

## **Cultivating Imagination: Leading Towards a Just Future**

### **Transcript for Episode 3**

#### **Knitting Together Serendipitous Connections: On Imagination and World-Building with Ann Pendleton-Jullian and John Seely Brown**

##### **Stephen Hurley:**

So today on the podcast, once again joined by Meaghan Dougherty and Gillian Judson from Simon Fraser University. They are the minds behind this podcast, *Cultivating Imagination*. And also joined today, two very special guests, John Seely Brown, who's a visiting scholar at the University of Southern California and the independent co-chairman of the Deloitte Center for the Edge. Among other things, he identifies himself as the Chief of Confusion, which I love. Also Anne Pendleton-Jullian, who's an architect, a writer, and educator, and whose work explores the interchange between architecture, landscape, culture, science, and technology within complex contexts. Those are very thin introductions to people that have very rich biographies that you'll be able to find in the show notes. John and Anne, welcome to the podcast.

##### **John Seely Brown:**

Thank you.

##### **Ann Pendleton-Jullian :**

Thank you. Great to be here.

##### **Stephen Hurley:**

Let's begin by finding out what you're doing currently, what your current roles are, and maybe how you see leadership, and some of the priorities around leadership in the course of doing that work. What are you up to now, and what are you thinking about in terms of leadership? Anne, let's begin with you.

##### **Ann Pendleton-Jullian :**

So at the moment, I am professor, full professor, at Ohio State University in the Department of Architecture, where I was also the former director, analogous to Dean, also the visiting design, special design something or other, I don't know what the official title is, at the RAND Corporation, which is a major policy think tank. And there I've been working with the Pardee RAND Graduate School of Policy. Also a fellow at ASBS Stanford, the Center for Advanced Studying and Behavioral Sciences. And have just launched a startup of my own, a nonprofit, to work on complex problems. Formerly I was at MIT for 15 years, where I kind of began my career— that may be relevant to this podcast. It's where I began to understand the restraints of insularity that any field exhibits and architecture less than others, because by nature we have to deal with structures and culture, and we deal with poetry and aesthetics, but we also deal with the environment. So it's already a rich kind of practice of multiple practices. But at MIT, that was just amplified in so many ways and in so many directions. It's also where I met John, as in JSB. And in a sense, his experiences began to catalyze in me more than teaching. And I began to write and do other work. And I was recruited to be the director at Ohio State under the auspices

of a mandate that was interested— and this was long enough ago that it was really radical— they were interested in beginning to renovate what architectural education could be. So I began to write about not only my experiences, but thinking of the future. And it's there that I had my first experience of all of the vicissitudes of leadership, and grew as a leader in situ, without mentorship, in an ad hoc way, and seeking out other great leaders along the way, that I felt had real insight as to how do you deal in changing times with organizations that are very happy with where they are? And so it was a great experience. The other major thing that's relevant is when I was brought into the RAND Corporation, their graduate school, to help completely reimagine the school. I'm not talking about the curriculum, but everything about it for the context of today, and not the context in which RAND has been operating for the past 20 years. So that was a question of a different kind of leadership, where it's not hierarchically structured. In a sense, I was behind the scenes, but had to be leading from behind the scenes, if that makes any sense. And I have been told since then that leaders of the 21st century, the great ones, will be the ones, the names that people don't know. So it was shepherding the entire organization through a reimagining process, world building, taking them to some real out of the box thinking, and then crafting that into a full model series of mechanisms, and starting the first components, including a studio that was no longer architecture, but based upon architecture skills, and was looking at creating ecologies of change for complex systems, whether it's healthcare, homelessness, or climate. So that's pretty much it.

The leadership, now that I'm engaged in, is very much entrepreneurial in nature. I mean, still, at Ohio State, I'm looked to as a leader there, and also in some other venues. But now it's different, because I'm building everything from scratch. And I'm finding it's a very different beast, shall we say.

**Stephen Hurley:**

With as busy a schedule and as busy a mandate, a list of mandates that you have, are there questions that you go to bed with at night that maybe are, I guess, still emerging for you? Are there new questions that you find yourself asking in that myriad of context?

**Ann Pendleton-Jullian :**

I think there's meta question, and then there's the kind of meso/micro questions. The meta question is, how the f do I do this? That's the meta question. And what have I gotten myself into? But more seriously, the other questions have to do with, if you're creating an entity that's a networked organization, but is asking for major engagement from all of your partners, if not time wise, at least in terms of intellectual focus, what's in it for them? And they know what's in it for them. A lot of the people I'm working with are spectacular, and the altruism of the endeavor has captivated everyone's imaginations. And one has to build that, right? The thing that captures the imagination. But on the other hand, the day to day of their other work and their other things, and as I begin to create the on ramp to pull them off of their other work. So how do you keep a sustained imagination in that group when altruism is great, but it's like you go to a great film where you come away going, yeah, we have to change the world and the climate, but it goes away. It's hard to sustain those kinds of emotional, and I mean deep emotional in the Antonio

Dimasio sense. I don't mean in the Hallmark card sense. How do you sustain those kinds of engagements? I think that's my biggest question. If you're creating a networked entity.

**Stephen Hurley:**

It's a big one. John Seeley Brown, let's turn to you: your current role, and you probably have as many contexts as Anne does that you're working in now, but tell us about some of that work.

**John Seely Brown:**

Well, I have a fair number, but not as interesting as the different contexts that Anne just went through, which is even an understatement of what she really does. I think it's kind of interesting to me because as you were asking Anne these questions, it flashed in my mind about 25 years ago, the president of MIT, who I knew fairly well, called me up and asked me to be on this review board for the school of architecture at MIT. And I said, what? But I said, you know, sure, I'll give it a try, but that's not what I do. And I went to this review sessions maybe two or three days, and in that meeting, I ended up wandering into this studio that totally captured my imagination in a whole new way to think about what learning could be, about what teaching could be, about what experiential learning could be, and it turned out to be the studio run by Anne. And so I kind of didn't leave the studio. I kind of hung out there the whole day watching things, talking to people and so on and so forth, and—

**Ann Pendleton-Jullian :**

Got me in big trouble. Got me in big trouble.

**John Seely Brown:**

But right away I realized that there are things one could do with the studio I had never dreamed about in terms of a whole new way to learn and a whole new way to open up people's, let me call it, imagination. And in a funny sort of way, I never left that studio. So I kind of hang out with Ann and doing all the things she just talked about, but way in the periphery, on the other side of the world quite often, actually. But I just find that the kinds of issues that she already brought up, the key issues that we are walking into, I think, all the time, and how to really rethink what learning could be as opposed to book learning, learning in action, where critique is everything and how critique can actually open up the imagination in useful ways and so on and so forth. My main time, of course, is quite different than that. Having run the director of Xerox Palo Alto Research Center, which brought us much of the electronics you now use today. It was a very interesting experience for me because being in that 300 person laboratory, I became aware of what was not going on as well as what was going on. And mostly they were brilliant technical investigations going on. But what was really missing is a deeper sociological understanding of what are we, what creates meaning, how do we listen within to each other, how do we learn with from each other, and how do you actually collectively learn tacit knowledge? And so those dimensions became increasingly important to me and needless to say, fostered by then hanging out in the periphery with many of the projects that Ann was working on. I've also been on various major boards of directors. 14 years at Amazon, which is kind of one of the most complex and amazing companies that has ever emerged. I left that like five years ago, but kind of living in the heart of the science and the heart of a kind of top level rethinking what leadership needs

to be has always been an interesting context to look at things. But today I've done more of a shift because one of the new little companies I'm helping to start asking the question, if you take the common good, beautifully articulated by Robert Reich, et cetera, seriously, how do we think about amplifying the common good? By helping to stitch together different points of view where people then have serendipitous encounterments and begin to see that there are connections that can weave thoughts together that they never thought about. And so there's a whole sense of there may be now new ways to use some of the most sophisticated AI technologies and Bayesian belief networks and so on, to see if we can in some ways knit together ideas that seem completely opposite to each other. But if you can create a serendipitous encounterment, you suddenly see something you never thought about before. How do you capture that? How do you amplify it? And so on and so forth. So I think that there's a very interesting use of the cutting edge AI technology, generative AI, which I've been doing a lot in, but for this purpose of the social good.

And I think that it's interesting now, given my years at Xerox Park, to see if there's a whole new use for technology that helps us be with each other and be able to knit increased meaning from and with each other. And so I think that that is turning out to be, I think, a major challenge going forward. It came out of some technology that this little company had built called Crowdsmart, saying, like, if you look at the top level of management in these corporations or leadership in general, but I'll take corporations basically, there's very little alignment of the deep beliefs that the leadership team really does have. And one of the questions is how do we start to give voice to that, help knit that together? That was the beginning of some of this technology, and we suddenly recognized that some of our ideas, the ideas inside Crowdsmart, scale, scale hugely. So usually you would think about how to bring alignment in small groups, 15, 20 people maybe, but you'd never dream of using those techniques for 1000 people. And so we found by using generative AI, there was actually a way to start to look at how do we knit these things together and using some of these ideas in brand new ways.

**Stephen Hurley:**

I want to come back to that idea and the leadership skills or qualities or attributes that are necessary to bring people together to see, I guess, the positivity in those differences. But I know Ann wanted to weigh in on some of this.

**Ann Pendleton-Jullian :**

Yes, and I'm going to start a little bit where he started and then come up to where he is, because I'm going to come back to the notion of imagination. And John's had some amazing leadership roles. And in those leadership roles, there are, I suspect and know that there is the functionality that you usually associate with leadership. But I think John's unique talent, as I've come to know him and watch him interact with others over the past 20 years, or more than 20 years, and know his stories, is that the chief of confusion is nomenclature for actually what he does do. And I tease him that he's a badger, because what he'll do is he'll have a conversation with somebody, and in that conversation, see something and start badgering them that they have to write about it, or let's just say, get it out into the world. He always talks about writing, but it's getting it out into the world. And why this is important is that in addition to all the more formal leadership stuff,

is he has over his life— and we had a long conversation the other day about one's contribution to the world as one gets to that place in one's life, right? His contribution is the way that he's launched quite a few people, either explicitly or without them knowing it, by seeing something— an idea they had, let's call it that. Something a person has imagined and then sees in it, or imagines what it could be, given the context of today and where the world is coming. So this is really interesting. He was talking because I was beginning to think about— well, and we define imagination very clearly in the book, that it's very different than creativity. It's usually a micro nanosecond. It's building images off of image banks. And how do you get there? And then we talk about the cognitive and the neurological aspects of it. But the notion that a person might have an idea, but that another person might imagine in that idea, not just see its value, but imagine what its value could be when extended, that's a unique talent, and that's what I would say is perhaps John Seely Brown's greatest talent, and working with him closely. And that's why often this idea of the power of two. So one person might have a quick thing come to the fore, and then another person can see, because they know each other so well, what that might do. And then it's a back and forth of a kind of a volley of imagination, if you will. So that's really interesting. And then how do you begin to expand that and cultivate that kind of thing in a larger group? And that's the harder thing to do. And I don't think you can do it with AI. I don't think you can do it, because what you're doing is you're playing into personal memory banks. Whether it's one person, two people, 50 people. 50 people have certain experiences that are common, but even how they've perceived and assimilated those experiences have been altered by each one's own imagination and experience. And we talk about that in the book. So this idea, and I use AI generatively quite a bit, and it becomes interesting only when it's playing the role of that other person and bringing things to the fore that I never would have thought of. And then my imagination takes them further. And when I worked with RAND, you know 500 people, it was never anything where you could just reduce it to the lowest common denominator. You know, AI, they're probability models. Right? This was about finding the anomalies that stand out from the pattern. Anyways, that's my point. I think the imagination is a very special thing and should not be lumped in with certain other functionality, like brainstorming or taking the temperature of a room or something like that. Right? And so when you talk about imagination, how is your concept of imagination different than maybe other people who actually do work in the area of imagination and creativity? What are some of the defining features of the way you see imagination? Well, it works off of the way other people talk about imagination, specifically the neurocognitive scientists. Where it gets different is where we talk about multiple imaginations, and that it's a spectrum of activity, and that it operates everywhere from perception through all the stages of reasoning. This most simplistic reasoning, which is deductive into inductive and then abductive, where in abductive reasoning, you really need to use the— and then how you experiment with things. And that sponsors the imagination all the way to the kind of free play that we're used to. But it builds very much on the notion, on the kind of— and Antonio Dimasio probably defines it the best is that it is unlike creativity, it doesn't sit in culture. Creativity, you have to bring something into the world, and then it's creative, and it's in relationship to culture. The imagination is a nanosecond. It's this micro event or experience that happens in your brain when certain synapses come together that don't belong to a trodden path of synapses. In other words, they're not part of the front, the way you normally think. So you might see something, and all of a sudden it pulls images. And those images aren't only visual, they can be auditory.

And all of a sudden there's these weird little pathways that go through your brain, and they bring things to the surface, and those surfaces, those things are experiences. It's your bank, it's your memory bank. But even that. So two people can see the same event, the exact same event. Stand on the exact same corner and see that event. But how they assimilate it, like, what does this mean? Is already worked on by their own experiences and by their imagination, which is why often first person accounts in a trial, they actually negate each other, not because of any ideologies, but just because the things— I mean, we all have relationships with friends or partners where at some point you're having a fight or an argument, and all of a sudden you track back to an event and you go, but I lived that event. That's not how I saw it. So that's how we see imagination. It's a whole spectrum of activity. And what's interesting, when we talk about the imagination, it was William James who said, there isn't one imagination. There are many. When we talk about the whole spectrum, most people go, oh, I'm here on the spectrum. And our point is, no, we all use it, that nanosecond activity all through our lives. It's just that most people have the kind of imagination that's at the further extreme side of the spectrum, which we just say is art. Right? Most of the muscles for that imagination have atrophied because of the way our education system prioritizes reasoning.

**Stephen Hurley:**

That's another topic for another day, an important topic. John, I'm wondering, given that description and that definition, if you will, of imagination, how do you take that and work with people? It's one thing to write about, it's one thing to talk about it, but how do you actually put that into action with the people that you work with to solve some of the problems that you've already identified?

**John Seely Brown:**

I love the way Ann built on this, because I think it was a set of critical points. To me. First of all, the catch in leadership, or the catch in interacting with folks in general, is how do you listen with generosity? And then how do you listen, once you listen deeply, generously, how do you listen generatively? How do you take what just got said and then build on what triggered in you, or you figured out what triggered the other person and so on and so forth? So it's kind of like knitting together a serendipitous connection that connects two ideas or lets one idea stimulate another idea. And so that sense of how do you really do that? And today, generous listening is not exactly prevalent everywhere, especially in even the academies, the universities. You listen in silos. And if you're not from that silo, you shut down. But even once you listen generously, the real catch is how do you listen and think generatively? How do you then build on that almost serendipitous connection in a way that might be useful in terms of what Ann was just talking about in terms of either myself or the other person? And so there's a sense of this wonderful process spiraling up almost unconsciously in a way, because these things are being triggered, and it's kind of the excitement of being able to be generative on both sides of the equation that turns out to be almost a new melting spot. But it's a melting spot between often two people to begin with.

**Stephen Hurley:**

I wanted to turn it over to Meaghan and Gillian, who I know are waiting with input, feedback, questions. Gillian, over to you.

**Gillian Judson:**

This is a really fascinating conversation. I super appreciate it. I think this question is for John, although it comes from something that Ann, you were saying, that badgering activity, that chief of confusion role that you've noticed John play in his leadership and have described it, is very, very helpful and effective. It reminds me of something Dr. Sean Blankensop was speaking of in another episode about sort of being a dissonator. And so my question is, when you're noticing the potential for an idea, you're noticing that imaginative leaning in from somebody else. What are the tools that you then use? John, like, how do you use imagination? What tools of imagination, practically, do you use to sort of cultivate that imaginative idea? In the other.

**John Seely Brown:**

I mean, again, it comes back to those two properties. How did this thing start out generously, and then how did that lead either in me or the other person or both of us together? Something that starts to spiral up. But when it starts to spiral up, it's also critical to have a deep willingness to listen to what underlies that spiral. Otherwise, as Ann knows well, it becomes badgering in a non productive way.

**Gillian Judson:**

I love the idea of the generous listening, and I'm curious about the generative listening because I'm sure in your many years of learning and reading, I've read this distinction between when you're listening to the person and when you're not listening because you're thinking about something else. But I hear what you're saying about hearing them in a way that is also then leading to growth. I'm just really thinking about that. It's not really a question. It's more of a comment. I'm going to hand it over to Meaghan, and I appreciate that. I'm going to keep chewing on this generosity/generativity piece.

**Meaghan Dougherty:**

Thanks. There's just so much to pull out of this. Both of your contributions are just so rich. But I love this metaphor of knitting together that John keeps coming back to. And when you're talking about this micro event in the brain, the connections coming together that don't normally come together in terms of neurobiology, I see that as knitting together on a very specific scale compared to when John's talking about stitching together these opposite ideas and creating these serendipitous, kind of generative moments. I love that. And I was wondering, actually, how critique fits into that. John mentioned critique as a cornerstone earlier, and I love critique. I love the questions about critique, affirmative critique, and whether critique might be running its course. So I'm curious about critique as a potential tool to create these serendipitous encounters.

**John Seely Brown:**

Yes. Let's direct that to Ann initially, because my understanding of critique and the power of it came from being around her when she was doing that. And I then began to realize just the nuance that goes into this kind of phenomenon. So you want to pick it up from there, Ann?

**Ann Pendleton-Jullian :**

Sure. Yeah. So just to give it a little bit of context relative to leadership and imagination is when you teach an architectural studio, which I've done for 35 years, and I've done the beginners, right? So beginners in a graduate program, people who come in very, very smart at MIT and think they know how to problem solve, which is very different than trying to get at imaginative constructs that are responsible to the problem, as opposed to problem solving, which is very different. How do you get out-of-the-box thinking? And I've also done the end of the curriculum, which is thesis, where you're now trying to get an individual to not respond imaginatively to a brief that's been posited for them, but trying to get them to actually posit their own ideas about the world. So using their imagination for that. And so when you're leading architectural studios, critique is one of the tools. There are seven that we go through in *Design Unbound*. Each one has its own chapter. Critique is very foundational to it, though. When I was working at RAND, I was with people that were not practiced or initiated into any of this way of working. Because the interesting thing about critique is that it's not about problem solving, it's about suspending the problem enough. You still have to do all your research. You have to be responsible to understand what the problem is. But suspending the— giving yourself permission to deviate, to go rogue and come up with things from the outside, if it were then critique. So you start by starting. You don't go and say, okay, where can I leverage this? And how do I do this, and you do all the research to put information in, and then you begin to operate. And I can get back to the notion of catalyzing that activity. You begin to imagine, to do things, to play, to just experiment, to just do stuff. And then critique is the way that you look at what you've got, and you don't say, oh, this is good or bad, but you begin to look at it in the context of the problem, but in the context of your position relative to the problem. Before a student is mature, the director of the studio offers that critique. And I'm talking about in a pure sense, I'm not talking about the kind of egotistical directors or architects that only talk about how they do things. I'm talking about the studio critics that are after the student's learning, and then they have to do a certain psychoanalysis. What is the student? Where are they coming from? What are they trying to do? How are they approaching this problem? So that's really how critique works. You can't do critique without starting— It's different than criticism, and criticism is usually looking at it like this is good or bad relative to what other people have done and the context of how other people think about the problem. That's a part of critique. But the whole point of critique is to help the person or group move forward in a productive way and not in a way that just honors norms. So that's part of it. But catalyzing the imagination first, especially when the muscle has atrophied, is its own art. And there are other tools for that.

**John Seely Brown:**

There's so much subtlety and nuance to what Ann just went through that I think it's so easy to miss the real texture that starts to play out here in a way that becomes catalytic. And I think that I'm almost getting to the stage now, thinking, like, does it pay to hire anybody except an architect who's been through this kind of training? But there's a certain way of being that I think

is so critical here as we march into the problems of today, which are so hard to get people to kind of knit things together.

**Stephen Hurley:**

And, Gillian, I'm wondering how everything we've heard this morning so far bumps up against the work that you've been doing with Kieran Egan on imagination.

**Gillian Judson:**

Yeah. So Kieran Egan's notion of cognitive tools, Vygotsky's idea that cognitive tools are these sort of cultural inventions, the stories, the mental images, the rhythms, the patterns, all of these good ways of thinking that have emerged in different cultures are tools that in fact engage and grow imagination. And I'm just reminded again and again, knitting things together, like the metaphorical nature of our communication as humans. I guess my question would be just even picking a couple vivid imagery, story, or metaphor themselves. How do you employ those when you're communicating with people in your organizations, how do you employ those to cultivate imagination specifically? Do you have any thoughts on that?

**John Seely Brown:**

Well, I think it depends critically on how well the other person feels that they have been heard by you and the nuances of that. And then are there kind of strings that are left dangling that can be woven together to construct potentially a shift that brings two into more of alignment. So I think that there's the art of listening to what's not being said as opposed to what is being said in a kind of paradoxical way.

**Gillian Judson:**

I absolutely agree there. And I think actually, paradox and contrast and anomalies, they're also things that ignite the imagination, the seeing the familiar as strange, for example. So pointing out those silences are absolutely ways in which we can cultivate, depending on our— If we're thinking about imagination as a muscle, then we're working the muscle. We like to think about imagination as soil. So are we cultivating it by pointing out those missing pieces, the cracks, the breaks, the anomalies, et cetera? But as you say, all based on solid listening, trust, and those pieces of relational leadership. Thank you. I'm just writing notes like mad here.

**Ann Pendleton-Jullian:**

Yeah. So taking your soil metaphor, I like that, because immediately the vision that came to my mind when you said soil was not the soil, but the roots, the rhizomic nature of root structure. And now we know the way that bacteria and the mushroom and the things that grow through the soil to make a single organism out of this whole forest or whatever, because the tools that you're talking about, and there are lots more tools. When you approach any student, different things work. And when you approach a group, different things work. So it's really great to list tools and have a tool set in your belt, but the thing is really context dependent, and those tools have to be entangled. That's why I love the soil. I immediately went to rhizomes. When you said soil, I went to the roots. That's the image that popped up into my head. Part of the issue is that we are so trained in the Enlightenment way of thinking, which is that you can pull things apart, you can

create bullet points, you can make tools that you pull out of your bag, and there are amazing books that do this, and sometimes I'll be in a facilitated event and somebody will come up with something from their playbook. And I'm like, oh, I never thought of that, which is really cool. But ultimately, they have to be a whole bunch that work together when necessary. It's more like surfing when you're working with a group. It's really like surfing today as opposed to 20 years ago, when you really don't know what the wave is going to do and what does it need? I remember being at RAND, and we were working with an amazing group, including the president was in that group, and we were doing world building exercises, and we'd gotten to a pretty sophisticated place. And then they were stuck in this is what the future, a new school would look like in the future. And their list was so conventional. And so I stopped the exercise and I said, this is great, which is true. This is fantastic. This is whatever. We can do two things now. We can either go home early or you can give me the Sci-Fi version of this. Right? And it was amazing because all that group needed, and I didn't know if it was going to work, was permission to be told they'd done their homework. And now permission to do what? To build a little Sci-Fi story, which they hadn't done before, but that wouldn't work in other environments. So this entanglement of tools, I think, is really critical. And there's so many ways to catalyze the imagination, the metaphor, stories, these are literary devices. So there are other devices that are ways that are more auditory, even more musical, or devices that create noise. So the brain shuts down to context and the interiority of it emerges. So it's a really cool thing. It's all very different

**John Seely Brown:**

And becoming increasingly important, I would say.

**Meaghan Dougherty:**

Absolutely, yeah. Thank you, Ann. I love that idea of the Sci-Fi– giving permission for the Sci-Fi version of things. And I think my mind was going in the same direction as you were speaking. John also spoke earlier about moving past the restraints of insularity and thinking through the future. So I'm hoping each of you could talk a little bit about how can we engage in this world building towards kind of social and eco justice in these very challenging times? I don't know. John, did you want to start?

**John Seely Brown:**

Well, no, I was going to say, let's get back to exactly kind of the beautiful work that Ann has done in really trying to expand the tools of world building. And why now? That is so important.

**Ann Pendleton-Jullian :**

Oh, thanks. Thanks. Well, there's two parts. One is using "world building lite" which is thinking: How do we begin to think about the future more constructively? The other is world building as a rigorous practice, as I was lucky enough and fortunate enough to help Alex McDowell, who does a lot of world building for many different directors, most notably Minority Report, where they were using the world building methodology, helping him canonize what he does to understand how do you actually– But it's hard because I think we just need a lot of people working on this, just doing whatever they do best, but with humility, because the biggest– So brilliant people get

together all the time. And some of these events, and I go to them and John does as well, are heavily funded by major foundations. They're putting a lot of money in. And in the end it's tremendous brains coming together, still just wrestling with what the problem is. Right? And this is why I talk about humility. If that's what you're doing and you're clear about that, and that it's not a question of, Well, but now we are the ones that are going to come up with the answer. We have the answer, we just have to build this, right? So who wants to build it? And then nobody does. So I think it's the notion of lots of people doing lots of experiments and having the humility to understand where they sit. Are they helping to unpack? Is it the forensics of the problem they're deploying their imagination on? And are they even using their imagination? Or are they doing good scholarship? And that's really important too. Is it scholarship? Is it imagining? Is it the forensics? Is it reframing? Or is it coming up with kind of multiple solutions, understanding when they're only tactical? And how do you begin to... We have to think systems, right? We have to think complex systems. So it's not going to be one person. There are some of us that try to orchestrate all of this together, to come out at the end with something that's novel in a productive way.

**John Seely Brown:**

I think also that it's interesting to think about, we can either go back to some original indigenous type thinking and taking nature much more seriously as a true partnership of us and vice versa, or how do we think about biosymmetry or biomimicry? And it's surprising if you actually step back and you start thinking about looking for different forms of biomimicry. It's such a mind expanding thought that you begin to realize, oh my God, nobody's ever thought about this kind of stuff. It's been around for hundreds, if not thousands of years. And it's interesting to see how the Weiss Institute at Harvard started taking seriously bioinspired engineering, and how that led to just incredible sets of breakthroughs as a new way to think about stuff that we live with all the time.

**Ann Pendleton-Jullian :**

Well, and the great thing about biomimicry is that it's a system, right? It's not one little thing. It's not like, oh, let's change the material on this building. Biomimicry, which, you know, it's practice, right, is looking at how something operates in its system and contributes to its system. And I think that's really important. Just as the notion of the Indigenous. We wrote a paper, John and I, called "In Search of Ontologies of Entanglement." And the thing that we took away that was a jumping off point for what we might do next is how do we not look to other things through our Western lenses? But can we craft, and we call it a quadri-epistemological space, can we craft a space in which the knowledge that is part of the kind of modern Western way of thinking—reductionism, science, really important—the knowledge from Indigenous, which are not homogeneous, the knowledge from Western systems, and the knowledge from complex systems, right? Can you begin to craft a space of equality, where those four different systems of knowledge and ways of knowing exist? And then if you take it a step further, each of those systems and ways of knowing, and what you know and why you know it, right, are attached to how you see the world. And that's where the word ontology comes in. And some of these systems start through entanglement. The Indigenous don't separate out. Biomimicry is a science that doesn't separate things. And so how can you begin to move towards this kind of productive

entanglement? But it starts with accepting those four spaces of knowledge as equivalent and seeing what happens from there.

**Stephen Hurley:**

So it's been fascinating listening to both of you in conversation with each other and with us. This has been a very imaginative conversation for me. In a final real question, and Ann, I wanted to start with you in doing all of this work and being entangled and immersed in all of this. What gives you hope at the end of the day? What gives you hope to carry on and to imagine a better future?

**Ann Pendleton-Jullian :**

My hope now is more qualified than it was 15 years ago, because I think we've got three existential problems that together may swamp us, but ultimately, I think the human brain is amazing. I think there's more positive... if you look at individuals and if you look at small tribes, cultures, communities, people trying to do better, there's so much amazing work. But we've become really big and complex in terms of the human population and the kind of tipping point issue— I never saw a tipping point that we might be looking at tipping points in the future the way I see it now. When one is agnostic to scale from the small to the big, when you look at the big and you go, oh, what the f is going on? And then you find the small things that are making changes. So I think it's really critical to always be agnostic to scale. You don't have to do things, always big. Sometimes small things don't make a difference. And look for those spots and try to collect a whole bunch of bright spots and brilliant people and put them together. I'm very interested in how do we make more productive all of the amazing experiments and thought that's going on, that just doesn't come together because it's working in different corners. And often the hubris. I'm x organization and we do x, and therefore I'm not going to go there.

**John Seely Brown:**

Talking about that as well, there's kind of the beginning to recognize— the recognition that systems are embedded in systems that are embedded in systems. So you got the entanglement of systems at multiple levels. And when you start to realize that, you're much more careful in how you try to step back from a situation and say, this is the message, I think that these kind of recursive embeddings, which nature has really figured out how to exploit to all of our advantages, I think we have a lot to learn from what is around us. I mean, it's so kind of curious. How do you think about participating with nature as just a simple step forward and how much of that change, how you represent things and so on. And I see that coming up all the time in interesting ways with the types of projects that you do, Ann.

**Ann Pendleton-Jullian :**

Back to hope just real quickly. The issue is that there's this notion of extreme. So if you have existential risk, AI, climate, democracy, right? These are also moments. 15 years ago, we would talk about these things, and not only would we get blank stares, but people would like, shuffle you out of the room really quickly. So when you hit an extreme situation, there is an opening for not just the horror of the extreme, but to begin to move, to say, okay, where's the opportunity in this? No one really cared 15 years ago, ten years ago. So I think AI is a real existential risk, but

it's really powerful too. So how it can begin to register, really look at climate and look at it as a system. So I think that's my hope, Stephen. If we can understand not either/or, but if we can all get to a place where it's a both/and mitigate the bad side and begin to really work more in: How do we work with opportunities?

**John Seely Brown:**

The both/and has a lot to do with really understanding what's the essence of a complexity science.

**Stephen Hurley:**

We need more improv theater.

**Ann Pendleton-Jullian :**

Yes, and we need more. 5, 6,7, 8,9,10, 11-year-olds going and teaching the adults how to act.

**John Seely Brown:**

If you go back to learning K through twelve, whatever you want to go, or forever, there's a certain sense that we tend to think about learning broken down as to what Homo sapien is. Humankind is knower. Sometimes we branch out to say, oh, no, let's add to that Home faber, "man as maker". But yet the real key to much of what we've been saying here has an element of home ludens, "man as player". Humankind is player. How do you play with something? How do you play with it in a way to become part of it and understand it and look at that in new ways and so on and so forth. And I think that the role of the importance of Homo ludens as a stronger component of our way we've approached learning will end up making a big difference here, too.

**Ann Pendleton-Jullian :**

Yeah. And we've put forth the notion that the 21st century ontology is that triangle. How do you get knowledge through knowledge systems? How do you get knowledge through making and experience? And how do you build experiment knowledge through playing?

**Stephen Hurley:**

Amen to that. Well, thank you both for working through so much of this with us. We really appreciate your insights, your wisdom, your experience and spending time with us today.