

SCIENCE OF THE NOOSPHERE

Kevin Kelly

with

David Sloan Wilson

David Sloan Wilson: Well, Kevin, I'm so happy to be talking with you after freshly reading your book, "What Technology Wants," not your most recent book, but perhaps the one that is most germane to our conversation, so welcome.

Kevin Kelly: Well, it's a real pleasure being here.

DSW: We actually first met at a workshop sponsored by the Kacyra Foundation, now Human Energy, which is now funding this series of conversations called The Science of the Noosphere. That's all based on Pierre Teilhard de Chardin, who you don't really cite in your book, but your view is very Teilhardian and because it's all about technology, which you interpret very broadly as you should, and which of course is expanding to this worldwide something and you provocatively title your book, "What Technology Wants," as if it's some kind of being with wants that in some ways we need to serve, which is kind of scary unless you elaborate on it, which you do of course, but I wanted to begin with some passages that are very Teilhardian just to ground ourselves here. A couple of passages I have.

So one thing you write, and Teilhard of course had this huge arc. He described everything from the planet earth before life, and then the origin of the biosphere and then this noosphere that he talked about. So you write ... this by the way is on page 355, "As the undifferentiated energy at the big bang is cooled by the expanding space of the universe, it coalesces into measurable entities, and over time, the particle is condensed into atoms. Further expansion and cooling allows complex molecules to form, which self-assemble into self-reproducing entities. With each tick of the clock, increasing complexity is added to these embryonic organisms, increasing the speed at which they change. As evolution evolves, Teilhard is beaming at you from above right now, it keeps piling on different ways to adapt and learn until eventually the minds of animals are caught in self-awareness."

"This self-awareness thinks up more minds and together a universe of minds transcends all previous limits. The destiny of this collective mind is to expand imagination in all directions until it is no longer solitary but reflects the infinite."

So, that is channeling Teilhard even if ... I don't know, should I read another? Yeah, let me read just one more. We've got time. "Look at what's coming. Technology is stitching together all the minds of the living, wrapping the planet in a vibrating cloak of electronic nerves, entire continents of machines conversing with one another. The whole aggregation watching itself through a million cameras posted daily. How can this not stir that organ in us that is sensitive to something larger than ourselves?" So again, Teilhard is just beaming from above. By the way, you're a beautiful writer, if you will allow me to compliment you. Really nice.

You credit one of your editors in helping you out but I think this was a real pleasure to read, especially at the beginning, Kevin, because we're the same age, I'm just a couple years older than you and when you recounted your life, starting out as like a barefoot boy, traveling in Asia and then, a bicycle 5,000 miles and then homesteading, all the way up until like your late 20s. Then, the astonishing thing is now we're like in the late 1970s or the early 1980s, and it's then that the Internet age began and we were adults when it began. And of course, I have my own memories of my first Apple Two and that kind of thing. I mean, it's so astonishing to just note the transformation in about a third of a person's lifetime, as this all has broken upon us. So, I don't know if you want to reflect upon that before we continue.

KK: You mentioned the kind of, the cultural eras that we grew up or passed through anyway, in kind of the hippie lifestyle. For me, that transformation was a movement from being kind of almost unreflectively anti-technology. The hippie was sort of the embracing of the natural and keeping the mechanical world at a distance. For me, the great change in my life was coming to see that mechanical world as inherently of the same nature as the natural world, meaning that the distinction between faded and blurred to the point where I call the technology, the seventh kingdom of life and this sort of awareness that all the things that we hold dear about the natural world and the organic actually has simply been accelerated by the Technium and by the technology and that we can think of them together.

So the vision, this kind of big vision you give, the Teilhardian vision of this noosphere, for me, it's important that it includes Gaia. That includes the natural world. It's not separate from it, but it's an extension and acceleration of it. I think that was sort of the main point of my first book called, "Out of Control," which was that there's a kind of a false distinction between the made and the born, is how I would put it. The made and the born are really the same. So, when I look at the kinds of things going on right now with the Internet and stuff, I see it in a very organic way. I see it as kind of the natural progression of self-organizing force that flows through the entire universe, starting at the big bang.

DSW: Indeed, you do. Actually, I like to make a connection with my world of evolutionary science and show how much the recent developments are along the same lines. So, my pitch often is that, for all of the wonderful things, evolutionary theory did in the 20th century, it became very, very gene centric as if the only kind of evolution is genetic evolution, and it wasn't until that time, the same time that Apple Two came around that evolutionary thinkers started to go back to basics, and think of Darwinian evolution as any process that combines the three ingredients of variation, selection and replication. Only then did the study of human cultural evolution, any kind of cultural evolution, again, that was 50 years ago or 40 years ago and there's been actually the same kind of advances that there have been in technology, you might say.

One of the things that means is when you think hard about cultural evolution, it has to include symbolic thought. When we think about humans, we have to think about them as a very highly cooperative unit, why, because of moral systems. One great thing you do in your book is you talk about law as a form of technology, why not? I mean, it's not mechanical but what is it, but a series of rules and so on. As for law, so also our basic moral psychology. Before law, before formal law, there were groups of people with norms that established what we could do and what we could not do, were enforced by punishment. So, let's think about that as technology too and there you get your seamless continuity, which I know that you're driving towards. Seamless continuity between biological evolution and human evolution and technology evolution.

KK: Exactly, exactly. Yeah. So, I define technology in the broadest sense as anything that's basically produced by a brain. So calendars, laws, code, libraries, social institutions, the week. These are all technologies and by the way, so is a beaver dam, so is a bird nest. So, my vision is that there is this force in the universe that consumes entropy to generate more complexity, and I call it exotropy and that works through life and it's water based, it's wet, it's tissue based, and it invents brains, which then allow it to invent things that are dry and made of other materials and eventually it will make brains that can make other things, so really expand in the future. So it's moving this self-organizing force from the most remarkable molecule in the universe, which is DNA, okay? DNA had just the right amount of structure and flexibility to not just allow all the things to be made from one set of molecules, but to self-organize itself. That's the remarkable aspect of DNA.

So, everything went through DNA, and I suspect that most of life elsewhere in the galaxies are going to be DNA-ish like because there are so few molecules that will be able to not just have all that variety, but self-assemble. Once we could push that force through this DNA, it then can expand throughout the

universe into other realms through the mechanism of minds and then the universe will be populated with many more forms of complexity, many more opportunities and possibilities.

So the one difference, I would say maybe upfront between maybe my vision and my very rudimentary understanding of Chardin because I couldn't even get through his one book. I read some of the pertinent passages, but it was just not really connecting with me. My understanding is that he has this idea of the omega point, which is that things kind of converge universally back to this omega point.

For me, the vision is the opposite. I see a radiation outward. I see that there's not a destiny that we're headed to with this arc, but that there's directions and I think there's a false image of evolution as kind of climbing a ladder when, if you actually get a map of evolution on this planet, it's a radial spoke going out outward. The center is the first cell and then outward are all the other cells. So today there's a ring after three and a half billion years, there's a ring and every single organism on this planet is equally evolved. The starfish and the cockroach are as evolved as we are. So we're radiating outward and that radiation outward is the image that I have of the arc, and it's not converging into this endpoint of the omega point.

DSW: Well, yeah, that's true and you're so spot on with respect to no modern evolutionist thinks of evolution as a ladder or progressive or any of that. I think Teilhard's concept of coalescence ... so, I mean, he knew that that evolution radiates outward and what he thought was distinctively human, which is actually not the case is this ... sometimes it coalesces previously different species, coalesce into something. For example, the nucleated cell is a mutualistic assemblage of bacteria. So, that's diversity becoming unity.

KK: And it happens a lot, and that collaboration, the coalescent collaboration, symbiosis. That's a huge force.

DSW: And the issue at stake is whether that could take place at a global scale, in which case this global thing which is going to happen in any case becomes a good global thing, a mutualistic global thing, a global thing that works for all, as opposed to a global thing, which would be morally horrible from a human standpoint.

KK: Yeah, so let's talk about that, global thing. So I once do a little four by four matrix and let's see if I can reconstruct it. There's four quadrants. The four quadrants ... The two axes, one was the number of species another one was the number of minds. So one quadrant is that there's one species and one mind. Okay. So it's like the Borg or something, right. So, all humans together and we kind of meld into a single super mind. Then there's one species and many minds, which is sort of, what we have now, so you can kind of continue that. The other one is many species and many minds and that's the vision that I am for projecting for the world of AI and maybe even humans speciate as well. So, we speciate, and we still have our own minds. Then, there's the many species, one mind, where we, again have many different kinds of individual differences, but then we also connect together into a single organism at the mental level.

So that's one way to kind of parse that future thing, is do we remain one species or do we become many species? Do we maintain individual minds or do we kind of become one mind? So, I see four kind of possible quadrants in that.

DSW: Yeah and again ... by the way, the purpose of this is not to validate each and every thing that Teilhard ever said. So, that's not the point at all. He did make a big point about saying that the global brain is a brain of brains and that there the need for individual autonomy, basically for a form of choice and mentality at the individual level. He called that pearl without price. He didn't want a borg-like society. I think it's possible, in fact, it's even useful at this point, Kevin, to recast this in very ... in more practical and prosaic terms. And I'm very influenced by Elinor Ostrom. She, and her school had a concept

of polycentric governance, which merely said, this ... You're familiar with it, I think, but here's a little summary version.

Number one, life consists of many spheres of activity. Number two, each sphere has an optimal scale. Number three, good governance requires finding the optimal scale for each sphere of activity and appropriately coordinating among the scales. So if you think that—very prosaic—forget about the omega point and the Noosphere, any of that. What it says is that every one of those spheres of activity, which often the optimal scale is the small scale, but everyone is a decision making unit. Everyone requires cooperation. Everyone requires decisions as to what to do in order to accomplish its particular objective and we can add sometimes that sphere of activity is global.

So, therefore we must have the capacity, in addition to operating at lower scales, we must have the capacity to cooperate and make decisions at the global scale.

KK: Right. Exactly. Yeah. It's inevitable and...

DSW: It's not inevitable that it will happen. In fact, it's not happening. I mean, so it's not inevitable, but it needs to happen. It's clear that it needs to happen.

KK: Right . It actually is happening, but it may not be happening in the optimal way. It's happening because it cannot not happen. In other words, even if we don't deliberately build ways to manage this, there will be emergent attempts to do it. So, our choice is whether to do it deliberately or to do it in an ad hoc manner and it's much better to try and do it deliberately with engineering. So the challenge of course, is that governing at the global level is—I mean, we have so much difficulty governing even at say, national levels, that it's really, really hard, even for me, the eternal technological optimist, to see how we can have a system of global governance where individuals feel like they have agency or in fact, would have some agency.

I don't think it's impossible. I really believe that it's possible but I think it's going to require tremendous experiments which will fail and tremendous imagination—of imagining what that might look like. And believe it or not, I think some of the enthusiasm that the crypto bros have now is because they're imagining some of these technologies as being helpful in trying to make some kind of global governance that would work for most people. So I'm very excited to explore what those forms might be. Because you're absolutely right that we have global problems that need global solutions, and that requires global coordination and collaboration and governance.

That's the scale, that's inescapable, that we can't avoid heading into that global thing, but all the models that we have of how to do that are all models that we reject in a certain sense. It's like big brother. It's the black helicopters. They're all scary images. No one has really put forward a beautiful story of how the Star Trek Federation actually works.

DSW: We're on the same page there, but I actually do think that story is available, and isn't that good news. Anyhow, so let's head in that direction. I have a series of steps I want to take this conversation through, but we can meander at any point.

KK: Well, let me know what the steps are. I want to cooperate but I don't know where you're going.

DSW: So, step two is that when we try to tell this kind of grand story, and especially when we bring in evolution, as we want to do, of course, it ends up being a very macro evolutionary story. I mean, we really talk about the things that take place over millions and millions of years, and I think that that's so common. I mean, Carl Sagan who you quote here, we are star stuff pondering the stars. So, we feel impelled to go all the way back to the big bang and you have lovely material here on such things as the evolution of eyes and other things and convergent evolution. We're really talking about evolution over very large scales. So here's a passage:

“What I hope I have shown in this book is that the single thread of self-generation ties the cosmos, the bios and the technos, that's what we're trying to do. Tell some narrative that ties together, the cosmos, the bios and the technos together into one creation. Life is less a miracle than a necessity for matter and energy. The Technium is less an adversary to life than its extension. Humans are not the culmination of this trajectory, but an intermediary, smack in the middle between the born and the made. For several thousand years, humans have looked at the organic world, the world of the living for clues about the nature of creation and even of a creation, creator.”

Okay, so a macro evolutionary story, and this is of course important and exalting. Now, my next step is actually what we need is a micro evolutionary story.

The micro evolutionary story in my experience is lacking for the most part in these narratives and you provide it in a very specific way, when you write about the Amish. So now, I want to talk a little bit, especially for the benefits of our audience is why it is that in a book on technology, you include what anyone would think is technologically backward people, and maybe I should just have you talk about why the Amish looms large, even in terms of your experience, because I loved it when you said, when you were in your bicycle phase of your life, you bicycled 5,000 miles and the high point for you was to glide through the Amish countryside.

So you're enormously attracted to the Amish and of course. I mean, you have beautiful things to say about the Amish and so, back to you and then, I'll tell you why I think this is ... says something very important about microevolution.

KK: So I became really interested in the Amish because of the way that they were handling technology, and if you have exposure to the Amish, one thing that is kind of quickly evident is that it varies. Their adoption, their relationship with technology varies tremendously and there seemed to be a certain level of sanity about it. So, the question I went to the Amish in my research was how do they decide which technologies are appropriate for them? The first question of course is that they actually are deciding, and it turns out that actually individuals, modern Americans decide about technology. There is just so much available that actually people are deciding which ones to adopt and not, but they don't know that they're doing it and they don't really have kind of coherent criteria.

So that was the first thing that the Amish had, and I was curious about, is they seemed to have from the outside a coherent criteria about what they were using and what they weren't. So I wanted to know more about it. So I hung around them. I read a lot. I talked to the experts who studied it. I went to visit them many times. I stayed with them, went to church with them and I was constantly kind of seeing how day to day they made these decisions. So the first myth about the Amish is that they are anti-technology and that was blown out immediately because I would meet these guys and they were as nerdy as you could possibly be and still be dressed in 18th century gear. So they were showing off their workshops, which had what they called Amish electricity.

Amish electricity is pneumatics, so they have a big stinky diesel generator, burning diesel oil that makes pressurized air, they send through pipes to their barn, to their workshop and to their home and they have converted appliances like a blender or a washing machine to run off of air power. This is instead of being connected to electrical. And they have these switches, pneumatic switches and all kinds of crazy things to replicate electricity. So that's a lot of trouble to go through, to avoid electricity. Of course, they haven't really avoided it because they're now into LED lamps. They used to burn kerosene at night. Now, they readapt cordless drill batteries and use them to make an LED lamp.

So they hack these things, and why? The whole purpose of this is to not get electricity off of the grid. They don't want to be dependent on the world. That's their criteria and the second criteria for deciding whether to adopt technologies is simple, is will it strengthen our families, will it enable me and our family to have every meal together, as long as our kids live with us. So breakfast, lunch and dinner,

together as a family every day. So they'll use technologies that will let them work at home in the backyard, whether it be farming or welding or something in the workshop, and their kids will just go to a one room school down the road and they'll come back for lunch.

So they have every meal together as a family. That's a big thing. The second criteria is whether it encourages the community to stay together. So the reason why they have horse and buggy is because the range of that is only 15 miles, so everything has to happen within 15 miles. They have to shop, they have to go to school, the doctor, whatever it is and that brings their communities together. So they're thinking always, this new technology, cell phones, mobile phones, does it enable me to stay at home for every meal with my family, and does it strengthen our communities, and does it keep us separate? That's the three prisms that they have. And I'll just finish.

The main difference is that the Amish do this collectively rather than on an individual basis. That's the thing. So and they have articulated in a certain sense, they know what their criteria is. Modern people are making choices, but they don't have an articulation and they're going individualistic.

DSW: Okay. Thank you, sir. You made all the points I wanted to note. So, here it is, in your words, page 218: "Behind all of these variations is the Amish motivation to strengthen their communities." So what we have is, we have a group of people that are mindfully selecting their practices with the welfare of their community in mind. You could call it community level selection and individuals as agents of community level selection. Now, you go on to say that the Amish are very unusual and of course they are. I mean, there's nothing like them in other countries and so on. You have interesting things to say about that.

I want to make the point next as my next major point that this idea of being agents of—and instead of using community, I'm going to use system—agents of system level selection is not at all unusual. In fact, it lies all around us, at an intermediate scale, and what you find is, in fact, I have a series of conversations on this, which says, actually, it's the only thing that works. When it comes to positive change at a systemic level, two things don't work and only one thing can work. One thing that doesn't work is laissez-faire. Lower level units doing their thing just does not self-organize for the common good. The invisible hand is profoundly untrue. The other thing that doesn't work, centralized planning, because life is too complex to be figured out by any group of experts.

Therefore, the only thing that does work, can work and ever has worked is a managed evolutionary process. Basically there has to be a target of selection. Something you're trying to improve, typically it's systemic. You orient variation around that target and you select the better practices. So that mindful process of selection, when you actually look at positive change efforts, large and small, is the only thing that can work. They don't talk about it in evolutionary terms, but it's what they're doing. They call it pragmatism. They call it experimental. Whatever they call it, that's what they're doing. They have some kind system in mind. Linux, open source software, is a perfectly good example.

There's some system that you're trying to build. You're contributing to the system and it's always with the welfare of the system in mind. So that part of what the Amish do, this kind of mindful process of community/system level selection is all around us and is in fact the only thing that works, that's my bold claim. So I wonder what you think of that claim.

KK: Yes, that kind of, we'll call it, distributed governance is really the only thing that works. I think there is still within that realm, many, many, many different ways and different approaches, and I would say for a certain level of scale, we have some examples of stuff at work. You mentioned Linux and Amish or even some ways, town halls, are kind of like that too, they do work. So the question, the challenge before us is what is the fastest way for us to develop these approaches that work at this new scale that we're having to enter into at the global scale? What is the optimal route to develop those things, because experiments at this level can be consequential or I mean, failures at this level can be consequential.

So yeah, I'm in total agreement that that is the species that we're looking for. This kind of distributed governance, not centralized. It's very adaptive. It is articulated and designed.

We have some examples of some things that kind of work big but what will they look like going forth? And I think one of the areas where we're going to see something is what I would call like alternatives to the corporation, because the corporation is one of those mechanisms that we invented in order to achieve things, that we couldn't do alone, that has a lot of the attributes that you talk about. Of course, they're trying to optimize only one thing usually, which is profit.

So you want to have systems that are optimizing other metrics. We have nonprofits, that's interesting. The governments play a role. The role of government is to be inefficient, is to do the inefficient things that we need done, that corporations can't afford to do. So what I see is emerging are another set of ways of collaborating, cooperating, of governing that are going to use technology to enable us to do these things, and that's where I think we should be looking and assisting whatever kinds of new forms might emerge to see if we can protect them long enough so they can develop all the usual things you have to do with innovations.

DSW: Let me play that back a little bit and offer a solution and see what you think of it. And one thing I find useful often is to take a macro problem and shrink it down to a micro problem to a smaller scale. So if you see how a small group works, including an Amish group or really most small human groups, why they tend to run on an even keel, it has to do with such things as the importance of reputation. So there's a distinction between dominance and status. Dominance is power. You just take what you want. Status is reputation. You only get it when you do something for the good of the group. So, a reputation system of course requires social control so that you can prevent predatory behavior.

At that point, when there's clear norms about what's good for the group, then people compete for status. So therefore you've aligned basically the ambitions of the individuals with the ambitions of the whole operation. That's so simple. I mean, it's so simple and a lot of genetic evolution went behind the psychology behind that. That's why it seems simple. It's actually not simple at all. Just like seeing isn't simple. Seeing is computationally extremely complex. Thankfully it all takes place underneath conscious awareness. So if that's how a village runs, when it does, then scale that up, and what you find is in some places of the world now and other places, in previous times, such as America, 70, 80 years ago, corporations were like that.

This was before the shareholder value models and CEOs thought the way that their company could be good was to be a solid citizen company and earn a good reputation. So, I think that doesn't require technology, really. It can certainly be technology assisted when you think of things like transparency and things like that, that are needed, then technology can help with that but really it's like ... you know what it is Kevin? It's recovering an intuition. It's recovering an intuition that is, we all have and we all apply it at some scales, but just to realize that interactions among lower level entities, for example, corporations or nonprofits or any entity at these scales, that they're part of something larger than themselves, ultimately the planet.

There needs to be a system of social control to prevent predatory behavior, to recognize and prevent predatory behavior, so that the way to succeed is to achieve a good reputation.

KK: What would the system look like, the system that's preventing predatory behavior? You say there needs to be a system. So you like the micro. At the micro level, what does that system look like?

DSW: Well, it's what's inherent in any moral system is that a group of people have a sense of what's right and what's wrong, and if you do something that's wrong, then that's worthy of punishment or exclusion, and if you do something that's right, that's worthy of praise. So that requires transparency, we have to know what you're doing and so that's part of the machinery.

KK: Right, so do we have that now? Do we have that now?

DSW: We do in some contexts, but not others. So, for example, if you look at a reputation system online, how is it possible that cooperation—when cooperation does take place online, it's because these things have been put into place. We know whether you provided the service, if you didn't, then you don't get your star ratings and all of that. So, again, I mean, that's not rocket science, it's very intuitive.

KK: I guess I'm not really sure, are you saying that we have the system in place? We just need to expand it or you're saying we need to have a new system. I'm kind of confused about what it is that you're proposing.

DSW: I'm proposing that these things that are known to work at a small scale can be made to work at a large scale.

KK: Okay, and how are they going to be made to work? What is making them work or who is doing that work of making them work? What needs to change, I guess? And where does that change take place?

DSW: This is where in part and I don't want to spend the whole time talking on this because I'm kind of bending the conversation towards my own thoughts, but obviously it requires some kind of a consensus, and this is the lovely thing about human behavior, because the great danger of social life is to be pushed around, to be bullied, to be exploited. Everything prosocial is vulnerable. So the great danger of social life is to be pushed around. Therefore, social life is this kind of rugged independence.

I had a wonderful conversation in this series with an indigenous man named Tyson Yunkaporta. He's an aborigine. He has a book called Sand Talk, How Indigenous Thinking Can Save the World. But he was talking about indigenous thought and it was all about this.

It's like, on the one hand it says, nobody can tell me what to do and on the other hand, it's like, this is what we're going to do. So, there's this combination of strong independence. Nobody's the boss of me and strong communality, strong respect for the community. Really like the Amish, is what it was. So one step is to actually—and this is where theory and the kind of cosmologies and narratives that we're trying to build are important—is to convince every person, including one's reader—friend, this is the only thing that makes sense. Unless we all have the welfare, the whole earth in mind and coordinate ourselves accordingly, then you could forget about it. To back that up by science, I mean, someone might say, "Yeah, well, who says? What's your authority?" Now we can say, "Well, actually we have a very good scientific account of why this is the only thing that can work," okay?

So to the degree that science provides authority, which of course it does, then this becomes potent. Then more or less, you could make a very convincing argument that unless we all perceive ourselves as essentially, no matter what we are, a Leviathan organization or a single individual or a nonprofit or a corporation or a government, it doesn't matter. We're all human beings and citizens of the earth. Unless we actually work at that scale, then forget about it.

It'll be like the Amish town in which the community no longer does the selection. That's no longer the criterion. It's no longer a question of what effect will this have for our community? It's just a question of individuals making their choices. So that counterpart of the Amish saying, will this be good for our community? That's paramount. If we don't do that, it won't work at any scale. That's the message for me of micro evolution, as we make our choices, unless we're making them with that analog of the community in mind, will this benefit our community? Then those choices will only be made by lower level entities and nothing good can come from that. That's what I'm trying to get across.

KK: Okay. So I have a very tech-centric view of the world that first of all, our own awareness of our global nature is via technology. It's the fact that we have satellites, we have TV, telephones, which makes us aware of that. So, the challenge, the problem is being formed by technology and the solutions will require new technologies. Even if there was a desire for people to maximize the good of the earth, how

that actually can be done will require new technologies. I think you're right that new technologies, without that desire doesn't work, but the desire without new technologies is not going to work either or new tools. So, two of them need to go together. One of the things that we've ask ourselves now that we did not used to ask was like, "Okay—people are making the tools, what's their agenda? Do they have the right ideas in mind?"

So that's one of the conversations that has now begun to be taking place about any new technology is like, who are these people making it? What's their dream? What are their assumptions? What are their biases? I think that's a legitimate conversation to be asking at this point. And who's funding it, who will gain? So the broader conversation about technology is now everybody's responsibility in a weird way, which was not evident before. So I think conversations like this, where we're talking about, "Okay, we're going to make a global system. We are making global system whether we know it or not. Let's make a very deliberate global system that can maximize the global good for people and the planet.

That will require global scale technologies, which are new to us and we have a whole bunch of things we need to do to kind of make sure we can control it at times, or that it's going where we want to go, or that it's not predatory and all these other things. So that's where I am.

DSW: Yeah. Kevin. So let me play that back and agree with you, about 85% on what you just said. So that mean there's a little something I want to...but it's really small actually. Point one is that the idea of the whole earth as a group, a community, as you say, was inconceivable, beyond the imagination until just a few centuries ago. I think it's probably true, the first religion that really envisioned itself as truly a global religion, all nations, all faiths, was the Baha'i faith, which arose in the 19th century in Iran or Iraq. So before then it was just like, no, it was nations against each other and religions against each other. The Protestants thought the Pope was the antichrist. We had the crusades. Everyone is pointing their bayonets at each other.

But now, thanks to technology, which is advancing to the global scale whether we want it to, or not. In that sense, you're absolutely right, it has a life of its own. We can't stop that. We never will. It's made it possible to, not just possible, but actually this is what to me is so striking. It actually makes the whole earth the most natural unit. In so many ways. We have the earth from space, of course the Whole Earth catalog. You're part of history for that, but in so many other ways, global commerce and I like to point out that I live in a very small city, Binghamton, New York, like 50,000, it's a Rust Belt city.

So in the high school, Binghamton, New York, upstate New York, over 20 first languages are spoken. So much movement, and then people landing in this little Rust Belt city in upstate New York. Of course, we're having this conversation and so, it's just as easy for me to talk to anyone on earth as someone by my side. So thanks to all of that, it's not only easy but like the most sensible thing is to say first and foremost, I'm a human being and citizen of the earth.

Now, the little disagreement is that I think we could probably stitch this together based on our existing technology, because there's so much that can be done.

Of course there's more. Of course there's great new things that could come. So I'm not arguing against that, but it seems to me we've already generated enough tools and even if there were no further advances in our current level of technology, we could actually do this, the tools are at hand. Do you agree with that or do you think that we actually have to wait for something? It seems to me we've got the toolkit and of course we could improve it.

KK: Actually, I don't know. I don't think we have the toolkit. If you showed me a plan of how you could use existing technology to do it, I could be persuaded, but my suspicion is that...and toolkit, I include some of the conceptual ideas that we need to do that.

DSW: We need those. I mean, we need to get across this ... basically this paradigm of thinking.

KK: Well, I mean, new ideas of how to organize things. So, I would say, I don't see it right now, but I could be persuaded if there were these hidden tools at hand that could enable this. I mean, there are plenty of instances in history where people could have made things earlier, but didn't, like the bicycle. I mean, generally as my book argues, there is simultaneous independent invention when things, when it's steam power time, steam power is invented, many, many times. So it's possible that we are sitting on the set of tools that we need and don't know it, that's possible, but I need to be persuaded if that was true.

DSW: So, two parts, final parts of the arc of the conversation that I've embarked upon is that against this background, I got to the end of your book, and I found an ode to variation, what we need is variation, variety, variety, variety and let me read a sentence, "As a practical matter. I've learned to seek the minimum amount of technology for myself that will create the maximum amount of choice for myself and others. This cybernetician Heinz von Forrester called this approach, the ethical imperative, and he put it this way, always act to increase the number of choices." And I think that more or less is also your imperative is what you're saying, is just let there be choices.

KK: Possibilities is maybe the way I would summarize it.

DSW: And my response to that is, where is the selection? I mean, when we think about this in cultural evolutionary terms, variation and selection, and as we know from the Amish, that selection has to be a kind of a community level selection, or a system level selection, and if it's not, if it's just individual choices, then it's not going to get you good things. So it seems to me that what I would hope for, and why I'm, as you can see from my intensity here, and wanting to have this conversation, shouldn't you have ended your book by talking about variation and selection and the right kind of selection, but you ended on a note of just choice, choice, choice, let there be choices. Where was the selection at the end of your book?

KK: Right, right, right. So that is the difference again, between me and Chardin. Selection means that you're going to converge onto something that you have a direction that you're aiming to. So, I'd like to hear your answer to this, what is evolution trying to optimize?

DSW: You have to ask and answer that question on a case by case basis. So for example, in the case of a beehive...

KK: I mean, in the largest macro sense, as it goes through the universe on another planet, say, is it trying to optimize anything at all?

DSW: No, again, there's a distinction between macroevolution and microevolution asking that question.

KK: Right. So where is evolution going? What is the main story of evolution?

DSW: Well I, that's what's so interesting, Kevin. The first point I'd make to that is let's ask that question at both levels, the macro and the micro. Okay? At the macro level, there's some things you can say over very, very long time spans. You might be able to say that there's an increase in complexity. You might, with some exceptions. There's all kinds of chance things that happen and so on. You can say some things about convergent evolution that eyes will form because of their information. There's some things that you can say at the macro level but I want to say that those are far, far less relevant than what we need to say at the micro level because after all...

KK: No, no, no. Let's not leave the macro. So what is the macro story? I know that there's a micro story, but let's talk about the macro story. So we have the beginning, whatever it is, four billion years ago today. What is the difference between these two worlds, these two states, the state or even just talking about our planet. The state of today versus three billion years ago, what's the difference? What has evolution brought to this planet?

DSW: Yeah. Well, we have a mix, I think of how Stephen Jay Gould would answer that...

KK: What would you say? What would you say?

DSW: I'm saying that there's some broad generalizations that you could make, for example...

KK: Okay, like what? What's the story on this planet?

DSW: Increases in complexity of functional organization, that basically we've gone from bacteria to multicellular organisms, so there's an increase in levels of functional organization, but the list is pretty short, Kevin.

KK: Okay. Right. So you would say that then it's just complexity, so that the world today is more complex than it was three billion years ago. That's what evolution has brought.

DSW: Yeah. Although, the world of the dinosaurs is not more complex than the world of the mammals.

KK: Right.

DSW: Of course there's diversification...

KK: Diversification. That's possibilities, right?

DSW: Yeah, there's not much progressive about macroevolution.

KK: Progressive, meaning ... well, there is a difference. So I would say that there are a lot more possibilities. So the simple things haven't gone away, we still have a lot of simple things and we now have more complicated things. I see those as possibilities. We still have the possibility of a simple thing, like a bacteria, which we've plenty of, and now we have more complicated things. So we have an increase in possibility. Life can be simple, and now, it can also be complex. That to me is an obvious state of difference between now and in the past. There's more diverse things than they were before. There's more specialized things. I'm going to go through the whole list of what technology wants, which is increased complexification, increase diversity, increase specialization, increase mutualism.

DSW: Kevin, I'm challenging this, and this is where I think what we really need to do, actually a fairly seismic adjustment of what we draw from evolution, which is pretty big because you've already said that we really need to draw from evolution and actually, what I am saying is there has to be a fairly seismic adjustment in the lessons that we draw from evolution. I found the quote that I wanted, not from you but from Ray Kurzweil in his book, *The Singularity is Near*, where he says "Evolution moves towards greater complexity, greater elegance, greater knowledge, greater intelligence, greater beauty, greater creativity and greater levels of subtle, attributes such as love." I'm telling you that's wrong, okay?

KK: I don't agree with Ray. I wouldn't say that.

DSW: I'm not putting his words in your mouth, but I'm saying that kind of expectation, that evolution writ large results in these good things, because those are all good things, right?

KK: So that's what you want in selection, right? You want to select for good things. That's what you're talking about.

DSW: You do. I'm saying that if you now shift to the micro evolutionary level, which is the level that surely we want to operate in, here's the message, Kevin, here's the message. All those good things, including love, here's the message, they can evolve, but only when special conditions are met. And those special conditions are like the Amish conditions. Something like love. If you want to get that involved, then it has to be like loving groups, groups where there's love, do better than groups where there's not love. So this essential thing that you understand well for the Amish, that there has to be some selection at the community level. If we want communities that are worth wanting, then those communities have to be selected as communities, as communities.

That's the special condition, and if we don't have that condition, you'll never ever, ever get it, no matter how long evolution lasts. So the idea that what we want can evolve, but only when special conditions are met and if we don't have that special condition, evolution will simply go in another direction. It will go in a direction that we don't want. That's the seismic shift.

KK: Right. So I'm willing to bet that when we make contact with an advanced civilization, that their system will contain more possibilities than our system does because they've had additional centuries of technology, and if they had a world that was older than our world, then that natural world would also have more possibilities than our world does. So I think one of the things that evolutionists need to do is they have to get over the reality of these directions in evolution. They have to accept it. They just can't deny it. That's denialism.

DSW: Let me have you repeat that, Kevin, just so that I understand it.

KK: So the idea is that I think if you take a fair look at the states of say, the natural world over time, at the macro level, and again, if you accept my hypothesis, that technology is an extension of some forces...

DSW: Which I do, by the way, I absolutely do Kevin and much in line with Teilhard.

KK: Then you have to acknowledge the fact that there has been an accumulation of possibilities over time. So, is that the only thing that evolution is optimizing or creating? Probably not, but it is certainly happening. I mean, I think that is certainly the direction, that's one of the directions that it's moving to. And I think that is a hopeful story. I think that is something bigger than ourselves that we can align ourselves with. So, that's an arc, that's moving through the universe, that's bigger than ourselves. And when we participate in inventing new things, when we spend our day being creative, or even working at a dumb job that we don't like, that's trying to make something, another thing that is in the world, we are actually participating in that long arc of increasing the variety, the diversity, the possibilities, the choices in the world.

DSW: Yeah, that's a nice thing that you put in your book, basically you dignified...

KK: And I believe it. I believe it. I think that is something that will help people align themselves with the micro things that we need to do. In other words, what is it that we are trying to optimize as a society? What are those good things, that we can align ourselves with this big story. So for me, the big story that we're trying to tell this big history, this big view of the world is yes, there is something moving through the universe that's bigger than ourselves and that is this idea of trying to increase the possibilities and choices for everybody alive, and those who are unborn.

That when we do that, when we partake and when we select for the choices that optimize that, that we are aligning ourselves with this big force in the world and I think that is part of the story.

DSW: That is part of the story, Kevin, but I'm going to end on a...this has been a great conversation, by the way, and I'm so happy to have had it in the first place and to share it with others. I feel like we're playing a game of chess and that I'm going to announce checkmate. Of course, you might not agree, and I don't want to make this sound adversarial, in fact, with my metaphor I did and so I apologize for that, but here's a point I think...and let me just back away from that metaphor, and here's a point that I really hope that you can agree with, and here it is. What is the good of expanding choices when the choices are made by individuals, as opposed to, on behalf of communities.

That if we don't have the selection part, and for that selection part to be communities, by your own account—this is why I called it checkmate. By your own account you know that if the choices by the Amish were made by Amish individuals, it wouldn't work. So what's the point of expanding choices if the selection is made by lower level entities. So what we find is expanded choices are necessary or at least very good, but not sufficient. I think I would ask you to say, if you paid enough attention to the selection

part of an evolutionary process, in addition to the variation part, then I think that you would come to the same conclusion and I don't see how you could come to any different conclusions.

KK: I agree with that, but I think what I would say is that we actually don't even have the means to do that community level selection at the global level. So, what I foresee and what I'm excited about is that we're inventing technologies that would enable us to collaborate, community selection is one of those at levels and scales that we've never been able to do before. So, we have kind of figured out how we do it, like in a neighborhood with 120, Dunbar's number or 125 people. We have kind of corporations that may get to be hundreds of thousands, but they don't actually work very well in terms of selecting for things that we want and that are best for the community. But we want to be able to make these very large communities, large communities like global scale, like billions of people.

We don't know how to do that yet and what's exciting for me is that we are now in engaged and beginning to make the tools and the concepts and the imagination that allow us to do something together in real time at the scale of billions of people and that is going to be a very exciting phase in our evolution.

DSW: Yeah, Kevin, that's a great way to end and I really want to affirm that, and also, like you, I just revel in the examples that are coming up of cooperative platforms of all kinds, cooperative currency, there's one called Seeds that we're thinking of adopting. There's some currencies, crypto currencies and so on. Actually, when you look at them, you see they're deeply flawed, but others are not. They're built to last. And we work with Hylo, which is a cooperative platform that's kind of Facebook done right, and so on and so forth. So I couldn't agree more that we have these wonderful possibilities that actually are working at an intermediate scale. The nice thing is cooperative groups beat selfish groups. So once you get something that works, thanks to cooperation, it's competitive, it's a survivor. It wins the Darwinian contest.

KK: Right, so I have a little maxim that the number one human trait that I cherish is collaboration and not freedom because animals are free and look at where it's gotten them. They have total freedom.

DSW: There you go. Thank you. Thank you.

KK: We're on the same page for there. And I'm very excited for this next phase of human evolution as we become much more of a global species.

DSW: That's great, Kevin, thank you so much.