it could a bird, it be a lion, it actually be groups of things. So it could companies, it would be towns, it will be countries in a large geopolitical space. the agent is kind of a generic term that just means like the the thing that has agency to follow certain simple rules and those simple rules could be things that they've adopted or they could be things that are literally kind of programmed into their genetics right right right so you know our dog kachi kachi is an australian cattle dog she's very cute.

**Speaker 2** [00:21:59] She always gets overshadowed by Bruce.

**Speaker 1** [00:22:01] because Brutus is so big and sits on her. But Kachi is an Australian cowdog, a blue healer, and she herds people. She herds you by nipping your heels, right? She herders you where she wants you. Well, Kachi's never met a cow. She's never been a herding, an actual herding dog. But somehow that's built into her genes, into her genetics, right. She was born with that, that sort of intuitive ability. Oh Yeah, it's encoded in her. So some of these simple rules can be actually encoded in organisms, and then some of them are learned. Remarkably, all these complex adaptive systems have simple rules underneath.

**Speaker 2** [00:22:49] You said a lot there. Simple rules, agents, blah, blah blah. Give us an example. Give people an example, you know, like.

**Speaker 5** [00:22:58] There's a lot of stuff

**Speaker 1** [00:22:59] Blah, blah, blah.

**Speaker 2** [00:23:00] So I like to hear examples, animals, people, stuff.

**Speaker 1** [00:23:04] Well, let me give you an example. Yeah. All right. So we're going to do, let's say that we have an antil.

**Speaker 2** [00:23:14] Okay, so you've got one thing that's an inhale.

**Speaker 1** [00:23:17] and it's got a bunch of ants in it, right? But these aren't the ants. Let's say that you have one pile of food that's like here, close to the anthill. And then another pile of foods that's a little bit further from the anthil. And another pile food that's even further than that one. All right, so you have three piles of food.

**Speaker 2** [00:23:39] And they're all different distances from...

**Speaker 1** [00:23:41] They're all different distances from the ant hill. Well, the basic goal of the ants is to get some food, but they don't want to spend a lot of time out and about, you know, because they could be susceptible to predation or something like that, right? So they want to quickly and efficiently get food. Now each individual ant is relatively not smart.

**Speaker 2** [00:24:03] Well, it's neuronally challenged.

**Speaker 1** [00:24:06] Neuronally challenged, yes, so it has this, you know, like a single neuron for a brain or whatever. You know what I mean? So the ant, each individual, no individual ant would be able to do something intelligent and strategic with this food situation. Not even be able sort of see the situation to begin with, never mind navigate it, right? So you think to yourself, okay, we got basically a dumb ant. Now we're going to multiply that ant by 100,000 ants.

**Speaker 2** [00:24:40] That's a lot.

**Speaker 1** [00:24:41] It's a lot of ants. So you think I got a dumb ant, I'm gonna add a couple hundred thousand more dumb ants. What am I gonna get? I'm going to get super dumb.

**Speaker 2** [00:24:53] That's a lot.

**Speaker 1** [00:24:54] Right? A lot of dumb. Right? Right. That would be what you would expect, right? You add dumb plus dumb plus dumb, you're not going to get smart. That'd be crazy, right. You're going to get dumb. Yeah. But that's not what happens. So here's some complexity because it's surprising. Right? The baby goes, what? Right? You're like, what, what just happened? Right? Well, it's a callback to this.

**Speaker 2** [00:25:22] That must be some internet thing that I'm not aware.

**Speaker 1** [00:25:24] No, the baby. Remember the baby with the eye movement? The whole baby sees that.

**Speaker 2** [00:25:30] I thought it was some meme or something. You all talk about memes, what the hell's a meme?

**Speaker 1** [00:25:34] No, the baby, if a baby was watching that.

**Speaker 2** [00:25:37] they'd be like, wow.

**Speaker 1** [00:25:38] They'd be like, oh, interesting. Something interesting is happening, right? So what happens in these ant hills is the ants go out, they look for food, they gather up the food at the closest one first, the second closest one second, and the third closest one third.

**Speaker 2** [00:25:57] as if they planned it all along.

**Speaker 1** [00:25:59] So you're like, wait a minute, that's pretty intelligent behavior for a bunch of dumb things. So where did the smart come from? If all that is in this system is dumb, if all the agents are effectively dumb, and by dumb I don't mean that they're like literally stupid, I just mean none of them are capable of doing that. By themselves. By themselves, and yet that happens. So where does that come from. Where is the intelligence in the system? Is it in the ants? No, is it in this system? Well, apparently, cause the system is doing something intelligent. Right. But where does it come from?

**Speaker 2** [00:26:42] I just had this mental image of one ant with a megaphone standing at the top of the hill directing them.

**Speaker 1** [00:26:48] Yeah, well that that's actually

**Speaker 2** [00:26:50] Johnny, go left.

**Speaker 1** [00:26:51] We've been looking at these systems for thousands of years and that's actually what we believed. We believed for a long time that there must be some A-type personality, like General MacArthur kind of ant that's like, I am going to teach you all what to do, right? But the problem is that there isn't, and in many of these systems there's not even enough time for that kind of communication to occur, so we know that that's not what's happening. In fact. What these systems are is self-organizing. They're not organized by a leader. There's no leader. They're self- organizing systems, right? They literally self- organize. And they're super organisms, meaning they're like a bunch of little individual organisms that are acting like a single super organism. We see these in the murmuration of flocking behavior in fish schools, in ants, in traffic patterns, in the way blood flows, all kinds of things.

**Speaker 2** [00:27:49] Yeah, the most popular one is the fish, all the fish seeming like they're one bigger fish. Like a shark or something. There's closer stuff in here of course.

**Speaker 1** [00:27:57] The question is, where does the intelligent behavior come from? And the answer is, so the intelligent behavior is what's complex. That's the emergent property. So out of this system emerges intelligence. Right. Intelligence. out of stupidity, individual stupidity comes That's, that's like, wow.

**Speaker 2** [00:28:29] that as well.

**Speaker 1** [00:28:30] So where did it come from? Is it magic? No. It turns out that these ants are just following simple rules. And that's where the simplicity is. Simple. And in this particular case, it's just three simple rules. One, go out and find food randomly. Two, when you find food, shoot pheromones out of your butt. Never cross a pheromone trail. And it's that third one that's really dynamic, right? Never cross, if you're just walking around looking for food and you find a phereomone trial, you get on it. You can't cross it. And once you get it, then that increases the probability of you finding the food, which increases the probability of you shooting pherromones out of your butt, which increases size of the pheromo trail, which attracts more ants, which causes a cascading effect. to find that food faster, bring it back to base.

**Speaker 2** [00:29:31] Right, so the rules lead to that collective behavior and that collective behavior leads to the outcome of the system.

**Speaker 1** [00:29:38] So when we ask the question, where did this intelligence come from? It came from the simple rules. So where did the complexity come from, the thing that's cool? Remember we talked about complexity is cool? The thing that is cool, where does it come from. It came form the simple roles. So all of this, I know we haven't really been talking about the topic, but all of these now we can bring back to why. the Constitution of the United States of America is such a remarkable document. Yeah. Because it's the simple rules. It's the simple rules that give us the robust, beautiful, dynamic complexity of democracy. we have to take care of the simple rules. Yes. We have to real close care of the simple rule because if we change those rules without thinking deeply about why those rules are there, then we'll change the whole system.

**Speaker 2** [00:30:44] Yeah, the outcome of-

**Speaker 1** [00:30:45] The outcome, the big macro outcome is the result of these micro rules. The big complex wow outcome, human democracy, is the results of these tiny little micro simple rules. and if we change them without thinking deeply about how they will dynamically play themselves out, bad things can happen. Let me give you an example. Let's say you have these two ants. Maybe there's one ant that's kind of like rebellious and like kind of doesn't like on the rules.

**Speaker 2** [00:31:29] We could call that Aunt Derek.

**Speaker 1** [00:31:32] And then there's this other aunt that's like Laura, and she's like, no, we gotta fall under rules, right? And so like, let's say you're like, hey, you know this kind of ridiculous rule about how you can't cross the Pheromone Trail? Yeah. I think we should cross it. And she says no. She's like no. We should not. Let's not do that today. That would be bad. Yeah, that would be that. Senigo, but You can see the tyranny inherent in the system that we can't cross this pheromone trail. We should just cross this Pheromones trail. What's it going to mean? It's no big deal. One trail. One little step. Let's just try.

**Speaker 2** [00:32:15] She says no.

**Speaker 1** [00:32:16] She says no.

**Speaker 2** [00:32:17] Gotta follow the rules. The rules are there for a reason.

**Speaker 1** [00:32:21] just cross the pheromone trail, right? And you can imagine having this big debate about crossing or not crossing the phereomone Trail. And you could imagine in a Parisian cafe, smoking cigarettes, having some philosophical debate about this, but if you've limited it to just whether or not you're crossing the Pheromones Trail or not and how ridiculous it is and how oppressive it is that you can't cross the Phereomones trail and you're... just debating at that local level.

**Speaker 2** [00:32:51] Yes, without the global occasion.

**Speaker 1** [00:32:52] Without the global implications of what that would do to the entire colony if everybody started crossing the pheromone trail, then you're missing the connection between the simple underlying rules and the complex emergent wow. The outcome. The thing you want. The wow factor. Right. Right? The wow factors coming from the simple rules. So, again, bringing this back to democracy. and the Constitution. We're doing that all the time, those two little ridiculous ants that are having that ridiculous philosophical conversation. We're doin' that all of the time. We take one of the amendments and we debate, why shouldn't we do this or do that or blah blah blah, or it's not about hunting or whatever. And we don't take into account the bigger picture, right? We don't taken into account, the bigger pictures. So the First Amendment is one of our rules. And the First amendment is about the freedom of speech. Yes. Now that's guaranteed most of the time. There are some very small cases where it's not. You can't yell fire in a theater, for example. There are a few guard rails. There are few guardrails. But generally speaking, It's the protection of speech. Will people use that protection to say things that offend us? Yes, will they use that protection to do things, you know, to say things that we wish they wouldn't say? Absolutely. Hateful things. Right. But does that mean we should stop them from saying it?

**Speaker 2** [00:34:36] I mean, if you go anywhere that doesn't have that right, you understand why we need the right.

**Speaker 1** [00:34:40] That's right. And so, and what would happen once you start that? Once you start that, a cascading effect happens that affects the macro, the thing you care about. Because like, in the whole scheme of things, do we care if Joe Schmo can't say his vitriolic hate? Not really. Like, I don't give, I don't care if Bob can't be vitriol. What I care about, though, is if we Wow. And then we stop Frank, and then Frank and Bob get into power and stop me. Right. And, you know, blah, blah blah. And it's not democracy. Then it's democracy. I care about the wow, the complexity is what I care.

**Speaker 2** [00:35:21] Meaning the thing that we all value so much, the concept of democracy, is so critically dependent on the simple rules.

**Speaker 5** [00:35:32] That's right.

**Speaker 2** [00:35:32] and the dynamics between and among them at the local level that happen over time to create what we know and what we want. And the problem is, as you said, we tend to cherry-pick into these tiny arguments. Not only that, we politicize them, we have agendas, we manipulate, and we lose the wider context. And it's very easy to get distracted by that local heated argument. and lose that context that matters so much. And people do that on purpose.

**Speaker 5** [00:36:04] That's right.

**Speaker 2** [00:36:05] people do it on purpose, because they have an agenda. They have, oh gosh, that would be a whole other podcast of all of that, but I mean, it's hard for people, I think, to. I think people lose that connection. It's hard to see that connection

**Speaker 1** [00:36:24] It's very hard to see. In fact, it's so hard to see because simplicity and complexity are antonyms in the general sphere, right? Complicated and complex is not a good thing in the general sphere. But if we understand that complexity is the wow, complexity is love, complexity is a cool sporting event, complexity is the thing that we absolutely, that grabs us. Democracy gives me chills, real democracy, that we haven't gotten there yet, but we're a more perfect union, right? We're working on it. Well, sorry. A more perfect Union. A more Perfect Union, we're not there yet. But we're always striving for a more Perfect union. Right. That's my favorite line, we the people in order to establish a more, perfect union. We focus on the, we, the people part. Right. But the cool part is the more perfect, that they're better every day. that we're going to get better every day, we're gonna, it's not perfect, but we're moving where

**Speaker 6** [00:37:31] working on it.

**Speaker 1** [00:37:32] in the trajectory of more perfect for everybody. Right. That's based on those rules. Those simple rules is what brings about that more perfect union, that more perfect democracy. And if we start whittling away at those simple rules without understanding how they manifest in the macro, how the micro manifests in the micro.

**Speaker 2** [00:37:58] And that, you know, that holds for either end of the extremes, like whatever you're trying to do. When you're messing with a simple rule or an amendment or some tenet in the Constitution, it doesn't matter what perspective you're coming from, you have to understand the wider context. You have to under the wider effect of those changes because they go through the whole system.

**Speaker 1** [00:38:21] Yes, and our Founding Fathers, obviously you can look into a man's history and his past and his personal life and you can find all kinds of things that maybe he wasn't perfect. None of us are perfect.

**Speaker 2** [00:38:38] I'm just kidding.

**Speaker 1** [00:38:39] You know, so aside from the fact that none of us are perfect, and none of our founding fathers were perfect, they collectively came together and did something quite magnificent together. Yes. They did something magnificent together, and statistically so. Our constitution is statistically different than all the other constitutions in the world. If you look at the actual science of constitutionality. And the degree to which these constitutions evolve and don't. Our constitution is unique statistically speaking. We have to understand that our founding fathers collectively, not individually, but collectively did something quite unique, quite rare and inspired. Right and they came up with some rules and those rules actually are dynamic with each other just like the ant rules, like shoot pheromones, never cross the pheromon trail. Yeah, they're all real. Amendment one, not amendment two. Amendment two guarantees many of the other amendments. So people say all the time, why do you need this type of weapon for hunting? Well, amendment two is not about hunting. Amendment two is about hunting, Amendment two was the second amendment. was about how absolute power corrupts absolutely. And eventually, the people would have to possibly defend themselves against governments. And the Second Amendment was designed to make it so that the government was always more afraid of the people than the people were of the government.

**Speaker 2** [00:40:32] Right, and during the time that it was written, that makes total sense. Yes. Yes. And even now it makes total since. I mean, it makes a total sense as a rule for society and for organizing ourselves, it makes sense. Yes. And I think what is interesting about that is that's a great example of people taking their political agenda and trying to dissect and manipulate the public's understanding of the meaning of that amendment for their own purposes. out.

**Speaker 5** [00:41:01] Absolutely.

**Speaker 2** [00:41:02] they do it with free speech, they do with Miranda, they do with everything. And I think that's, I think that's the wider point, which is, remember that these, these tenants, these amendments are the rules in place. They're all interconnected, and they need to be happening.

**Speaker 1** [00:41:23] and we need to look at them at the macro level, not the micro, because all these debates, all these bifurcating, all these polarized debates, it's fine, we should have those debates. We should encourage those debates, that's what the First Amendment's all about. We should courage those debates to happen. All I would love to interject or inject into those debates is that they should happen at two levels. And they're mostly happening at the micro level. They're mostly at, there's this thing that's happening in schools, which we all hate, right? School shootings, terrible. Nobody is for that. And that's at a micro level, right. And so we all want to respond to that. We all want to respond to that and we should respond to that. but what does our response look like at the macro level?

**Speaker 2** [00:42:28] That issue in particular, we know, because we've talked to the violence project and the people who have really done the research, that that is a web of causality, which means it's a web a solutions. There's no one quick fix, but it's the interconnectedness between the solutions that's gonna matter because of the interconnected-ness between and among the causes. So I think that's what you mean when you say go up to the macro level and see the bigger picture and don't try to...

**Speaker 1** [00:42:56] And not just the bigger picture of decreasing a particular thing that you want to decrease or increase in society, but the biggest picture of do we want a people, a government of and for the people, i.e. democracy. Do we want to continuously strive for a more perfect union around a government, of and for the People? Now I know that. There are aspects of our government that are not. but we're continuously striving for that.

**Speaker 2** [00:43:33] Yes, and I think we need to be willing to have the conversations about the about from both perspectives from all perspectives and not continue to be polar polarized. Yeah, I'm glad you said I'm

**Speaker 1** [00:43:46] Yeah, I'm glad you shifted from, you know, to all perspective, because there's not the other thing that we do all the time is we assume there's two perspectives, right? Because we are very bivalent. But there's many perspectives like the web of causality. There are many different things that cause any given one thing. Anyway, we're getting a little bit off track on on on that. But but

**Speaker 2** [00:44:12] There are so many things that we think we understand, just on their face, right? And so when you say the U.S. Constitution, we all think we have our own mental model of what that is and what it means and how we interpret it, embody it, whatever. But the truth of the matter is, I don't think, like you were saying, the micro-macro, the simple rules, the agents, the dynamic of that leading to the outcome of what we all. want, which is democracy, and also knowing that democracy is a work in progress.

**Speaker 1** [00:44:42] a work in progress.

**Speaker 2** [00:44:44] You know, I think that...

**Speaker 1** [00:44:45] beautiful work in progress.

**Speaker 2** [00:44:46] It's amazing.

**Speaker 1** [00:44:48] It is, by definition, the emergent property, the complexity that emerges out of a system of simple rules and free agents, agents that are free, they're free, right? Our Founding Fathers somehow stumbled upon, either by hook or crook, by genius or by mistake, who cares? But, they somehow stumbled on. a deep understanding of the most advanced science we have today, complexity science. And they built our constitution somehow based on it.

**Speaker 2** [00:45:33] and our country.

**Speaker 1** [00:45:33] and our country. And it is so remarkable. It's such a remarkable document. And it is an evolving document. It should evolve, and it has stipulations about how it can evolve. And we should evolve it. The only thing that I hope people take away, I guess on this, this is the July 4th episode.

**Speaker 2** [00:45:54] This is the July 4th episode.

**Speaker 1** [00:45:55] So, the thing that I hope they'll take away from it is just this understanding of democracy is the wow of complexity. It's the emergent, it's the thing, that emerged. Democracy is not a thing. It's a thing that comes out of the system. It's not a think you put into the system, it is a thing comes out the system it's the wow. It's this sporting event that you go, wow, how did that happen? How did democracy happen? Oh, okay, what are the inputs? Thank you very much. The inputs are the free agents, right, the semi-autonomous agents, as we call them. and the end of simple rules. And so take care of those simple rules because they matter. So have the debate about crossing that pheromone trail. Have the debate. because things evolve, but understand what the debate is really about. It's not about those two ants crossing that trail. It is about all the ants crossing all the trails.

**Speaker 2** [00:47:04] It's actually about all the ants.

**Speaker 1** [00:47:05] and the emergent property that comes out when all the ants cross all the trail. And in that particular case, the emergant property that would result from that change in the rules would be the annihilation of the colony. Yes. Let that sink in. Yes. So if we think about this as a simple conversation about two ants in a pheromone trail, we're kind of missing the whole point, which is the annihiliation of the Colony. is being discussed. That's right. Because we're missing the connection between the collective dynamics of all the different agents following those rules or not following those roles, or following those role in this way versus that way. Right. The collective dynamics of all of those 300 million agents following rule one way versus another is what's gonna lead to what we call our democracy.

**Speaker 2** [00:48:03] and we have to take care of it.

**Speaker 1** [00:48:05] Yeah, we got to take care of it because it's remarkable.

**Speaker 2** [00:48:07] We all have a role in

**Speaker 1** [00:48:08] Is it perfect? Absolutely not. Have we? Dumb things, sure, but it is absolutely unique among democracies. It is something we should take care of.

**Speaker 2** [00:48:23] And we should think about that and remember that.

**Speaker 1** [00:48:26] That document is an inspired document.

**Speaker 2** [00:48:29] It is. And we are all very lucky.

**Speaker 1** [00:48:31] You're very lucky to have.

**Speaker 2** [00:48:32] Very lucky. And with that.

**Speaker 1** [00:48:34] And it can evolve. It actually captures how it can evolve and that it should evolve. And it has evolved.

**Speaker 2** [00:48:41] It adapts. It adapps to the times. It adapts to the needs. It adapts the things that come up.

**Speaker 1** [00:48:46] But we got to understand how it plays into the macro. We often say the micro makes the macro, the micro make the macro it's these micro agents and the micro rules that they're following that add up in dynamic ways to create the macro picture that we see.

**Speaker 2** [00:49:08] So when you're watching the fireworks, eating hot dogs, remember how lucky we are and how much a part of the system we are and that we all have a responsibility for helping to shape the outcome.

**Speaker 1** [00:49:21] Absolutely.

**Speaker 2** [00:49:22] And we're lucky. We are. Very lucky.

**Speaker 1** [00:49:24] We've got work to do.

**Speaker 2** [00:49:26] All right, what do you think for that?

**Speaker 1** [00:49:27] Is that it?

**Speaker 2** [00:49:28] Is that a wrap? I think that's a wrap. Happy Fourth of July, everyone.

**Speaker 1** [00:49:33] Happy Fourth of July!