The Garrison Institute Presents: The Common Good Podcast Transcript

Suzanne Simard: Forest Ecology and Lessons from the Mother Tree (Episode 3)

[Please Note: Although the transcription is largely accurate, in some cases it may be incomplete or inaccurate due to inaudible passages or transcription software errors.]

Suzanne Simard: For a long time, the theory of individual selection or the selfish gene dominated our thinking, not only in the evolutionary biology, but also it translated into how we looked at ecology and how we looked at our economies, and it led to the survival of the fittest, the dominance of the best. And when you live in a forest or when you're restoring a bit of land, or even going out and growing your garden.

You don't have to read these papers to understand that a forest or a community of plants is a community, and that their health and their vitality comes from being in community.

Jonathan FP Rose: Welcome to The Garrison Institute Presents The Common Good. I'm your host, Jonathan Rose, co-founder of the Garrison Institute. Today we are very honored to welcome Dr. Suzanne Simard, a groundbreaking forest ecologist and the author of *Finding the Mother Tree*. Dr. Simard's research has forever changed the way we view forests, not as collections of individual trees, but as vibrant, interconnected communities where cooperation, communication, and care are central to their survival.

Our conversation will explore the wisdom of the forest, profound lessons of interdependence, and how these insights can inspire a deeper sense of kinship and responsibility for the common good of all of life. So, Suzanne, welcome.

Suzanne Simard: Thanks for having me.

Jonathan FP Rose: So let's begin in the forest itself where you grew up, you grew up really in the womb of the forest.

Suzanne Simard: Yeah, that's a really good way of saying it. So I grew up in British Columbia in what we now call the inland rainforest. So the inland rainforest is very productive. You know, it's wet, it's warm, it's perfect for the growth of great old trees. These trees can live for a thousand years or more.

And so I grew up in these old, what we now call old growth forests where there are cedar trees that are as, as wide as your arms can reach across. There are hemlock trees that grow nestled among the cedar trees, that the plants and the understory are diverse and lush, and they're over your head, that the soil is deep and soft when you walk through it. You know, you spring through life and the rivers are flowing and they're vibrant and full of salmon, and my family lived in these forests. So that's how I got to know forests is just the very essence of life. This gave us life. It gave my family also a livelihood. You know, we lived in and off the forest. We were wood cutters and that ancestry dates way back, I would say

we, we lived in balance with the forest and that is what I learned in what, how I formed, how I do my work.

Jonathan FP Rose: Your grandfather and your uncle would selectively harvest trees and then float them down the river. The river had to be in the right condition for floating too, so it was really attuned to natural processes.

Suzanne Simard: Yes, it was. It was all of course manual as you say, but also full of innovation and invention. And so when you're harvesting some of these great trees, which selective harvesting, so they would just take particular ones in a forest, a few right? And then to manage these great trees, you had to be an inventor.

And so my grandfather and his father and his father and my ancestors were constantly innovating so that they could manage these great trees. And so that meant how do you cut one down, first of all, and there were no chainsaws back then. There were crosscut saws. How do you do that?

And the length of time it took. You know, sometimes a week to cut down a tree and then you fell the tree and you gotta haul it to a flume that you made by hand. Right? And then you've gotta, you know, get the tree to go down this flume and then land in the water in a way that didn't disrupt the entire ecosystem. And you're right, like the rivers had to be flowing at the right time, you know, re-released with the spring fresh shut so that they moved.

And this went on for, by the time I arrived, my, my family had been doing this for a hundred years. And you walk in the forest and you couldn't tell anybody had been logging in there other than what, you know, they would say, oh, here's an old horseshoe from the 1910s, you know? Um, but the forest would just rebound because all the legacies were still there, left behind.

Jonathan FP Rose: And then you went off to college and you began to study forestry and biology and forest processes, and you got a summer job and you began working for a forestry company. And you were asked to figure out how to clear cut, which is the complete antithetical way of forestry you were just describing. So describe the clear cut and there's a such a brutality and colonialization mind that comes with that.

Suzanne Simard: Yeah, so there was a rapid transformation, I mean, constantly social transformations were happening, right? When Europeans came to North America, that was a huge disruption in how forests had been stewarded for millennia, and then in my lifetime, we'd rapidly changed from these small family operations, indigenous, non-indigenous, to these multinational companies that came in for different objectives.

You know, it wasn't to make a livelihood for local people, it was to generate profit for shareholders who were often distant. They were, didn't live in these forests, and so the goals changed from sustaining life to exploiting life, I would say. And so that exploitation

just spread across the landscape to now today we have only 2 to 3% of these big old ecosystems left, and so that was shocking to me as a young forester learning in the university that this is the way you do things.

And you just calculate it. It's all calculated out. It's all preordained that we're gonna convert this old growth landscape to this, what they call the normal forest, which is like planted trees and quite uniform. And that uniformity was meant to be economically efficient so that you know, you can go back and the roads are all there. The trees are predictable, they're all the same size. They're all the same species and then we can run them through the mill and that, you know, we'll make more profit. And it was just the antithesis of what I had grown up knowing even the way of seeing the world was different.

Jonathan FP Rose: You know, I actually wanna wind back a little bit before we keep going forward, which, 'cause you mentioned indigenous ways and before your settling family came, the indigenous people had a very deep interactive relationship with the forest. It was not a passive relationship, so maybe you could describe that.

Suzanne Simard: Yes, not at all. So where my family settled, so on both sides of my family, it was in what is broadly called the Secwépemc Nation, and that includes many small nations. Where my family settled, that nation was called the Splats'in and they still are there. What happened in the late 1800s is that, you know, when Canada was formed as a nation, these nations were put onto reserves, and so they lost access to their resources and they lost access to their traditional way of life, which was attuned to nature.

It was imbalance with nature because indigenous people see themselves as nature. And that we're all connected and relational, and the practices were developed over millennia, and so it worked right? They were wealthy in life.

Jonathan FP Rose: But, so for some of the practices, they would burn seasonally or?

Suzanne Simard: That was one of the practices, and that is important today because, you know, in the late 1800s when colonial law banned indigenous burning in Canada and that burning was meant to do certain things, and now we're coming back to realize what those things were. But one of them is to reduce fuel loads around communities.

One of them is to create, you know, open areas for food. Berries and wildlife and just the vibrant hydrology of the places. And you know, another one is just for their safety. You know, they could see who's coming. And it was like a beautiful balance. And then that was banned, outlawed. And so then these forests started to change very quickly because the burning was designed to be not severe like it was done frequently. Of course, it's all place-based practice, right? It's each place is different, but generally aligned with the cycles so that it's not severe, that it cleanses the forest to an extent, cleans out the understory, reduces fuel loads, and created this more open savanna type forest In many places, not in all places, of course.

And now all of that got disrupted, right? Stop the burning, the forest started to fill in and climate is changing at the same time. And so that now today we have this very volatile situation where fires are getting difficult to manage.

Jonathan FP Rose: Instead of local, this basically national and global industry comes and it doesn't view the forest as a ecosystem. It just views it as a plantation upon which it can plant stuff. And by the way, it views the workers as not owners who live and have a relationship with the forest, but just employees. And it sets you out and says you gotta plan a clear cut.

So then they do this replanting and it's a monoculture, which we know is a super unhealthy and the monoculture's not working. Describe to me the feeling of seeing these dead fields of struggling planets.

Suzanne Simard: Yeah. You know, and they weren't all dead, of course, you know, there were pockets of death, and that's what caught my eye. So the idea of the company was to plant a single species. That's easy. And they would pick a species that matched the ecosystem. So it's not like it was completely out there, but it was taking like a, maybe a forest that had 10 species of trees to reducing it to one.

And when you do that, you create all kinds of vulnerabilities. Like just an easy way to imagine it is, you know, if there's one specific beetle that attacks that tree that you planted, well you're gonna lose that tree. And that at first, when I started in the forest industry in the seventies. There was so much buffering in our environment and there was still a lot of old growth, like the clear cuts were not very extensive, and the ecosystem was able to buffer the mistakes and provide enough diversity in additional seed sources, for example, from neighboring forests.

That diversity was able to maintain a sense of itself, and so there were the these pockets of death. Because nature was keeping it in check, but then the clear cuts expanded and so that now they're like cover our entire landscape almost. And you know, all these simplified forests in the collective of our extremely vulnerable, the mountain pine beetle has always been in our landscapes.

But because we had this extensive landscape of lodgepole pine, not just from planting but from the banning of indigenous burning. From the settlers lighting fires to make way for railroads and creating the conditions for this uniform blanket of pine. And that was not interrupted by continued burning. It created this explosive situation where we lost 18 million hectares of lodgepole pine forests in British Columbia alone, 40 million across all of North America, including the US. And then this itself created a whole nother suite of problems, like so much fuel and creation of another cohort of lodgepole pine that's going to amplify and continue the cycle.

So yes, it's a cumulative effect of multiple things that have created a very volatile situation now.

Jonathan FP Rose: But you also began to then discover that in addition to this monoculture that was happening above the ground, that in healthy forest there was something amazing happening below the ground.

Suzanne Simard: Yes, so growing up in a mixed, beautiful, diverse forest and working in these monocultures. I was always interested in what was going on below ground, but what were we simplifying? What's going on below ground as well, and what is that diversity below ground like? We can't really see it with our own eyes unless we dig down and we look and so I started digging down and looking and I was building on other people's research.

Of course, I did my doctoral work in looking at this beautiful diversity below ground. Following on research that was just emerging out of Europe, really about these fungi, mycorrhizae fungi, which are symbionts with trees, all plants all over the world, except a handful of plant families have these obligate symbiosis with trees where the fungi get photosynth or sugars from the tree and they grow their fungal bodies through the soil and pick up nutrients and water and other goodies from the soil and bring them back to the tree. And it turns out that, you know, there's many fungis shared between species of trees.

Jonathan FP Rose: Underground, the fungi are connecting the roots and then passing these nutrients and water back and forth.

Suzanne Simard: Yes, so I was specifically looking at photosynthate, like carbon. And so I was looking at how carbon moved back and forth below ground between Paper Birch and Douglas Fir and Western Red Cedar, and I found that it is, it's moving back and forth between these trees. And that was a momentous discovery because although the world didn't register it as momentous, but it was momentous in my mind because, you know, until then, like for the last decades that they'd been cleansing these forests of biodiversity with the idea of they were gonna grow these, you know, very large individual trees for the mills and seeing these forests dying and then figuring out that actually they're not just competing with each other, that the strongest and the most dominant is going to win, learning that they're actually collaborating and that they're trading carbon back and forth for the good of the community. Right?

So that was momentous because it meant for me, it was like, we're going down the wrong track here. We're creating an imbalance in nature. When nature is telling us a totally different story, we've imposed our own theory on how a forest grows and it's not correct. And you know, there is a community, a forest is a community. It's not a collection of individuals.

Jonathan FP Rose: So we really imposed our own theory of society, which was promoting individualism. And just for the audience, you discovered the trading of nutrients, I believe because you put some radioactive isotopes and you can actually see it moving from tree to tree.

Suzanne Simard: Yes, I used two isotopes. I used a radioactive isotope, Carbon 14, and a stable isotope of carbon called Carbon 13. I had to use two to see if it's a back and forth thing, not just a one way transmission. And you use different tools, analytical tools, to figure out where that, the fate of that carbon, where did it go, you know how much of it went.

And so for the radioactive carbon, you can actually use auto radiography to actually take a picture of that radioactivity, which people have done. You can also use scintillation counters to count the radioactivity, which is what I did. You know, it was highly significant. How much was moving?

Jonathan FP Rose: But I presume it wasn't just constantly moving consistently. The flows must have been times to or correlated with the age of the trees, the older trees supporting younger trees, the time of season, of the year, et cetera. Right? So you unfolded a trading system. There wasn't just a automatic back and forth.

Suzanne Simard: Yes, definitely. I started trying to understand what are the driving factors, right? So what makes carbon move more in one direction than the other? I started working a lot with manipulating, if you will, and experimentally the status of the tree. So the first thing I did is I followed on David Reed's experiments, which he did and all in the laboratory where he shaded a seedling that was connected to another pine seedling by a Mycorrhizal network.

And he found that the more he shaded it, the more carbon went towards it. And so I thought, well, this is fascinating. And so I tried that in the field in my experiments. I found the same thing, right? So the more I shaded one species, the more it was moved over in this connected system by the other one. I also manipulated things like the water status with my graduate students.

If one was in drought and one was imbibed with water, water moved from the water rich seedling to the water, poor seed. So it was evidence that the evidence kept accumulating. If I had one that was more nutrient rich, it would send more nitrogen to one that was nutrient poor. And so it was becoming more evident that the more enriched tree, the one that had more, was providing to the ones that had less, which opens up a whole suite of questions, right?

Jonathan FP Rose: They're not just sharing nutrients, they're in effect sharing ideas. They're communicating their own status. They're hearing, they're receiving the communication of of each other's status, and then they're deciding to do something about it.

Suzanne Simard: Exactly.

Jonathan FP Rose: So how did you figure all this out? That there's this incredible conversation going on?

Suzanne Simard: You know, I kind of reflect on how I arrived at these things. Of course, it comes from where I grew up and I always understood the forest to be a community. That was cohesive and collaborative and competitive, but had all these incredible interactions that created that community. And then I took that idea in my mind that I grew up with, that was inside of my DNA, and I asked, how do I measure this?

And so then I used these isotopes in multiple experiments and I combined it with molecular genetic analysis of the fungi and the trees themselves with my graduate students. And those two powerful tools together, the isotopes and microsatellite genetics, enabled me to actually map out with, you know, with my students what these networks looked like, and then use isotopes to figure out what the network was doing and how it was the ecosystem distributing its carbon from one tree to another.

And so that brought to me a greater understanding of how this forest is functioning as a social network. That led to more questions, and of course I continued on this academic path. I've had 40 graduate students working on different aspects of this, piecing this story together. And then, you know, now I've discovered in working with my indigenous colleagues that this knowledge is not new at all.

Jonathan FP Rose: Right. They've known this all along, but what you have then is the forest is a community. It's sharing is communicating. It is in some cases competing too. Other work has shown that, by the way, if some insect is attacking from the east side, it'll pass a message towards the west. Protect yourselves.

Suzanne Simard: And we've done that work as well and verified that through these below ground networks as well.

Jonathan FP Rose: Perception, intentionality, compassion, connectivity, mutual support. These sure sound like consciousness to me.

Suzanne Simard: Well, it's certainly an intelligence system. It is our words that we use to describe this behavior in a forest. There are human words for how we behave as social communities ourselves, and so sometimes, you know, does the word match quite right? I'm not sure if the word match is quite right. It's certainly a good analogous word or a good descriptor, the best that we have to describe what we're seeing, and that's not just me, as you said, it's many scientists are now, you know, realizing and coming and converging on this understanding of the forest as a perceptive, responsive, deciding, has a agency, has intelligence and is very, you know, very perceptive. And is it a consciousness? It's not the same as our consciousness because we're a different species, but it certainly has a lot of agency. So it's heading in a direction which is toward health unless we screw it up.

Jonathan FP Rose: To me, it's a consciousness, but I agree about the words in English was particularly not designed for this. Level perception, but there were many indigenous cultures that were, and you've been delving more into that. Are there indigenous words that you think describe as better?

Suzanne Simard: Arutam is one that comes to mind from the Amazon. Right. It is the forest and the spirit of the forest and I've been in the Ecuadorian Amazon with achuar people and have these communications, this consciousness in the forest. And I mean, yes, there are. I am no linguist, but I hear these words in different indigenous cultures that I work with along the Pacific coast, and they, of course they do exist.

And unfortunately with colonialism, a lot of them have been forgotten or more, hopefully they're being recovered and they're different words, they're special words. They're not the same word that always used for, you know, multiple things. Like consciousness would have like maybe 10 words that would describe these kinds of communications that are going on and these behaviors.

Jonathan FP Rose: And then your work expanded beyond this beautiful system of trees to include salmon and bear.

Suzanne Simard: Yeah, so I was so fortunate, Dr. Teresa Ryan, who is of the Tsimshian Nation, and she's also a doctor in fishery science, specifically salmon science. And she sits on the joint technical committee for Chinook between Canada and the US, so she has a broad look, but she also knows the traditional stewardship practices.

Together we got a doctoral student, Allen Laroque, and we went and we followed on work that had been started in different labs in the Pacific Northwest. In universities who are looking at salmon derived nitrogen or salmon, that ends up in the forest. It's in the mosquitoes, it's in the moss, it's in the plants. It's in the trees.

And so we set out to say, How does it get there? Does it go through the soil? It must, right? Because the bears and the wolves and the eagles and will carry the fish into the forest during spawning season far into the forest, and then they eat the salmon in the forest and they leave a lot of it behind because they're after specific parts that they like.

And so we thought, okay, well if it's left on the forest floor, and then you go into these forests and there are salmon bones, right? All over the place. And so where did the salmon go? It wasn't all eaten. It decays. It seeps into the forest floor. It decays, and then it gets picked up by the roots of the trees and the plants.

And so then the way we're able to measure where it goes is that out in the ocean, salmon accumulate the heavy isotope of nitrogen because they're a top predator and it's a heavy isotope. It gets, compared to N 14, it gets left behind with each biological reaction and so therefore accumulates and that they carry a signature, then that's, you know, higher than the background level, and you can then use it as a natural tracer and see where that nitrogen from the salmon ends up. And sure enough, we discovered that the salmon changes the whole microbiome of the soil. And that, you know, the Riss pick up these salmon nutrients and then they deliver them into the tree. So that was incredible. The other thing that we've figured out is that, you know, we were looking at the effect of the salmon above and below waterfalls.

So the idea that, you know, salmon can't go above the right, they can't jump above these waterfalls, and so. In theory then we shouldn't see any salmon nutrients above the waterfalls. And sure enough, we found it above the waterfalls, and so we theorize that the way it got there is through the mycorrhizal networks, that it passes from tree to tree through the forest through these networks to basically enrich their neighbors.

Jonathan FP Rose: So it turns out that trees are carnivorous in a funny way.

Suzanne Simard: Yeah, I guess you could say that.

Jonathan FP Rose: What it's showing is that though there are no boundaries at all, elements of life, that it is all tied together in this magnificent web.

Suzanne Simard: It is all tied together.

Jonathan FP Rose: When your first major article was published on all this, they called it the wood wide web.

Suzanne Simard: Yes, My indigenous colleagues, they have all kinds of names for this big web that we live in. nə́c̓aʔmat ct means we're all connected. Awi'nakola, the land and the sea are one. Hishuk-ish-tsawalk in Nuu-Chah-Nulth means that we are all connected.

Jonathan FP Rose: The All of Life Web.

Suzanne Simard: So yes. I mean, we've known about this for a long time, but the science just validates, I guess, in a sense of all this connection.

Jonathan FP Rose: And the older trees play a special role, which you called the mother tree. So talk about that.

Suzanne Simard: I had a grad student, Kevin Beiler, who in his PhD, mapped these mycorrhizal networks in the forest. We went into Douglas Fir forests that were multi-aged. And I picked those, especially because they're self regenerating forests. The old trees shed seed and that their offspring regenerate in their understory.

And so there's many ages of trees right in the forest. And so we mapped two sister species of fungi in this forest, of which there are probably a hundred species per hectare. And. When we map these two sister species, their rop Pogon is the name of the Genuss. We found that almost all of these trees are connected together.

The ones that we found were disconnected, we probably just didn't detect the connections because our tools weren't good enough. But we found that pretty much everything is connected. But the biggest trees and the oldest trees were the most highly connected. They had the most connections with all the neighboring trees of all these different ages.

It just makes mathematical sense because they have bigger root systems. They have more photosynthate, and so there is more energy that can move through these connections and connect with the other trees. So we started to call these big old trees mother trees because you know, we started doing work with, okay, what if we put some isotope in this tree where as it go, and we started planting seedlings and seeds around them and looking at the regeneration discovered, you know that these old trees are shuttling more carbon to their offspring and especially to their kin. So there's some kin recognition that's going on. So all this evidence accumulating over all these decades of this work led us to calling them mother trees because they're the regenerative icons of the forest.

Jonathan FP Rose: Although it's a human word, it and it is anthropomorphizing the forest, but there's something about mothering that is a beautiful idea. So here we see the way of nature is really clear and with indigenous knowledge we hear it in their poetic language and their deep understanding, which led to, by the way, behavior that was very much in alignment with nature.

And now you and others had colleagues have shown the science that completely correlates with this indigenous wisdom and indigenous knowledge. We had a society that just as it viewed the forest, not as a living interconnected community, but viewed it as simply a material to be a plantation for profit making that social, economic, political worldview, we have magnified enormously and we are undermining the roots of our biological ecological connectivity and our social connectivity.

We seem to be continually isolating ourselves. So how do we take these amazing lessons from the forest and recede them within our culture?

Suzanne Simard: Yeah, that is a great question and it's probably the most important question right now because we are in a global, I mean, some people call it a global collapse and you know, there's all kinds of indications that we are in that, but there are groups happening all over the world who are working at the local level to restore their ecosystems, to say this economic growth model that simplified our ecosystems is not working for us. We as local people are impoverished and we need to rise up and be cohesive and work together and restore our ecosystems. Not just ecosystems, but you know, local economies, you know, local social networks, local hospitals, and it's happening all over the world and you can't suppress it.

And these groups are getting quite organized. You know, they have common values and they're not all the same, right? They're different all over the world. And they have to be, 'cause they have to be locally adapted. They have to be in their place and make it right to do it. Right? To do it in a good way. So this is happening and it's irrepressible.

So the theory, the selection theory that became dominant, the economic theory that became dominant is starting to change. Maybe it's starting to unravel, but it doesn't mean that it's a collapse. It means it's a reorganization. And that's how I see it, is that we're in a great period of reorganization and we still have some very destructive forces out there that

are very scary, and that's why we think that we're in collapse, that we're heading, maybe that it's inevitable.

I don't think it's inevitable. I think that there's a great deal of power in the collective all over the world, whether you're in the Amazon or the Boreal Forest, or the desert, or whatever it might be, people are rejuvenating. They're reactivating, and they're claiming back their rights and their land and their connection to the land and water.

Jonathan FP Rose: Are you seeing biodiversity measures increasing in those communities?

Suzanne Simard: The ideas are there. The goal is there, and it's a lot of work, but you know, I'm working with a number of nations on the coast. One is the Kwiakah Nation, which is a very small nation, and they're taking back their territory. They bought back all the licenses from the big companies. They said, this is ours. And it's all been logged and it's all been replanted at these monocultures, and we're going back in and we're versifying the forest and we're looking at the historical ecologies of their indigenous ways of doing things, that those legacies still exist.

The knowledge is still in there in those people. And so we're working together with them to rejuvenate these forests and it's super exciting. Because the forest responds, right? It comes back like salmonberry bounces back and the devil's club comes back, that we just need to, you know, take the oppressive forces off, open up the ways. It's like the Klamath River, when they took the dams off, it wasn't very long before the salmon returned to the Klamath. So nature is there, ready to rebound, and so yeah, it, it's happening. It's irrepressible.

Jonathan FP Rose: That's really, really nice, so you have hope.

Suzanne Simard: Yes, it gives us great hope and agency. You know, once you get your hands in the soil and once you see this irrepressible, what I call regenerative aspect of the forest or whatever you're working with, you can never unlearn that, right?

Like it gives you this eternal hope and positivity because you just see it happening. So I think it's would be as many people as possible could get out and do this, because I think having those experiences are really important in driving the change. And a lot of people don't have those opportunities, but they can create them, right?

They can create them in little ways, even by, you know, planting a tomato on your apartment deck. You know, it's something as simple as that. It's amazing how many people haven't had that opportunity or haven't done, just do that. And you watch this thing grow and you go, oh my God. It just does it right? The organization of life is so beautiful.

It's meant to be regenerative and healing. It's hard to make it not loud. And so if the world could get that message, you don't have to have a big ranch to go and do it. You can do it

yourself in your own little spot, and it is a beautiful, beautiful thing. And so as we watch our world stage play out right now.

Where we've got these, you know, autocrats coming and rising up, they create instability. They won't succeed in the long run. It's these small groups that are organizing at local levels that are saying, that does not work for us. Those groups are the ones that are going to succeed. And that's what this multi selection theory talks about.

And it makes sense when you're out in the forest.

Jonathan FP Rose: So the idea of multi-level selection is that whereas when a few individuals compete, which turns out in nature, no individuals ever compete, but anyway, that the strongest one might win. But that when groups compete, the group that has the most internal coherence, the most compassion and connectivity will outcompete.

And the idea is that if you move from the individual level to the higher group level, you see different levels of evolutionary selection. But if you keep going up, the level which you see is there's deeper and deeper relationality. And on earth, the highest level is the level of our entire climate, which is a level that, and by the way, we better get that level of cooperation, collaboration, all really together or it's gonna deselect us all the way down.

Suzanne Simard: Yeah, exactly. And that's called the Gaia theory, right? It's the biosphere is that it acts as a cooperative self-organizing super organism. Of course James Lovelock got ridiculed for this because it was during the 1960s when this natural selection individual will win theories were all taking hold and becoming so popular, and he got laughed at.

You know, now as we know more and more and more, and he modified with Lynn Margulis, that theory to say it's actually a symbiosis. It's about self-organization. And now we understand that like in groups when they're self-organized and it's working well and it's in balance, you have a very thrifty and productive system.

And now we understand that that's the case. When we started looking at the human genome and we developed these molecular tools and it was like, oh, this human is a human right. It's an individual. Now we know us. We're a consortium of a lot of individuals. We're a multi-species organism just on ourselves, and we evolved through this symbiosis, and that was a great thing that happened because then we start to understand that at higher and higher levels, like you said, all the way up to the biosphere, that these are cooperative and competitive and you know, all those interactions working together, that creates these higher levels of organization imbalance. So it's interesting to see how our thinking has evolved. And then I have great hope that that will prevail and that these islands of coherence, if you will, these groups, that local levels, that their group is gonna work for them and this group over here is gonna work for them and that these collection of all these very successful groups is what's going to create a healthy future for future generations.

Jonathan FP Rose: May it be.

Suzanne Simard: May it be so, yeah.

Jonathan FP Rose: Your research has contributed so much more to this iteration of world's culture in understanding the nature of nature. As we noted, previous cultures understood it in a different way, but ours culture has demanded a scientific understanding and your beautifully designed experiments, you and your graduate students have enlightened us and we're for really grateful for that.

Suzanne Simard: Thank you. I think that if I had one last word, it would be we need to put the spirit back into our thoughts and the way we do our work because when we just do the work from a clinical point of view, we miss most of the picture, and that's what I try to do is put my spirit into it. It's just a very important message I think, for the world, is that this is work that we do from our hearts and from our spirits, and that's where the change is gonna happen.

Jonathan FP Rose: I think that's a perfect way to end.

Jonathan FP Rose: Thank you to our guest Suzanne Simard.

The Common Good is a production of the Garrison Institute and is hosted by me, Jonathan Rose.

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It's theme music was composed by Jonathan FP Rose and performed by Jog Blues.

We look forward to being with you again soon.