SCIENCE OF THE NOOSPHERE

Francis Heylighen and Shima Beigi

with

David Sloan Wilson

David Sloan Wilson: I'm so happy to be talking with you, Francis and Shima. This conversation is going to be centered on your article together, "Collective Consciousness Supported by the Web: healthy or toxic?" More generally, it's about the concept of the Noosphere, which was a term coined by Teilhard de Chardin and others in the early 20th century, and now represented by what we call the Internet Age, global consciousness, collective consciousness. And of course we'll be making that connection. But perhaps I could ask you to begin by setting the stage. What caused you to write this paper and to work together to write this paper that we'll be discussing?

Francis Heylighen: Well, I actually had been working with Shima already for a while on consciousness in the sense that there is recently a lot of things going on in the neurophysiology of consciousness. That means kind of dynamical models of how neurons in the brain form something that is like consciousness, and what that also means for consciousness in the more practical sense of how conscious people are of what's going on in the world.

Now, I was already interested in the Noosphere for a very long time via also the concept of the global brain. The idea that a World Wide Web forms kind of like a brain for humanity. And then it seemed logical to connect these two, if we were looking at consciousness in the human brain, and if we were looking at the Noosphere as the equivalent of a global brain, then we would come to one of the frequently asked questions about the global brain, will the global brain become conscious? In Teilhardian terminology, will the Noosphere become conscious? It's one of those questions that people always ask, but you don't really know what they expect as an answer, because what consciousness is is very ill-defined.

So that's why we decided to connect these theories of consciousness with theories of the Noosphere, and we found that there are actually some quite convenient analogies between the dynamics in the Noosphere and the dynamics of the brain. And the most obvious one is that, what is consciousness in the brain? It's those parts of mental activity that you monitor, that you examine, that you critically consider, so that you can, if necessary, change them, redirect them.

What are subconscious mental processes? These are processes that happen automatically in the background. It just goes, you put your hand on a hot plate, you pull it away before you have had the time to think, "This is bad, I'm going to burn my hand." So most processes in the brain are subconscious. They just go, input, output, and whatever happens in between, you can't intervene, you can't monitor, you don't know how you're doing it.

Consciousness means you are aware of something. And then you think about what does it mean? What can I do with it? Is it really what I think it is? Am I not mistaken? Am I not seeing something different from what I think I'm seeing? That's what consciousness is. And then, if we apply that to the Noosphere, we get this nice idea that if the Noosphere, as defined by Teilhard, is the sphere of thinking, of thought.

Thinking by definition is conscious. It means questioning things, looking at different angles, combining information from many different places. So actually the Noosphere is in a sense the conscious part of the global brain, and then the subconscious part of the global brain is just the infrastructure of the web. The infrastructure of the web makes sure that all these thoughts are being forwarded from the one to the

other, recorded on servers, distributed among different computers, that happens in the background, or as you might say, the subconscious idea.

DSW: Shima... So thank you, Francis. Let's get your perspective coming into this article. Tell us a little about yourself and then how you came to write this article with Francis?

Shima Beigi: Thank you very much. First of all, I'm very happy to be with you and also collaborating on this very interesting project of the Noosphere. Well, my background, I am a resilience scientist, resilience of complex systems in particular, also smart cities and the application of artificial intelligence in urban systems. This is my background. I did my studies mainly in the UK.

Actually, my collaboration with Francis started, I think, about seven years ago when I found his articles on complexity, science, and enough that I could basically secure myself a funding fellowship program in Brussels. Then I came working with him directly. Well, this is very briefly about my background. We can speak about it also further later. But then the question of how we came to write this article.

I mean, given the complexity, like complex science, that was our backgrounds, cybernetics, complex adaptive systems, there was always this question of how we can make people as agents in the complex system more aware of the impact that they have on their surrounding environments. The actions that they have, also the impact on others, and kind of connecting that to sustainability, urban dynamics, making systems more resilient.

So this was always at the background of our research. And then connecting that with the Noosphere was... Well, the idea of the is kind of connected to also sustainable development, Gaia theory, systems thinking. So it was obvious for us that the next step for the Noosphere, as it's set out by Teilhard de Chardin, is to connect it with what's the state of research right now. For example, the curiosity about consciousness. Also, bringing the qualitative nature of consciousness into research. And then also the digitalization and decentralization that is happening around us.

So the age that we're living right now, 21st century. The age of technology and computers and algorithms, are heavily impacting the way we think. And if you look at the Noosphere, what is a Noosphere? A Noosphere or a mental sphere is created by the unity of thoughts that is being shared by collectives. And this thinking, this unity of thought right now in 21st century, is subject to many different forces that inspired us to hone the conversation or steer the conversation toward how we can actually look at the qualitative dimension of the Noosphere, and how we can go deeper into the Noosphere, how we can change it? Is there any way to really, not engineer it so to speak, but really affect it consciously, mindfully?

DSW: So much to dive into here. One thing I'd like to distinguish with consciousness is to make it two dimensional. On the one hand, we have what we're clearly aware of and can talk about. And then all that stuff that goes on that we're not aware of, that's subconscious. So let's think of that as one axis. And then another axis is whether it's a deliberative process or not, or a mechanical process or something that would be more intentional and deliberative. The reason I think that is interesting to think about as a two dimensional space is that, as you know, there's a lot that goes on beneath our awareness, in other words, we cannot report on it at all, which is very, very sophisticated. And actually, it’s hypothesis testing, it's creative. I mean, we'd call it conscious, except we're unaware of it. We can't report on it.

And so I'd like to know what you think of this as a two dimensional space, and some of the things that we can't report upon at all, including very creative processes. We know this happens. Something goes on inside our head. We call it, you know, we’re incubating it, and then all of a sudden, ding, we're suddenly made aware of it as a new idea. We might call it an "aha" experience or something like that.

So whatever went on in that subconscious space often is very conscious I want to say. So it's almost as if we have to be distinguishing two different meanings of consciousness. What do you think about that? Either one. Shima, why don't you begin?

SB: What you described, I think, is really beautifully explained by Dehaene in his book on brain and consciousness. He really explains that actually what we might call consciousness is not really flat. So we cannot really say that what's happening in the brain, and the sensory mechanism or sensory input that is being received by the brain, is fully conscious. Actually, there are examples that you can prime individuals and effect how they are thinking without them being fully aware of that.

So the question of making this consciousness as a two dimensional proposition, I think it's very difficult, it's very complex, to really cut consciousness into layers that can be then defined as whether we are fully aware of those layers or not. So I think actually thought for it to be generated necessarily, it doesn't need a hundred percent consciousness. Sometimes the thought is really generated by virtue of a process of emergence, or being really influenced by the social input or the algorithmic input. Even being surrounded with digital, for example, systems, or being exposed to the web.

So, for me, also writing this article and calling it "How the Web Can Support Thinking" is that to what extent we become conscious of mechanisms that influence the cognitive side of thinking. I don't know, Francis, if you agree with that, or what you think? Or maybe you have a different point of view.

FH: Well, I don't agree with the two dimensions, because I think that if I understand David well, one dimension he speaks about is what you might call the intelligence or the creativity of the mind, which we find both in the subconscious and in the conscious. But the reflection about it is typically conscious, and what these different theories that we reviewed of which Shima mentioned, the theory of the global workspace, which was developed especially by Dehaene with lots of experiments.

What it says is that for something to become conscious, it needs to circulate to what is called the global workspace in the brain. The brain consists of lots of modules that each are specialized in particular things, and normally information comes in. For example, you see something, it enters your visual cortex. It goes through several layers. It is interpreted. You recognize the thing that you saw, and you say, "Well, okay. That's a cat," and you know it's a cat. But all the intermediate stuff, so the pixels that enter your eye up to the conclusion, "This is a cat," it's a subconscious process. You cannot stop it. You cannot intervene with it.

But if now you want to start to think, "What should I do with that cat? Is that a wild cat? Should I approach it? Should I maybe check whether it's a cat of one of the neighbors?" Now you need to keep this concept of cats awhile in your working memory. That means you need to continue circulating in your brain while different other parts of your brain start examining it. So, that is the idea. That is, you need to keep something in working memory, and working memory in the brain is not at all trivial because the brain functions through neurons that get activated, and activation cannot stay in place. A neuron that gets activated passes on its activation to a next neuron to a next neuron to a next neuron. It doesn't remain activated.

If you want to keep something in your working memory, the activation needs to circulate. That means it needs to come back to the same place by going around and around in the brain. And while it's going around, it is what is called being broadcast. It means all these other parts of the brain can now examine it, can now add something, can take something away. It can say, "No, it's not going the right way. It should go this way." That is this phase of reflection or examination. And that is a phase I think which is especially relevant to the Noosphere.

That is, somebody has an idea, let's say a new theory about the origin of COVID, and then the idea starts circulating. That means it's passed on from person to person. It goes in different media, and then people

can start examining it critically. And that is this phase of circulation and examination, which I think is essential for consciousness. If it's not being examined, it's not conscious.

It may be very creative, it may be very smart, but you just take the result as it comes. And you can't say, "Why did I come to this result?" Intuitively you have understood something. You've had a great idea, but why that intuition? What were the elements you used to come to that idea? You don't know. Consciousness is, one, you start examining it, and that requires that it creates some kind of a stability circulation that allows other parts of the brain to examine it.

DSW: Well, I mean, in a sense, I agree. I agree. In fact, if we want to cut to the bottom line and ask, "How do we solve the problems of our age such as COVID or any massive problem?" It has to be a very deliberative process of, in my terms, variation and selection. We have some target, which is stopping the COVID virus. We have to examine, "How are we going to do this?" That's variation that's in around the target. And then we have to replicate best practices and do that again and again and again.

So, that's a conscious process of evolution. As I would put it, and we need more of it. Much, much more of it. So actually, that's kind of the bottom line, as far as I'm concerned. I'm guessing we all agree about that? Was my little description something that you would also agree with as a conscious process of solving a problem such as COVID?

SB: Yes. I think the bottom line, basically the moral of the story here, is that the world we live in right now is becoming more and more complex. And for it to be functioning at a level that we can call it sustainable will require a global kind of agreement on having critical thinking on the kinds of means or thought processes or ideas or ideologies that are being spread around. Especially right now that we live in the age of Internet and the web, being supported by the web.

So bringing more awareness and I think consciousness, not necessarily in the consciousness research meaning, that is becoming conscious of what we're putting out there or becoming more aware of the processes that are contributing to emergence of a phenomenon such as COVID-19, should become a general practice. That we should become more conscious of the need to have conscious thinking processes and conscious conversations. So this is something that I would like to add to how you summarized this conversation so far.

FH: I know this concept of conscious evolution, which is that instead of waiting until natural selection and variation for us decides what the next step of evolution is, that we start thinking about different possibilities and selecting for ourselves. So what we are proposing in our paper is kind of a subset of that. That is that we are looking at cultural evolution or mimetic evolution in the Noosphere, because ideas evolve in the Noosphere, and that we want to intervene in that evolution by finding some way to promote what we call the healthy ideas, the healthy thoughts, and to suppress, or at least make it less likely, that the unhealthy thoughts would spread.

So the typical example we gave of the unhealthy thoughts are all these kinds of conspiracy theories that tell you that you should not under any circumstance be vaccinated because the vaccines contain chips or are dangerous or whatever. Or the healthy form of thinking is a kind of scientific thinking where you have certain hypotheses of what will cause the virus. You test the hypotheses. And if it turns out that the hypothesis is correct, then you implement the policy.

So it is conscious evolution, but conscious evolution at the level of the meme. So at the level of the ideas that circulate in the Noosphere. To do that, we need to become more conscious of how these ideas are being propagated. What makes it that an idea will become popular, will spread in the Noosphere, and why an idea may not spread even though it would be a good idea.

DSW: I'm going to butt in in a nice conversational way, Francis, about this kind of unit of selection. On the one hand, we're selecting memes. Okay, I got that. But on the other hand, we have a criterion of

selection which are healthy memes compared to unhealthy memes. We want the scientific memes. We don't want the fake news memes. And the criterion for that is whether it's going to benefit the whole system. And so on the one hand, we're selecting some lower level things like these ideas, but on the other hand, our criterion of selection is the whole system.

So I think we agree on that, but it's very important I think, because there's lots of confusion on that point. And when people talk about selecting memes, they act as though the system has nothing to do with it, but it's the system that's the entire criterion of selection. And if you didn't have that criterion of selection, who knows what you'd get, but it would not be good for the whole system. So there, again, I throw that out there. Suspecting you'll agree, but you'll need to confirm that.

FH: Well, it's part of the research that Shima and I haven't yet done sufficiently to be satisfied with. It's a broader research in sustainability, in resilience, in what is it that makes that this whole system will be the kind of system we want. That means a system that synergetic with a minimum of conflict, that is sustainable, that is going towards the long-term.

There are quite a number of principles in complexity science, in self-organization, in evolutionary theory, in cybernetics, that can help us to understand these things, but it is, of course, a huge problem of defining those. And we are just now developing a new paradigm that we call relational agency, which is actually, you have a lot of different agents or agencies that are not always aligned in their goals, that sometimes are in conflict, but that by interacting create relations with each other, and you would like these relations to be as synergetic as possible.

That means that the interaction between these agents create something that is more than the sum of the parts, it means they create extra resources, which is the opposite of conflict, where the friction between the agents will mean that they will both have less resources than they had before. For example, when you have a war, even if one party wins, as a sum, both parties lose because a lot of things are destroyed in a war. On the other hand, if you have a solid collaboration, then both parties gain because you produce more resources through the collaboration. So this is a concept of this relational agency, which we hope will develop into some kind of a general philosophy of this mutual adaptation, co-evolution of lots of different agents.

DSW: Well, I'm so glad that you are taking the conversation in this direction, Francis. I'll take my turn in a minute, but Shima, do you want to chip in here on this before I take my turn?

SB: I think what's very important is to bring awareness to the interconnectivity of current systems. And I think, for us, also with the example of relational agency that we're developing right now, the whole focus is to bring more... For example, when we speak of the Noosphere, it's very macro level. So it's not really a microscopic Noosphere, kind of like everybody, or people start to think as a microcosm or a connection, or a part to a whole. And then also consider themselves as active agents in a complex system that their actions and behavior impacts others.

So for us, this relational agency, I mean, if I can add a little bit to what Francis mentioned, is this awareness of relationships and how different relationships lead to different directions. And as evolutionary beings, I think we are capable of creating adaptive, selective pressures that would help us to evolve in certain direction that is desirable, that is much more adaptive to the spirit of the time that we're living in. And also bringing, I think, global conversation about memes, or memeplexes, or ideologies that are not serving us at this particular times. And I think this needs a lot of, I mean, of course scientific discussion. But also I would like to add that I think it needs a lot of empathy. It needs a lot of emotional intelligence. It needs a lot of cultural awareness for this to happen.

So these are the... I want to say like a part of scientific writings and research that we're doing. I think it also needs global leadership. It needs a global empathy. It needs a lot of mindfulness and awareness.

DSW: I'd like to talk a little bit as a biologist because I think that often, my main contribution to these kinds of conversations is as an evolutionary biologist. And what I find is that there's a lot of complex systems thinking as there should be. But the complex systems thinking is often general complex systems thinking. And the study of complex systems is more general than the study of living complex system, because there's non-living systems and living systems. But living complex systems are such a special subset that there are some of the insights that we need are very specifically evolutionary.

And that's what I think is my contribution, is to kind of highlight some of those things. And so if you look at actual brains, individual brains, of course, they're enormously complex and they're adaptive, but they're also units of selection. I mean, they have been selected. Individuals with brains that work better were the ones that evolved. So the unit that's functionally organized is also a unit of selection. There's a clear process of selection that resulted in brains. Now let's take another example. Let's take two species or two individuals that are mortal enemies and they're trying to exterminate each other. And each of those individuals has a brain, but you would not call the pair of individuals, what they do, a brain. That would be just a category error. They're two intentional agents trying to exterminate each other.

And so another point to make about evolution is it's all about relative fitness. It's about who is more fit than who. And so if you have some kind of negative co-evolutionary spiral, that results in something that's highly dysfunctional. Well, that happens. And we know that happens in human life. And the word regime, you use a number of words and let me just bring them out. You use attractors, reaction networks, of course we have basins of attraction, the evolutionary metaphor is adaptive peaks. All of these things basically refer to configurations that are stable. Their main property is that they're stable. They hang together. If you perturb them, they come back to their state. That's what all of those things have in common. But how well they function as units, whether they function for the common good, for example, is not part of the concept.

In human life, we have regimes that can be enlightened regimes, or corrupt regimes. And some of the corrupt regimes are among the most stable. And if you take a corrupt regime, in which basically the only beneficiaries are the elites, let us say, are very small. And not even for them, because they're so anxious to cling to power, that actually they're soon to be deposed and then replaced by someone just like them. Nobody's benefiting from this. And yet it's stable. And our challenge of course, is to replace it with something better. There's some things that you don't want to call a brain. It's what I want to say. And in biology, this was kind of a hard one insight. In the early days, for example, people thought of ecosystems, multi-species ecosystems as like a big organism, or maybe like a social insect colony.

And then finally they decided, no, actually not. The idea that nature left to itself strikes some kind of harmonious balance, not true. And now the term ecological regime is the current term among ecosystem and community ecologists. Nature left to itself, falls into some basin of attraction, some reactive network as you would put. And there's many of them. They just hop from one to another. And as to how well it works for the common good, for the good of the whole assemblage, well, no, stability is the only thing. And if you want to see an ecosystem that's adaptive, you need to have a process of selection. So our microbiomes are actually pretty adaptive in addition to our genes, because when individuals survive and reproduce differentially, not only are their genes being selected, but their microbiomes are being selected.

So there is such a thing as a microbiome, or an ecosystem that's adaptive at this ecosystem level, but only by a process of selection. And that's the point. If we want to employ the metaphor of a brain, or a Noosphere, or something that's a thinking entity, we have to identify a process of selection whereby that came to be. And if that process of selection didn't occur, then we have something like a mere attractor, a mere regime which is stable. We know that. But as to whether it works like an organism in any way at all, including mentally, well, no, we shouldn't expect it to. Well, there's my diatribe. And so I'm eager to know what you think of that.

FH: Well, I mean, this is of course, one of the biggest problems. But Shima and I have started addressing that. And it's part of a bigger project that is funded by the Templeton Foundation on The Origins of Goal-Directedness on which we are also working. The idea is that things self-organize by getting into attractors, but that there are attractors that are resilient and attractors that are not resilient. And by resilient, we mean not just stable, we mean able to adapt to a very wide range of circumstances. So the idea is that once the system gets in this kind of regime, you can perturb it in lots of different ways, and it will each time survive in some way. And our assumption is that what we would call the healthy regimes are the ones that have this very wide range of adaptability, while the more rigid closed regimes are the ones that do not have this range of adaptability.

And the classical example in a society is a totalitarian system versus a democracy. The totalitarian system can seem to be very stable, but if something happens like what happened with the collapse of the Soviet union, it's really gone. It can collapse completely. Well, democracies don't always function very well, but a mature democracy, generally it adapts because it's open. The openness is the ability to adapt while a totalitarian system, there is a strict number of rules and a limited number of people. And if those people are on there, or these rules are no longer there, and then the system collapses. So that was also our idea in trying to distinguish between healthy and unhealthy form of consciousness in the Noosphere. The healthy ones are the ones that have this adaptability. And for that, we used a very inspiring theory of consciousness, which is the Theory of Adaptive Resonance.

So I spoke about culture as this kind of a regime of circulating activation. The circulation is an attractor, but you want this attractor to be adaptive. That means if new information comes in, then your idea should change and adapt. If your ideas constantly repeat themselves as you would get in a totalitarian regime or in a fundamentalist system, then they may seem to be very rigid and stable at the moment. But sooner or later, something will come that they simply can't deal with. And then the system kind of breaks down. So that is something we definitely need to develop further, but that is our general take on distinguishing between good attractors and bad attractors. The good attractors are the ones that have this evolvability, this flexibility, this adaptivity, while the bad ones are the ones that are very stable within a limited range. But if something happens outside of that range, they just fall apart.

DSW: Yeah, Great. Shima.

SB: First of all, thank you so much, David, for bringing this conversation in this the direction. Because indeed, it was also one of the steps of our thinking to come to the conclusion of there are different types of Noosphere, like a healthy Noosphere, or toxic one. The idea of units of thoughts connecting to one another and giving rise to a super kind of a system or organism that's called a Noosphere is not a linear process, is quite nonlinear. Therefore, it has a lot of properties of nonlinear systems, such as attractors, basin of attraction, attractors, and different types of attractors, also different regimes. You research ecological systems, and how there are critical transitions change within those regimes, and also opportunities for change. So this was clear to us, that when dealing with a complex systems, we should be aware of this inner working, or I call it the inner game of the Noosphere, to become conscious of those.

And Francis mentioned it. I also wanted to mention the Adaptive Resonance Theory. And particular part of that theory that discusses about the dilemma that a conscious organism always faces is the trade-off that the brain makes between stability and plasticity. That is stability-plasticity dilemma, that is to what extent the organism is capable of monitoring the flow of information, and also selecting openness for a new form of information to be integrated with the old layers of information. So systems that are basically closed or have a lower coefficients of observing this flow of information are basically incapable of adapting to the new information. So their learning capability is really hindered because of that lower adaptability. So I agree with what you mentioned about this becoming aware of that... Well, some

regimes are resilient, but not in a positive way. They're extremely resilient, but they're also extremely unhealthy for the global unit, or for the whole humanity, or the whole system.

What we decided to do is to basically ask this question that, can we start to look at the unit of thought the way we think as a basically microcosm for change. So can we change the initial condition? Can we bring more awareness to this inner working of Noosphere? And then from there, then we can work our way up and then design maybe more, I would say like conscious self-organization. I don't want to say guided self-organization because I don't think that it fits in this thinking. So become more of conscious of this complex adaptive systems are complex. Yes, they are unpredictable. Yes, but also there are windows of opportunity. If we become more tuned into them, we can influence them. And if we become more conscious of, for example, regime shifts now in ecosystems those regime shifts, or the changes, or the critical transition or critically slowing down become really the early warning systems, or very early warning signs that we can do changes. I think we can do a lot still even if the system is very complex and challenging.

DSW: I'd like to distinguish between we say healthy versus unhealthy. I'd like to introduce the concept of levels of health. Because what we find is that a lot of what we see as pathological, is actually adaptive, healthy at a lower scale. And so basically self-preservation is a good thing until it becomes self-dealing. Helping family is a good thing until it becomes nepotism. Helping friends is a good thing until it becomes cronyism. And just about everything that we see as unhealthy at a large scale…no, I'm going to back that up. Much that seems unhealthy at a large scale is actually perfectly healthy at a lower scale. And so now, in addition to that, there are some things that are just plain unhealthy for everyone. And this introduces the concept of mismatch that whenever you get any system that's well adapted to its environment, and then the environment changes in some way, all bets are off. What used to work no longer works. And that's unhealthy in every way.

So distinguishing between levels of health, there's a very important category there. And then various forms of mismatch, which is just things are misfiring for everyone. I feel that those are two forms of dysfunction that need to be made very clear because they require different solutions. They have different causes and they require different solutions. Something like polarization, for example, is a case of basically two social entities are set against each other. They're mortal enemies. And if you look at each faction, you'll see a lot of adaptation and what they do, including fake news. The point I want to make when we talk about these crazy memes, QAnon, and crazy ideas about the coronavirus. This might be just something that's misfiring. Or in fact, it could well be part of something that becomes a very strong social identifier and so on and so forth.

There might be something much more adaptive about crazy ideas. And we know that with all our religions, right? I mean Christianity is a collection of crazy ideas, but they have a purpose. And so, I mean, the whole concept of adaptive falsehoods and meaning systems is a deep, deep epistemological subject. Just because something's crazy in terms of just not corresponding to factual reality, it doesn't mean there's a lack of function as part of the anatomy and physiology of a group. So again, I've thrown a lot of stuff at you and you're welcome to comment on whatever has stuck.

FH: Well, I think one of the problems that David is mentioning is that when you speak about being adaptive, it's a question of adapting to what. That means a system has an environment. A system is supposed to adapt to whatever happens in its environment, but you can make an environment wider or narrower. If you are an in-group whose environment is some out-group that can either be fought or exploited, then maybe it's very adaptive to find a strategy to eliminate that out-group. If the system on the other hand is the whole world, that to say the global superorganism, the Noosphere, then any in-group that fights another out-group is non-adaptive because it creates friction within this Noosphere. So I think that the biggest, the most important dynamic of the last hundred years, let's say, is globalization. The fact that we are more and more interdependent between people across the whole world.

Not only people, we are also becoming much more interdependent with the ecosystem, with the climate, with technology. So the network of things that we need to adapt to has become much bigger. So adaptivity in a sense of openness to new things, I think, has become much more of a value now. That it's sort of adapting to one particular circumstance that maybe you might deal with by let's say, by just killing whatever it is that's bothering you. It no longer works because that one thing that's bothering you is connected to other things and other things and other things. And in the end, by killing the one thing that bothered you, you're creating a whole cascade of negative effects on yourself. If you are the Taliban and you want to kill all non-believers, you can't really afford that anymore in the present world. Maybe in Afghanistan of a hundred years ago, you would kill all those that don't believe in the strict interpretation of the Islam according to Taliban, you would be very adaptive.

Nowadays, you will basically kill off all your intelligence and nobody will want to work there any more. Your airports will not function anymore. You will be boycotted from all sides, so you no longer can afford this kind of adaptive strategies. So that's why polarization at this moment, I think is quite unadaptive. And that's one of the reasons why we are thinking in terms of this openness as being the most, the best thing of health. And I just wanted to add something to what Shima said about the plasticity-stability dilemma and something I forgot to say. The plasticity is indeed this ability to not just be stable with whatever you have, but to take into account any new inputs that may be there and try to use them in a positive way. So means not just a priori present as perturbations, but think about this new input. Can that be used in some kind of a synergetic way to develop a better strategy, a better insight, a better functioning than we had before?

DSW: Yeah. Shima, please add and then I'm eager to take my turn.

SB: Yes. I think something that I would like to say is that, well, to some degree I agree with what you mentioned David, about adaptation. But also, I think I look at adaptation a little bit differently, mainly because my background is about making systems more resilient. And one of the questions that is been always asked in making a system, and by system here I mean a complex adaptive system is actually designing adaptive pathways. So depending on the ways that you define the adaptive pathways, you can get a different resilient outcome, or you can say, for example, you can lead your system to basically move toward a different type of attractor. That attractor can be a good attractor, but can also be a bad attractor, but you can also destroy that attractor and create a new one by designing transitional strategies. So for example, I give an example to not be very abstract here is that for example, with climate change and the shift from fossil fuel to sustainable sources of fuel, it's very difficult to immediately switch to a new source of fuel, but it's easier to create adaptive trajectories or pathways so that you gradually lead your system toward that new attractor or new outcome. That is the more desirable. This is something I wanted to add.

And second thing that I wanted to say is that I would like to take this kind of question of adaptation to a more, let's say a metaphysical and epistemological level by saying that the way I look at what's happening right now in the world as more of… right now actually finishing a new paper, but I call it mereological crisis. And mereology basically is a part-whole relationship in mathematic and logic that when a conversation or a level of dialogue between parts in a complex system start to basically be under certain kinds of stress or pressure, or being caught or changed, what happens is that parts start to lose their frame of reference, and what they do after that is that they become discrete parts and they no longer create a whole. And that would create a crisis within the whole that the whole loses it's integrity.

So from my point of view I would like to say well, adaptation is not a problem, because we are adaptive systems, we're adaptive learning systems, but for example what Francis said, adaptation to what? But also what is available in the environment for the agent to be able to adapt? So the fuel, kind of the food if you like, for adaptation is being provided. And I think we can design that. We can make changes.

DSW: Oh yeah I agree. I agree. And I think in some ways we're kind of playing in this big complex multi-dimensional space on our way to our destination in terms of what we need to do in real-world settings, such as smart cities, that ends up being kind of commonsensical, at least in retrospect. And actionable. But I wanted to bring in something which I regard as very Teilhardian, which is that this gradual expansion of the Noosphere is gradual. And if we want to find good examples of a Noosphere, in other words a human population that functions like a single brain, we should be looking at intermediate scales. The global scale that's something that has to be brought into being, it doesn't exist yet, but at intermediate scale, various polities, various cultures, various social groupings that because there is a history of cultural evolution at the group level, when you examine them as meaning systems, and I've done this quite extensively for religion in my book, Darwin's Cathedral. Starting then, and continuing. We actually can see cultures that are very, very well adapted to their environments, and there is a thinking element to it that has been expanding through human history as Teilhard said. And as Peter, people like Peter Turchin document, there's a whole breed of historians that are doing that.

And so here we are now with kind of intermediate scale human societies complete with our thinking dimension. And we need to expand that to the global scale. Francis is right that globalization has only dawned upon the world within the last few centuries, the idea of we're all citizens of the earth. I believe that the Baha'i Faith is arguably the first faith that really envisioned itself as all embracing, all creeds, all races, all everything. That was 19th century. You go back further than that and it was beyond the imagination that there might be some.

But now of course the fact that we're globally interconnected has just become a fact of life. I mean, so that's, and will always remain so. But as to whether we actually become functionally organized at the global scale, that's the final step for Teilhard, and it's in the future, we shouldn't call the global interactions, global interconnectedness a brain at this point, that's something we need to create. But if we go down to some lower scales and intermediate scales, we could actually find some pretty good examples of cultures that are highly adapted to their environments. And yes, there's a thinking dimension to that, and part of that's unconscious. I mean in many cultures the members of the culture behave adaptively without even knowing that they are, they take part in something and they don't even know. Friedrich Hayek made that point for economic systems. And what he called the extended order, economic systems work without anyone having invented them or knowing why they work.

So that conscious-unconscious distinction can be made for cultures, but we should be looking at an intermediate scale. And then of course our objective is to build up to the global scale. That's how I see it. So I'm really eager to know how you see it. Shima why don't you go first this time?

SB: I think something that I would like to add to what you said David. I think globalization, yes I think it's a force that is influencing how different layers of the Noosphere kind of connecting to each other, and creating something that maybe we call it a meta Noosphere or something like that. At the same time I think the thinking that we are having right now also is different. So for example, the amount and intensity of information that individuals are being exposed to is I think very different from 10 years ago. I mean I can say 20 years ago, I'm not that old to say like maybe 50 years ago, but I think comparing that to 20 years ago the way we are using information, the way we are handling information is really affecting the individual's way of thinking.

And I think this is something that I feel, especially with COVID I would like to bring this example back that also we give in the case of our article, is that I think the example of COVID was very interesting just to me, that I think for the first time a new crisis or a stressor was being experienced at a mass level, at the same time adaptation was happening at the mass level. So scientific adaptation, news adaptation, or people adapting to the same thing. So that is really a kind of, I think a network effect of adaptation that was very present with COVID pandemic. That I think opens this possibility, or maybe way of improving the Noosphere, for what we call as maybe we should think of sets of etiquette's as, for example

netiquettes or etiquettes that are being moral, that are globally accepted for everyone to think about them, to adopt them and to basically take into account those kind of etiquettes. This is I think something that I can say right now.

FH: I would like to elaborate on what Shima said. I guess what David was saying is there are a number of existing communities, let's say religions, cultures, that function quite well according to norms that they are not consciously using, those norms are the result of a process of evolution that probably has taken centuries. These norms have undergone selection to be pretty effective within that particular community, dealing with the particular type of problems that that community faces. But now suddenly we are turned into a global society, which has these problems like COVID, but which also has this means of interaction like the Internet. And suddenly we don't have these rules anymore. We don't have any clear norms that tell us how we should behave in these circumstances.

And what Shima was saying about netiquette or what I might also call Internet ethics, is we need to learn a number of norms of how to interact at this global level of the Noosphere, dealing with the Noosphere the way it's shaped now. It has a completely different dynamic, which is novel for everybody. We may have some rules in our local community for example, do not gossip or do not tell untruths, but at the level of social media those rules are not obviously applicable. And then you see all kinds of pathological things appear, and you can't even blame the people who are doing it, because yeah, their norms do not obviously apply to this new medium in this new global situation, and things that were pretty innocent before suddenly can balloon into some world problem. I'm pretty sure that in previous pandemics lots of conspiracy theories were being propounded in cafes and in families, but those never reached the global level, and therefore they didn't have the kind of impact that conspiracy theories nowadays have.

So as Shima said, we need to develop this kind of netiquette rules or norms for the global Internet based society, and looking at how traditional societies have done it within their local thing is definitely useful, but it probably won't be enough, because there are new dynamics playing.

SB: I wanted to just add something that here. Like societies that have been very successful in adapting themselves to the situation that we're facing, I think maybe they had these moments of realization or aha moments, or something happened that really changed their paradigm. So I think if something like that happened to them, if you take that as a kind of maybe a general process of how we change our minds, or how we change our world views, then we can maybe think of mechanisms that would help us to ... Like yesterday, we were discussing with Francis that are there kind of gestalt change cycles at the level of the Noosphere? And if so for example, if you think about the Arab spring or COVID-19, or the collapse of economy, economic crisis in 2008, or September 11, these are events that really are affecting the collective consciousness. So maybe we can use them also in positive ways to create change, and to create moments of adaptation, or to create really necessary conditions for creating shift of paradigms. This is something I think maybe related to this conversation.

DSW: A point that I want to make is that it doesn't require a crisis or an environmental change in order for pathologies to take place. And I think that in many ways what's pathological is the entire concept of laissez-faire that everyone can pursue their separate interests and that, that'll somehow work out for the common good. And if you look at for example, all the tech giants, Facebook, Amazon, Google, all of them, but let's take Facebook. The fact that they're basically based to maximize advertising revenue means that their whole strategy for uprating or downrating content is based on clicks. And so it's at that point that you have this huge, huge bias imposed by basically a shareholder value revenue model. And you didn't need the COVID pandemic for that to be pathological. That was pathological all by itself.

So we have that kind of thing to contend with, but I've been meaning in this conversation to, and we will get to Wikipedia, but I've been meaning in this conversation to bring up the work of a Michelle Gelfand. I hope you know about her. And if not, I'm happy to introduce her to you. She is a cross-cultural psychologist and she's made a career out of the distinction between tight and loose cultures. It's a

continuum of cultural variation from tight cultures, which means strong norms, strongly enforced and loose cultures, which are much more open in terms of what members of that culture are enabled to do. And what she shows is that these, and this is very ecological, when we talk about cultures adapting to their environment, there's different environments, it's a multiple niche environment out there. And some environments call for much more collective action than others. It's really, really important for those cultures to behave in a coordinated fashion.

What's the threat? The threat might be warfare, but it might also be disease. Some cultures have pandemics much more in their histories than other cultures. And so whenever cultures have a history of collective threat those cultures tend to become tight cultures and then they're really good at collective action. Maybe not so good at innovation, but good at collective action. If it's a safe, secure environment then it's not so important for everyone to march in lock step. And so then those cultures become loose, which have their own advantages. And now if you look at that, and she's written extensively on the pandemic. The pandemic was a natural experiment. We have 195 nations or whatever, all responding to the pandemic in different ways, which ones did well? Which ones did poorly? There's a whole burst of research on that topic.

And the tight-loose continuum has much to do with it, although it is complex. Because on the one hand you need coordinated action, and there you see the failure of the loose cultures, Brazil, America, Italy at first, the UK, these are all loose cultures and they just didn't know, you know the problem there. And it was the tighter cultures that were able to respond collectively. But on the other hand, because this was a new challenge there had to be innovation. And so what Michelle says is there has to be some kind of ambidexterity, there has to be, we have to be tight in some respects and loose in others. That's what we need, which is not so easy. And of course in many ways we need to evolve that. That's something we need to bring into being, it doesn't automatically exist.

But the idea that it's a multiple niche environment out there and that cultures are adapted to different niches. And that part of that is, has to be the need for collective action. I think just makes what we do richer, because it's not just a matter of just one niche. It's a matter of many different niches. So that's a complication, but I think it's a very important complication.

FH: Well maybe I want to make one connection with one of the theories of consciousness, the adaptive resonance theory, which is a little bit of our favorite, even though it's a less well known one. There is this famous stability-plasticity dilemma, which is actually something that comes from neural networks. The neural network needs to learn from what it experiences, learning means storing things in memory, meaning that they reliably stay in memory. So when you need to know it you can fetch it and you can be sure that the knowledge is still there. But learning also means adapting to new information, and so the stability-plasticity dilemma is if you're too stable then you keep all the old knowledge, but you're not quick to assimilate new knowledge. If you're too plastic you will constantly pick up the latest things, but you will forget the long term things. So what you're discovering about these different kind of societies is a little bit like you have the societies more on the plastic side that are quick to adopt new things, and you have societies that are more on the stable side, that keep to the things that have proven their worth.

But ideally of course, what consciousness should do is solve the trade off and be able to distinguish those things that are likely to recur, that means that should be safely stored, and those things that are likely to be flukes of the moment, and that means you don't store them stably. But that's of course not easy to say when something happens for the first time, if it happens for the first time it may be the beginning of a long recurrent process, or maybe just be a fluke. So there is no absolute solution to the problem, but there are some heuristics which the brain has learned to distinguish between things that are likely to recur and therefore need to be stably stored, and things that are just incidental, and that you don't need to pay attention to. And the stability-plasticity dilemma is to make the right choice in that respect.

DSW: I want to bring in the continuum from conservatism to liberalism, or progressivism as a great example of this. And the idea I think to have that balance that you're talking about you actually need to have a conservative element to society and a liberal element to society. They have a positive relationship with each other, even though they might seem oppositional in the minds of the people. So I think it's a good example of something which is adaptive at the level of the whole culture, a mix of conservatives and progressives. Nobody might see it that way in their own minds, but it is a cultural level adaptation I think is an interesting way to think about that.

And also just to add, there's a fascinating business literature on this, as it turns out most businesses are not very adaptable. And if you look at the most profitable businesses, like the Fortune 500 businesses of 20 years ago, almost none of them remain in the Fortune 500. They go under and they're replaced by new businesses. The innovation is of the creative destruction variety, businesses failing and being replaced by new businesses. And the number of businesses that are actually capable of innovating and remaining alive as businesses are adaptable within their organizations, is very few. There are some that you can find, but for the most part businesses are pretty static. And the cultural evolution that takes place is through the turnover of businesses. I think that's pretty interesting.

Well, let's talk about Wikipedia. Wikipedia is always held up as an example of some great thing, an example of the Noosphere which is in some ways self-organizing. And yet when you look at it, and I think both of you probably know quite a lot about Wikipedia. You see that a lot of regulation has to take place in order for it to function. And so I'm eager to know, or basically to have your own interpretations of Wikipedia in particular as something which, on the one hand, is distributed and self-organizing, and yet on the other hand needs a lot of oversight for it to be the storehouse of knowledge, relatively reliable knowledge, that it is. Can you comment on that blend of system level oversight and bottom-up generativity?

SB: I think for me Wikipedia is... I mean, I read a book, when I was doing my Ph.D. From, I think Clay Shirky, I hope that I pronounce his name correctly. It was about Wikipedia and the name of the book was Here Comes Everybody. So everybody could become someone in this book, but well, actually exactly what you mentioned, that there are rules to follow on how actually the digital revolution that we are experiencing and decentralization that is happening. It's not about creating disconnection, it's about creating better connections. So decentralization means... It doesn't mean disconnection, it means better connection, if I can summarize it that way. So I think Wikipedia is maybe a good example of a self-organizing system that organizes on a set of agreements that are being put into place that might lead as a good example.

Of course, not all pages on Wikipedia or of high quality, but pages that are highly visited and highly edited, I think could be a form of, I think, agents, or maybe I can call that people becoming or accepting responsibility of being a part of a greater system and wanting that system to work better for themselves and for everyone. So it's an act of... I think, also at the same time saying that in order to create a, not perfect, but an adaptive system, it doesn't need to get rid of the central control mechanism. It's a perfect balance or kind of balance between a degree of decentralization and bottom up movement, and informal links in your system. At the same time, a general regulation and control mechanism that can create an environment that creates rich and meaningful connection. This is my thinking on Wikipedia.

DSW: And I call that bottom-up and enlightened top-down. So, Francis tell us about Wikipedia and especially the regulatory aspect of it, but the incentive to cheat. We're talking about false information. Well, I mean, there's so much incentive to add false information to Wikipedia. What prevents that to the degree that it does?

FH: Wikipedia actually is I think more bottom-up than centralized, but it has a beautiful solution to this stability-plasticity dilemma. So the stability is that you want to keep the good knowledge in Wikipedia. The plasticity is that you would want anybody who has some idea, that is relevant to Wikipedia to be

able to add that easily. The good thing about Wikipedia is that it is kind of a memory that everybody can write on, which means you can erase things that people have done before. But you can always restore what was done earlier. So it's because of the versioning system that nothing gets lost in Wikipedia. Whatever anybody has written, at any stage, on any page on Wikipedia can in principle be recovered.

So what is the normal dynamics? Somebody writes something about the topic. Somebody else reads it and thinks that, in some way, whatever he read is not perfect. So either something needs to be added, that's a more common view or something that you wrote he considers incorrect or not well-formulated, so he corrects that. And then somebody else does the same, somebody else does the same, and somebody else does the same. So it's a kind of a process of variation, selection. Everybody adds a little bit of variation, but will to some degree maybe remove things that others have done before, which is selection. But the variation selection here is completely distributed, which means it's actually the largest group that does it. And what you will typically find is that those things that are obviously false, they get eliminated sooner or later.

Now, when you speak about centralized control, there is some degree of centralization now that wasn't there in the beginning of Wikipedia. Because I've seen Wikipedia start from the very beginning, I was among the first who was writing articles, is that now you have a kind of a class of people who call themselves editors and who know the workings of Wikipedia better, who know the etiquette, who know the rules and who will be more careful in making sure that people don't add false news, et cetera.

But even before these people were there, Wikipedia functioned pretty well. If, let's say on the page on the landing of the moon, somebody would write it's all fake, they have never landed on the moon. Then somebody else would either immediately eliminate it or put a reference, XYZ has claimed that the landing was all fake, but here are the following arguments to show that this a fake story cannot work. So Wikipedia just accumulates good things and occasionally eliminates bad things. But it is a memory on which you can build. You build further on what's there and that means occasionally destroying something. But most of the time, it's an accumulation of memory.

DSW: I think that account, which was a great account Francis, I think it underestimates the forces of false information. I mean, sometimes the false information is just false, that gets weeded out because nobody has a vested interest. But when vested interests are at stake, now there's going to be real pressure to insert biased information into something like that. And that pressure has to be opposed in some way. Just take a polarized situation and just imagine them all trying to pump in their information into Wikipedia. There has to be some process that pumps it out, or that prevents that from... In other words, there has to be a stronger immune system. It's not just a matter of bad versus good information. It's a matter of the equivalent of disease organisms that are actively trying to invade and so we have to pay more attention to the concept of an immune system that protects against very smart, very effective, enemy strategies of some kind or another. That's what I think needs to be an important part of everything that we talk about. It's not just a matter of good versus bad information. It's a matter of managing this, these really strong, strong, oppositional forces. And now Wikipedia presumably has something like that.

FH: But these oppositional forces are much more limited than you make it look. Most pages on Wikipedia are about pretty neutral topics, about a particular record and who played on that record; about a particular scientific theory and what are the different equations of it; they are about a particular geographical location, which views are in a particular city. Most of these things that are not controversial. So there is no opposition. When you have something like, let's say a typical example is the Armenian genocide. In the Armenian genocide, the Turks will claim in all possible ways that it didn't happen. The Armenians will, in all possible ways, claim that it did happen. So you typically will have what is called an edit war. So I'm sure that the first page on the Armenian genocide, that a Turk immediately erased it, and then an Armenian immediately restored it, and a Turk immediately repeated it. And then,

what you get is that, after a while, it settles down like that in the Armenian genocide; there will be an Armenian version of the story and there will be a Turkish version of the story. And that's the way that Wikipedia makes compromise. It's like, if there are two versions, that really we cannot be synthesized then, Wikipedia just says Person A believes this and Person B believes that, and that is one way to solve the problem.

DSW: So that would be true for American history? Take patriotic versions of American history. So there's a patriotic version and a more scholarly version. I mean, there's so many.

FH: In the days of the Gulf war, George W. Bush was quite controversial, and there were people who loved him, and there were people who hated him. And so there was quite an edit war about George W. Bush. But in the end, the Wikipedia policies just keep up objective facts or facts that can be traced to a particular source. And then you can say, this journalist has claimed that George W. Bush was lying when he said this. Well, this spokesman of the White House said that George W. Bush said this because of this. That's how these things got resolved.

DSW: So basically there are scholarly standards or there are journalistic standards that are applied. Shima, do you have anything to add to this?

SB: I think something just to add, very shortly, I think the example of Wikipedia cannot be generalized because it's Wikipedia. Wikipedia is limited to the format and the setting that it has. So it's easy to have a set of rules and objectives on Wikipedia. But if we want to take it like be inspired and apply some of those to the Noosphere, well, having narratives that would bring mass consciousness, that certain ideas indeed are toxic for the global community, certain ideas are actually leading us to more segregation and also polarization. If you want to live in a planet or in a global community, that's more sustainable, more inclusive, basically, I think we need to search for common ground. We need to look for common ground. Even though that we might have different points of view or ideas, you're still sharing the same kind of Noosphere. And I think bringing the conversation and narrative in that direction would contribute to what you mentioned about the immune system of the noosphere. How can we make it strong by actually bringing awareness that certain ideas indeed harm all of us? Even some of us might not believe them, but we are being exposed to them by virtue of being a part of this whole.

DSW: Well, I'd like to finish up by the need, of course, to improve our situation. Because there's so much that is not working, basically. So much that's not adaptive. How do we make it more adaptive? And one point I want to make is that this is work that's required at all scales. It's not just that we need to increase the scale of cooperation and all of that. If you look at any scale, you'll find, actually what you'll find is variation. Look at the city scale, which Shima I know is your special interest. Cities vary in how well they function as adaptive units. Some do well, others do very poorly, most are in between.

I work at the scale of small groups, any group of people that are trying to get things done, any team, anything, no matter how small. Every couple, two people are a group. And if you look at that scale, you find variation, some do spectacularly, some meltdown, and most are muddling along in between. And so at all scales, we have improvements that can be made. And then especially at the global scale, as we go up in scale, then we increasingly enter a zone where lots of improvements need to be made.

And so at any scale: cities, small groups, the global village, what's the process whereby we make things better? And I want to maybe have each of you answer that broad question, and then I'll wrap it up with my own answer to that question. At any scale we choose to operate on, what's required to improve? There's always room for improvement. So what's required for improvement at any scale in a real-world setting? Shima, why don't you go first?

SB: A quote came to my mind is that change begins by a local process. So you are the change in the world. I think it's just, I see it like that. Basically if I want to change the world, my manifesto for myself is to actually, I need to change myself. Because I am the one that is observing this experience of life. And I

am experiencing things that I don't like. So I ask myself, can I be a solution? So instead of just, I think the previous paradigm that we were living, has a lot of problems, so how can we create solution oriented systems? How I can be a solution to any kind of relationship that I'm entering, whether it's a relationship with a partner or whether it's a relationship with a cat or with a dog, or with a tree. So looking at myself as a relational being, something that is connected to multiple layers of this experience of life, and then how I can become a solution, how I can become change myself. This is how I see it.

FH: Okay, I think this is maybe the occasion to summarize another idea in our paper that is, how do we deal with all these problems that we have identified on the Internet? The conspiracy theories, the false news, et cetera, all the confusion. And there we thought of two strategies.

The first strategy is to better understand the dynamics of all these things. The dynamics that depend on a wide range of factors. Personal psychology, for example. People tend to be much more close-minded whenever they feel afraid of something, whenever there's something negative. Memetics, we already spoke about how memes propagate and which memes are more likely to propagate than others. The different algorithms that sites like Facebook use to determine what news you get. All of these, have an effect on how memes spread. Various social norms. What you need to have a design for the Noosphere is to look at all these factors that influence these dynamics.

Why is it important? Not only scientifically to understand what's happening, but once you see what is happening, then you potentially can intervene in it. If you see that, for example, certain dynamics, consistently lead to bad results. Famous example are the echo chambers that lead to polarization, then you can start developing norms to prevent that. Norms that could take the form of some kind of a netiquette, that could take the form if necessary of a law that for example, would forbid Facebook to use certain types of algorithms, or that maybe could be formulated as kind of general ethical norms that we try to educate people into— don't behave like this on the Internet, because it's not good for you or for anybody.

So that's one approach is understanding the dynamics of what's going on and using that to formulate new norms and rules to make it work better.

But the other thing we thought about was that, if you want people to get a more healthy view, they need to have this overview, this narrative, this famous Third Story. They need to have a kind of a broad world view that allows them to make sense of what's going on in the world. The problem now is we are bombarded with information, most of which is pretty negative. Most of which is highly fragmented. Most of which is completely changing from one moment to another. Shima likes to use the VUCA acronym, which means volatile, uncertain, complex, and ambiguous. So we are in a VUCA world. Everything changes all the time. It's uncertain, it's ambiguous, it's complex. That means that people just lose the sense that they understand what's going on.

So you need to again, give them a sense of what's happening, is not random. It's not just the world coming to an end. It is part of an evolutionary process that may be complex, but that has some kind of a soul. There is some kind of driving direction and this driving direction—that is the Third Story. And I think that part of what we need to do in this project, is to formulate this Third Story in a form that can stretch across the Internet across the noosphere, that is something that is sufficiently concrete, that let's say non-scientists would be inspired by it.

So if you ask me what to do about all the pathologies, I would say first understanding what are the factors that accelerate these pathologies. Second, provide an alternative in the form of a Third Story that gives people again a sense of belonging to some larger whole that is evolving in a positive way.

DSW: That's great, both of you. I'm so happy that you brought the narrative up, Francis, and what I'll add to that is the need for constant experimentation. Because even with that narrative, when we decide to do something to make that better, we don't really know if it's going to work, because the world is so

complex. And so that means we have to experiment with the welfare of the whole earth in mind, basically. We're part of something larger than ourselves. That thing is the whole earth, the whole earth system. And as to what we do at any scale, large or small, we have to experiment. And what is experimentation but a conscious form of evolution? That's all it is. Experimentation is a form of conscious evolution. And I think the word conscious there comes in, in such a straightforward way. When we talk about consciousness, it can get so very complex and mechanistic and so on.

But when we talk about it this way, that basically we need to experiment. We need to be mindful about what we're working towards. We need to try stuff out with the best of our knowledge and then we select what works with prosocial goals in mind. That's an everyday meaning of consciousness, which is the most important meaning, because it's just so simple and what we need to do.

So, this is awesome. And so happy to talk with both of you together and I'll be having separate conversations with you both. As well, but thank you so much for taking the time.

SB: Thank you very much for invitation. And also it was great to talk with you and be with you. Thank you.

FH: The same for me.