Nate Hagens (00:00:02):

You're listening to The Great Simplification with Nate Hagens. That's me. On this show, we try to explore and simplify what's happening with energy, the economy, the environment, and our society. Together with scientists, experts, and leaders, this show is about understanding the bird's eye view of how everything fits together, where we go from here, and what we can do about it as a society and as individuals.

(00:00:33):

Please welcome a return to this show my Australian colleague Simon Michaux. Simon currently works for the government of Finland in their mining geology division called GTK. Simon and I previously had a conversation called Minerals Blindness, which complimented the term often used on this podcast, energy blindness. Simon Returns today to give an overview on given the biophysical constraints that we face, how do we think about solutions? And what would be a preliminary framework for research and societal interventions for what we face?

(00:01:17):

If you haven't noticed, Simon not only possesses a polymath mind. But he is quite a character, and I expect that he will be back often on this show as we've become good friends or mates as he would say. Please welcome my friend Simon Michaux.

(00:01:36):

Hyvää huomenta, Simon

Simon Michaux (00:01:36):

Hyvää huomenta, Nate

Nate Hagens (00:01:52):

Which is Australian for good day, mate.

Simon Michaux (00:01:56):

In Finland it's good morning.

Nate Hagens (00:01:58):

Yes. Well, it's good morning for me, but you're in the afternoon now.

Simon Michaux (00:02:01):

Yes, 4:00 PM.

Nate Hagens (00:02:04):

How are you my friend?

Simon Michaux (00:02:06):

Life is good. Life is busy. Life is very busy. Yes.

Nate Hagens (00:02:13):

So since the first podcast that we did, I came to Finland to present with you to government and industry professionals on the human predicament and the infrastructure situation. So that has been kind of like kicking a hornet's nest. You've become very busy.

Simon Michaux (00:02:35):

Yes. So what happened? Finland's a remarkable place where when something is said, especially when it's said with data backed analysis, it is discussed. It is not ignored. And what has happened is the work has been passed around. And I've been invited to go and speak at multiple levels of the Finnish and Swedish government now. And they're taking it very seriously because Finland has committed to being fossil fuel free, or at least carbon neutral by 2035. And they've now actually starting to get their arms around the mechanics of that plan. And they're realizing the scale of what they're undertaking. And so they're taking it very seriously. And I'm now presenting my work four and five times a week to someone.

Nate Hagens (00:03:25):

And I didn't know until I got there. By the way, I had such a lovely time there. What a beautiful, slower-paced, sane culture. Although I was only there for a couple days. And thank you for hosting me. I didn't know that Finland is so close to being fossil fuel free relative to other countries, even though you and I think we will probably be optimizing for energy security and basic needs over carbon, but it's still impressive.

Simon Michaux (00:04:00):

So 80% of our electricity is coming from non fossil fuel systems already. We're importing a lot of energy from Russia, we're importing from Russia and Sweden. But 80% of the sector is already off fossil fuels. Our entire transport sector is fossil fuels. And that's actually the main challenge.

(00:04:23):

But we've got a lot of heavy industry here like smelters and factories, and they're all running on non fossils fuel energy. And so we can actually run an industrial sector without fossil fuels right now, which is amazing.

Nate Hagens (00:04:36):

Right. So we're going to get into that. Here's what I'd like to cover today. In our first conversation, we highlighted that not only is modern culture energy blind, but also minerals and materials blind, which is your area of expertise. And given your recent popularity, you've been on Australian mainstream news and speaking to all kinds of people in governments in Europe, I think more and more people can't help but be aware of our natural resource and environmental constraints. But I think there's soon going to be a giant clamoring for answers or at least direction of where we need to go.

(00:05:24):

So today what I'd like to do, if you're willing, is start to construct a framework for how we start to prepare for what's ahead. What is the hard work that's going to make need to be done? And what are the buckets that people and governments need to focus on? So that's what I'd like to talk about. But in case people missed the first episode and the intervening months in between, maybe you could give a five-minute elevator pitch of how we got here as a society, and the current constraints from a biophysical perspective.

Simon Michaux (00:06:01):

Sure. So that conversation's already started. I'm already hearing people are digesting this, they're understanding it, and they're doing the math very quickly. And now they're coming after me and they're deadly serious. They want a plan, and they're starting to talk to each other. So this is very timely.

(00:06:18):

So where we got to last time? Well, so I described the idea that over the last 150 years, we built an industrial ecosystem that is amazingly complex. And it was actually built using really, really dense energy and oil. And it was built and optimized around cheap abundant energy like we'd never seen, but also free and easy available credit and capital. And also the idea that all mineral resources are abundant, it's just a matter of digging them up. So that's where we've got to, but we've taken those things so much for granted that we don't even see them anymore. Energy blind, minerals blind.

(00:07:01):

So now we are in a situation where we want to build a new system. And that system is going to be built with really, really fragile and expensive energy. No sorry, ineffective and expensive energy using a fragile finance system. It's probably a better way to say it. So our finance sector is not in a fit state to engage in industrial reform. And now we're also finding because energy's becoming a problem, and natural resources are decreasing in grade, and getting harder to get hold of. So our ability to bring more resources online are getting harder and harder.

(00:07:35):

At the same time, we have a massive pollution stream that is historically unprecedented and an environment that is deteriorating, that's the only way to describe it. Deteriorating at all levels. And we've got an unprecedented number of human population embedded in this system. So we've got a massive challenge, and our tools to meet this challenge simply, we're just unprepared. And so we need to actually change our paradigm quick start.

(00:08:04):

And so fossil fuels is our energy system that we've developed so far. They're becoming unreliable. It's not just concepts like peak oil. There's a whole host of above ground problems, which means not managing the below ground resources very effectively or very intelligently. And we are now sort of seeing in Europe for example, gas in particular has become politicized and weaponized. And that's actually having a direct effect on our industrialization.

(00:08:33):

I believe all three fossil fuels have a purpose that we don't really understand until they're gone. Manufacturing is absolutely dependent on coal. The heating of coal, if we phase out coal, we lose a lot of our manufacturer, with no viable substitute. Gas is a similar problem. We can't balance our power grid without it. Supply and demand must balance. And we won't be able to send large quantities of energy into remote areas through a gas pipeline.

(00:09:00):

And then there's oil, which we're a petroleum driven society. Our plans to actually phase out petroleum, internal combustion engine technology is not going to go so well, because we actually don't have the plans to do so. We don't have the mineral resources in the ground to deploy enough of those vehicles in time. So how to actually put this, our plan was not thought through in context of the time needed, our industrial capacity, and our ability to supply the raw materials needed. And so a new plan is needed and a new paradigm is needed. What would you add to that?

Nate Hagens (00:09:46):

Well, I would add a lot. But that's a pretty darn good summary. I mean, I think I would add complexity and the fragility of six continent supply chain. The inability of global leaders to actually say some of the things that you're saying, because that would cause a phase shift in how we approach the resource situation.

(00:10:12):

I would add that everything is optimized for growth, and we will kick any possible can forward. So the default would be to grow a bigger global system using more fossil fuels and more renewables, even with renewables growing at a faster rate. And in the process of decarbonizing our energy source, as you pointed out, we will re-materialize our mineral product source on the manufacturing side. So we're pushing against multiple limits.

(00:10:51):

And I think what I would add is if we had made this shift 50 years ago, it could have been a gradual year on year thing. But now, because we've kicked so many cans, we're in this financial cul-de-sac. And we're going to kind of be in this era the way that we are now, until we're not. And the until we're not part will come suddenly, and it will be sharp. And then we're going to have to hopefully have things on the ground and responses in motion, because it's not going to be a couple percent a drop because of the financial system. Because we had lower productivity on energy, more costly energy, and lower productivity on minerals. Lithium is eight times what it was a few years ago. We're offsetting those productivity declines by adding more debt. And eventually, we won't be able to add more debt and then we kind of have a musical chair situation. But other than that, I think you said it quite well.

(00:11:56):

Although what you and I just said compared to the global narratives like net zero by 2050 is maybe blasphemy. It's almost a completely different worldview. And so the net zero very common McKinsey sort of governmental forecast is very different than what we're saying. And I don't think both can be true. Can you maybe shed some speculation to our listeners on how the difference is between these?

Because who's right on these scenarios has huge inferences for what we should be preparing and working on.

Simon Michaux (00:12:44):

So one thing we could add is neoclassical economics was the dominant paradigm for the last century or so. And that's based on growth based economics. Growth is based on energy consumption. Our energy sector... Like peak oil could be November 2018. We won't really know that until November 2023, five years after. But if it's true, then our energy sector is now shrinking. And all renewable energy systems after this have a lower energy return on energy invest. So the economic system that the net zero plan is dependent upon actually won't work anymore. Growth-based economics is being phased out and is being replaced by something else.

Nate Hagens (00:13:30):

But the proponents of net zero would say that oil peaking is irrelevant. That's a good thing because we're going to replace it with technology.

Simon Michaux (00:13:41):

Yes, they might say that. But they haven't done it yet. But less than 1% of the global fleet at the moment is non-fossil fuel electric vehicle or hydrogen fuel cell renewal. Energy is 8% of your primary energy, most of the non fossil fuel system has not been built yet. And it hasn't been built yet, you've got to go and build it. And so it takes time and money to do that, neither of which we actually have.

Nate Hagens (00:14:09):

And energy and materials.

Simon Michaux (00:14:11):

Yeah. And so the net zero plan, one of the criticism against my work is I'm using a four-week buffer for wind and solar power and that is to make wind and solar viable. Because they're highly intermittent. So their plan is to use five to seven hours. And what they're doing when you look at it, they're looking at day to day fluctuations in demand, and then shifting things around accordingly. And so they-

Nate Hagens (00:14:37):

So they acknowledge that renewables are intermittent? And in order to accommodate for that, they build into their assumptions five to seven hours of backup batteries or whatever?

Simon Michaux (00:14:52):

But that's going to shift things around in a single 24 hour cycle. Right now the problem is on the supply side, wind in particular can vary. These massive peaks and these massive troughs that go for days and sometimes weeks. And if that's actually wind and solar is 70% of our power grid, then we're going to need an enormous buffer. And so I thought my numbers were quite conservative, but some of the

thinking behind net zero is not supply based. And there's no resource estimates on whether any of this is viable anyway.

Nate Hagens (00:15:23):

Isn't the biggest elephant in the room... And in yours and my work over the last couple decades, we've come to recognize there are many elephants in the room. But isn't the big one that all of these technology and societal assumptions that are kind of benign and we can have our cake and eat it to, based on this invisible subsidy of more primary energy underpinning the human economy the last century, pretty much every year. And so once that primary energy and oil, and many people on my podcast have articulated is the master resource. That once oil starts to decline, it will raise the prices and costs of all the other things. And then energetic remoteness comes into play, which is things that we assumed we could get for X dollars, are now X times two or three. Because energy ripples through the entire global industrial manufacturing chain.

Simon Michaux (00:16:32):

So I was explaining this to some young kids a couple days ago. They're all 14 and 15. The way I summarize it to them was for the last 50 years, we've done a lot of our innovation problem solving through ideology. That is we believe we can balance their budget just by printing more money. We don't have to meet reality if we don't want to. So the current world is the belief that if we think something is irrelevant, then it is. And we haven't had to look at material restraints for a very long time.

(00:17:10):

And from a thermodynamic point of view, like thermal entropy of industry, the system's been trying to change now for about 20 years, or 17 years actually by my account since 2005. And we keep intervening to stop that change happening, and the system's trying to find a new equilibrium. Because we ideologically believe things should never change, but the rug's being pulled out from under our feet.

Nate Hagens (00:17:36):

But I totally agree with that. With the addition of that finance central bank guarantees, and quantitative easing, and more debt, and all that acts as a buffer so that we don't see the material and resource disconnect. It is hidden from us because of this financial short term finger in the dike as it were.

Simon Michaux (00:18:00):

For 50 years. We haven't seen it for 50 years. When Britain was shut down, they shut down because the United States government was approaching insolvency, and that was their response that. And they were putting out a fire when they did that, and this was their plan. And so yes, here we are.

Nate Hagens (00:18:19):

Okay, here we are. We won't belabor the conclusions. The inferences are clear. We're going to have to have some sort of a lower biophysical throughput existence in the future. And I think most people

listening to this show either completely understand that or subconsciously intuit that, because the signs are becoming obvious.

(00:18:45):

So before we get into your framework on what we should be working on, how do we first even think about responding? How do you organize your thinking with this challenge, before you get to the what to do?

Simon Michaux (00:19:01):

So I've been part of quite a few groups over the years to try and of meet this problem, and there are lots of ways to do this. But what is clear to me is a new social contractors coming where the human species is evolving both as a species, as a group, but also each of us individually.

(00:19:18):

So we've got to understand that things have changed. We have yet to understand how they're changing. So in this shifting environment, we've got to assess what's absolutely needed for society to function, and work backwards from there. And current assumptions aren't useful. Current assumptions of I want a new iPhone every year. That's not a sensible assumption. What do we really need? So we've got to establish our priorities.

(00:19:46):

And then there's three levels if you will. There's this short term. What do I need in the short term? What do we need in the short term? And who is we? Then there's a medium term. What do we need in the next five, 10 years? And then there's the long term. 50 years from now, what will humanity need to actually function?

(00:20:08):

And so there is a shift. And there's three parts to this. There's first we've got to understand the nature of the challenge. And even after all this talk for 20 years, we are still getting our arms around this. So we've got to get our arms around, but then everyone's got to do that. So understand the nature of the challenge.

(00:20:28):

Then we've got to understand given those challenges, what are our true limitations? And that part has yet to come. What can we and can't we really do given the challenges we listed off?

(00:20:42):

And then the third part is for the first time, we can actually develop a plan. And that's yet to come too. So these are the steps and hoops that we've got to jump through, not only as a species, but individuals as well. And we've all got to do it. One or two people can't do it, we've all must do it together. And that is another thing that doesn't happen at the moment. Everyone assumes someone else will do it for them.

Nate Hagens (00:21:06):

So have you developed such a hierarchy of the things that we're absolutely going to need?

Simon Michaux (00:21:14):

Yeah. So I started thinking about it. If I have a plan, that's okay. But we've got to put it in the arena, and we've all got to discuss it, rip it apart, and put it back together. So my plan becomes our plan. So I'm putting forward some ideas, but I see this as the start of the conversation, not the actual solution.

(00:21:36):

So what I've done here is when we often talk about say the Maslow hierarchy of needs, this is about what do we absolutely need in order of priority? And usually that is for a human being or a human society. But what if we projected that thinking onto several sectors? Because at the moment, the Maslow hierarchy of needs was based around what happens in an emergency. And they talk about things like food, water, security, and what have you. But all those things are industrially and technologically delivered to us now. We need for example our systems to deliver us our food and our water is piped to us.

(00:22:22):

So Maslow's hierarchy of needs is now projected onto a couple of sectors. And so what I've got is what the Maslow's hierarchy of needs for our energy systems? What do our energy systems absolutely need to function? And then step down from there. And what I'm saying there is how much power are we actually wasting at the moment? When we walk around at night, all the cities are lit up. We're a very wasteful society, because energy is considered almost irrelevant.

(00:22:50):

So what is the Maslow hierarchy of needs for food systems? What do we absolutely need to deliver for our food systems from the point of view of food, to deliver the target of feeding our society? Then there's water, fresh potable water that's actually good enough to drink. Sewage sanitation. That's not something that's actually talked about a lot, but if we lose our ability to manage sewage and sanitation, we'll start having disease problems that we don't normally see in a developed society.

(00:23:23):

Something that happens in the northern hemisphere that is not really understood in the southern hemisphere is heating. So the Maslow's hierarchy of needs for heating. And lastly is industry. Industry, manufacturer smelting, mining. That's all seen as an afterthought for now. But our long term human survival is actually dependent on that industry actually being developed, and allowed to continue.

Nate Hagens (00:23:50):

Just to throw a question in there, especially given the climate forecast, you mentioned heating. What about cooling?

Simon Michaux (00:24:00):

So again, that requires power as well. So yeah, the answer is yes. There are parts of the world for example... I used to live in Australia and I used to work out in remote exploration as a exploration geophysicist. And I used to be operating in 40 degree heat, and that's not very nice. And we used to put

up with it because it's only for a few months of the year, it'll be fine. But what happens if that increased, and how do we manage that? So yes, but that will require energy too and systems.

Nate Hagens (00:24:34):

Okay. So you have seven categories. You said energy, food, water, sewage, heating, and industry. Six categories. So we're going to get back to those and take a deep dive or at least a shallow dive in this conversation on those categories. But getting back to the overall aerial view, I often use Marvin Harris research on the three levels of intervention super structure. Which is our ideas, our beliefs, cultural conversations, the social structure, which is the political economy, and the rules and institutions. And on the bottom, and what Marvin Harris said was the most important thing projecting the viability of a historical cultures is infrastructure, which is your expertise. But before we get into the infrastructure part, how do you envision society at the higher levels of belief, motivation, institutions? Have you thought about that?

Simon Michaux (00:25:47):

Yes. So I believe society will shift into four parallel groups based on paradigm. And there are other thoughts for example, like how do our levels of government respond to this? Is there a difference between the federal government versus the local council? And the answer is yes. Yes, absolutely.

(00:26:09):

So the four social groups, they're all paradigms. Like when you go meet with like-minded people, so there's four groups. The first group is the group I call the old school. And they're going to old school where they want to see things that they believe the existing system and the way of doing things will continue is just a short term blip. And we should just not panic, and not do any doom mongering or fear-mongering like that and stop trying to change things. We just need to knuckle down and it'll get better eventually. And they will hang on to the bitter, bitter end. And there's nothing we can actually do with them. We've all tried to explain and talk to people like this. They just point blank refuse to see some of these issues.

Nate Hagens (00:27:02):

Is that the majority of society?

Simon Michaux (00:27:06):

I would guess it's something like at the moment, say two thirds, maybe three quarters of society like that. But what's interesting is 20 years ago would've been 95% of society. So the proportions are changing.

(00:27:21):

But in that includes for example, some of the climate change activists that I've met at the moment who believe for example, that we should just shut down fossil fuels tomorrow. All gone, finished. And we should not do any mining either.

Nate Hagens (00:27:35):

Which is a death sentence for billions were it actually to happen. But it's not going to happen.

Simon Michaux (00:27:40):

Yeah, we would usher in a new dark age. Now these people mean well, but what it means is they've got one part of the problem, Nate. They haven't touched on the other problems together. So all problems need to be put on the table at the same time and all solutions need to be put on the same time. And all stakeholders need to be around the table, and we need to join hands, and actually have an adult conversation

Nate Hagens (00:28:04):

There's a word for that.

Simon Michaux (00:28:06):

Yeah,

Nate Hagens (00:28:07):

Triage.

Simon Michaux (00:28:09):

Yes, actually. Yes. Very good. Right. So that's the first group, the old school. The second group is... I was talking to a friend of ours Steve Keen and he actually pointed this out to me. The second group is the Vikings. The Vikings are the group of people who are not interested in doing the work to create a new system. They understand the old system's coming apart, but they will take what they want while they can. So they'll go out and take stuff from other communities. We're seeing this in some forms at a global scale now.

(00:28:51):

And there's time scales here, like the Vikings for example, they seem to have wonderful week perspective. I need food, let's go and steal some. In my opinion, this group will educate everyone else in the benefit of working together and the need to be self-sufficient, right? So I don't believe they'll last very long. Because after they've taken everything, and now what? Someone's got to go and make new stuff. And the difficulties involved with that and the ability to go and take other people's things may also become difficult. So at some point, I do believe it's a short term phenomenon as society at large comes through this transition.

(00:29:35):

The third group who I call the realists. This is the prepper community. What are the short term needs of society? The next one to five years in a seasonal perspective. How do we get our food? How do we maintain our water? How do we manage our medical problems and disease? How do we manufacture our pharmaceuticals? How do we keep society alive? The realists.

(00:30:01):

And that brings us to the fourth group, which I believe you and I are part of or, would like to think so. I call them the Arcadians. Now the Arcadians think long term how do we build a new society that is genuinely wise? How do we learn what we need to learn, and help humanity come through this adolescence, face these problems, and become a truly sustainable society on the other side of this transition? And what do we have to learn?

(00:30:32):

This is an internal and almost spiritual evolution. We let go of materialism. We learn the idea that we have to have a genuine and respectful relationship with the planetary environment. We understand the purpose of thinking for ourselves, taking responsibility for our actions, and meaning what we say at all levels. If that is translated into society architecture, what does that look like?

(00:30:57):

Now because of the challenges in front of us, this is a proposition that might be 50 to 100 years long. So the people who are actually involved in doing that might do a lot of work, but they'll never see the outcome. It's for their grandchildren, or their great-grandchildren.

Nate Hagens (00:31:14):

I like it. DJ and I's first book was called The Bottlenecks of the 21st Century. And it is exactly that, trying to propel things of value through the upcoming constraints in the coming 100 years. So using your terminology, the purpose of this podcast is to increase the number of people that are in this Arcadian camp.

Simon Michaux (00:31:40):

Before we move on, the Arcadians exist now for a reason. But I think a case can be made that this had to happen. We were never, ever, ever going to do this the easy way where we learned for example, we could have seen this back in the early 1900s. We didn't, right? We could have changed at the end of World War II. We could have changed in 1970. We didn't. Why? We always took the easy way out. It's like a dopamine hit. Your work has been excellent at describing that.

Nate Hagens (00:32:11):

And we no longer have any easy way out, so we're going to be forced to do this. It kind of had to happen this way.

Simon Michaux (00:32:17):

Right. And so at this time, we have a large proportion of the population are educated where you have the idea that both men and women have equal rights and are educated, and that our opinions matter. We have technology at far more advanced than ever before. Our ability to handle information and transfer it to each other is unprecedented as well.

(00:32:42):

So not only is the challenge unprecedentedly hard, and the generation coming in has to be stronger than the generation that fought World War II. But the generation we have at the moment for all its faults and flaws that are there, we are in better shape to meet these challenges than anyone before us. So it was always going to be this way. And we are the heroes that we've always wanted to. We just didn't know it. And now we have no choice anyway.

Nate Hagens (00:33:14):

Well, I'm not sure if that's why you chose to wear your Superman shirt today. I thought it was because it was Halloween. I also am wearing a Halloween costume. I'm going as a middle aged Wisconsin podcaster.

Simon Michaux (00:33:30):

Okay.

Nate Hagens (00:33:31):

Yes.

Simon Michaux (00:33:32):

Okay, well I actually wear this shirt to meetings.

Nate Hagens (00:33:37):

Do you really?

Simon Michaux (00:33:37):

I do. I've got a number of shirts that say.

Nate Hagens (00:33:40):

Your wardrobe, you've got a bunch of blue shirts on a hanger and they're all Superman shirts.

Simon Michaux (00:33:45):

No, no. I saved this for special meetings at work. So when it's a bit more casual.

Nate Hagens (00:33:54):

You and I have become close friends. And I really appreciate not only your intellect and wide spanning insights, but your humanity and your humor. Got dang, are you a funny human being. Your Facebook feed and the time we spent together. This is what it's about, man. You just dig down and be the best human you can be. And there's so many different things I want to talk to you about Simon. I just think on this second conversation, let's probably just circle around your Maslow hierarchy of needs to get more people thinking about the direction we need to go.

(00:34:36):

So I'm not sure how to proceed. I think what maybe we could do is those six categories you mentioned earlier, maybe you give a five to 10 minute overview of how you think about energy, food, water, sewage, heating, manufacturing. And then in the future, we come back and have a real deep dive on one of those or a different structure. But maybe for this conversation, would that make sense?

Simon Michaux (00:35:04):

There's a step before that, which I can add. So I'm actually undertaking some work at the moment. But like I'm saying, governments around me, officials are getting it. And they've actually asked me to construct a document where if I was to design a circular economy in context of the outcomes of my work, and in fact everyone like us, what would that look like? So they want a plan. And so the outcome of that is... Again, this is the idea of Maslow hierarchy of needs applied to different things. So there's an order to do things in.

(00:35:38):

And so the first order of business was to reshuffle and reorder our industry sites around energy hubs. Where is their energy coming from? And if we can't project it over such a long period of time, over a long distance anymore, how do we reorder our industry where each industrial site will be attached to other sites, where they function almost like an industrial version of an organic farm. The outputs of one industry unit and its waste plume inputs to another industrial unit, and they're all attached to the same energy system.

Nate Hagens (00:36:23):

So I think that's brilliant, but it comes with a risk that-

Simon Michaux (00:36:29):

Oh yes.

Nate Hagens (00:36:31):

Well, the risk that I see is the more people and the more countries and governments that recognize the logic of this, the sooner there's a phase shift that actually mortally wounds the super organism, and then the complexity and financial supports that we have for all of our nations kind of unravel before we're able to do the important work.

Simon Michaux (00:36:58):

So what would the super organism be within the four categories of... Would it be old school? Would it be a Viking? Would it be a realist or an Arcadian? What would the super organism be?

Nate Hagens (00:37:10):

Well, certainly wouldn't be an Arcadian because the super organism cares about right now, just getting enough profits to keep the financial system going. And the profits are tethered to energy. So the super organism would be a blend of category one and category two, the cornucopia and the Vikings.

Simon Michaux (00:37:30):

Yes, correct. So that is absolutely correct, but it will continue to do so while it can. So what our work is showing is very soon it can't. And so it's going to go through a death throws and any organism it will fight to survive. And so yes, there will be pushback and resistance. And so what I'm proposing is a plan, whether that plan gets carried out or whether it's allowed to be carried out, that's a different matter.

Nate Hagens (00:38:00):

And that's why I think this is so important. Firstly that you're championing this, but also that you're doing it from a Scandinavian country. Because the United States or China couldn't champion the plan that you're proposing. It's too vast and complex. But you have low population density, very good social structures, surplus, lots of natural resources, and universities that have the ability to research and do this.

Simon Michaux (00:38:34):

Yes. So they are actually listening. They're recognizing the problems you have put forward so as well. So first thing's first is we reorder the vital industrial hubs. Now yes, those industrial hubs will actually have to have decision makers what considers a vital hub. What's a vital activity? Then we need the people to actually operate those in industrial services. So you'll have a population inserted. Around that population, we have our food production and it all has to be local.

(00:39:05):

So you have now a series of localized, decentralized networks that are actually, you'll have a hub where everything balances, but in a local area. And what that looks like, or what I'm proposing it will look like is you have local decision making. Regional sourcing of stuff, see everything that we're actually going to produce industrially is sourced from a radio, say four or 500 kilometers. So two or 300 miles, whatever that is.

(00:39:33):

And on a global scale, we've got a global transfer of information. How we do stuff. What's useful. Here is the science, and that's the information we're transferring around the world. All of these things are communities.

(00:39:48):

Now, the future I believe is communities where humans come together in groups and we start to cooperate. And the community itself takes on a life of its own. So this is the mentality I believe that we will evolve over time. Because we have to, it's what will work. While the super organism is actually going through its death throws, if you will, as growth-based economics phases out, what will work is something else. And what works is what survives. So then we have different communities and you have the idea of the four different paradigms. And so which community will have a bit of a flavor to it?

(00:40:27):

And so at the government's level, the local community... Let's start with federal first. The federal government doesn't actually own anything. They own the military and they run the finance side of

things. They start wars and all that. So they do things at that level. The state governments don't own any infrastructure themselves. In Australia for example, the state government might own the highways. But they don't own things like waste transfer systems. They don't own hospitals. They don't own schools. And that's all local council. So the local city council level is actually the people who own the assets that will hold society together. So it's the local city or shire council who will actually do the useful work.

(00:41:16):

The state governments, what do they actually contribute? And so they're going to go through a stress themselves that they become less relevant. And at the moment they can dictate changes in budget and enforce it, but not have to pay for it themselves. So there's going to be a change in mood. And the federal government, they're going to have to really change if they're going to survive.

Nate Hagens (00:41:37):

It sounds like you're talking about a Balkanization of the world with national entities becoming smaller ones.

Simon Michaux (00:41:47):

I don't know how this will look like. What I do think is it will come to cultural identity. What is the cultural identity? And that's what we will all gravitate to, and we'll gravitate. And then when it comes to who's doing useful stuff, one part of the world might produce a lot of nice food, and everyone else around them appreciates them. So that will become an identity.

Nate Hagens (00:42:13):

We'll need oil and-

Simon Michaux (00:42:16):

Yes we will. So how do we get that oil and how do we convince people to give us the products associated with that? And so we need new systems that will evolve past the problems of the old systems. And so every single one of those systems will have to do what we do now in some form, but have the ability to evolve with change, which the current system cannot. And that's why we need a new system.

Nate Hagens (00:42:41):

Okay. So what you're trying to do is like in the movie Contact with Jodie Foster, where they built the contraption to go to outer space, and then it was sabotaged by some religious fanatics. Unbeknownst to everyone else, they had something also in Hokkaido, Japan, another version that no one knew about. You're trying to build this parallel system, do the research and the thinking and the Overton window of this new system simultaneous as the super-organism tries to continue business as usual. Okay-

Simon Michaux (00:43:18):

That's how I write reports. That's why they're so long.

Nate Hagens (00:43:21):

Yeah, I don't know how you do it, man. You just riff off these 800-page documents. I have no idea how you do it. Okay, so we have time to do a five to 10 minute overview of your different categories. Would that make sense?

Simon Michaux (00:43:38):

Okay. Yep. Yes it does.

Nate Hagens (00:43:40):

Okay, so first you mentioned energy. So how would the energy systems be different in the new system under your Maslow hierarchy framing?

Simon Michaux (00:43:51):

I've been giving some thought about what energy actually is and how does it serve us. At the moment, energy is used for transport a lot. So our energy systems will have to empower transport somehow differently. And so this is the whole electric vehicles and buses. So I think the electric system will happen, but at least substantially smaller. Excuse me.

(00:44:18):

So for example, we would see more buses, more communal transport, and less individual cars. We might have the idea of car sharing where instead of owning a car, we might book a car in. This is the idea of the self-driving car. That might happen in a small scale. It won't be enough to replace our existing systems. So the form of energy comes when it comes. It will be different to what we have now. And everything around it, including our technology, will have to evolve. And part of that I can see for example, instead of one big giant seamless power grid that delivers sinusoidally pure power all the time, and our electronics cannot cope with anything else, I can see a situation where we will evolve an engineering electronics that can cope with variable power. So if a power grid goes up or down, if we get power blackouts, it doesn't cook the electronics. So instead of seamless, we now have a non-linear production of power and its outcomes. So that means-

Nate Hagens (00:45:18):

There would be no demand for such a product now.

Simon Michaux (00:45:20):

No, no. Because no one thinks it's necessary. So if instead of one big grid, we had lots of micro grids that are connected together. And they sometimes transfer power between them. And sometimes when things get difficult, they could shut down one or all of them without actually damaging themselves and they could start up at any time. And each of those micro power grids will be around an industrial activity of value. For example, a power grid will be around a hospital. And that hospital will then also be surrounded by a community of people who operate that hospital. And the food systems for that

hospital, but all comes off that one power grid. It's reason to be is that hospital. And we might attach schools to it, that sort of thing. And so our energy will be organized very differently.

(00:46:05):

And so it may well be things like solar panels, wind turbines. But we should also consider unconventional stuff, like some of the really weird ones, like the kinetic kites are an unusual energy system. I don't know if they're viable in the current environment. But if things get more difficult, we might try such things. All unconventional and unorthodox ideas must be looked at and taken seriously, and the alternative is we go without. That's how I sort of see energy going.

Nate Hagens (00:46:33):

And then food.

Simon Michaux (00:46:35):

Okay. So food at the moment, five, 600 years ago, everyone grew their own food and they grew it locally. And then we invented industrial agriculture, which is supported by petrochemicals. At the moment, our food is created in vast quantities causing enormous problems very far away. I can see a problem with petrochemicals because it's causing land degradation and it's overloading the nitrogen and phosphorous cycles on a global scale. So the food system's going to have to be radically engineered, and it will have to become more local, and almost certainly have to become organic in some form. And so what that means is-

Nate Hagens (00:47:11):

Why?

Simon Michaux (00:47:13):

Okay, so at the moment we're using petrochemicals. And those petrochemicals, for every bushel of wheat that we send to the market, 0.8 cubic meters of soil is being sterilized. And you could argue it's improper use of those petrochemicals is making that happen. But the reality is because there's a money profit to it, that's exactly what people are doing. And so it's not just the fact that it's made on things like phosphate rock and gas, which are non-renewable resources, but how we're actually applying it is interacting with the environment in a destructive fashion. And it's not just destructive in one sector. Multiple sectors across the environment are getting hammered by this. And we are required to withdraw from those sectors, let those sectors heal naturally, and help that along, but then re-engineer our food systems.

(00:48:03):

Now at the moment, the old school plans for this is GMO technology connected to more petrochemicals managed by AI systems, and most of the farming will be done by robots. That's the vision for the future by groups like say BASF. I think that will be work in a short term, but it'll be disastrous in the long term. We actually create a worse problem.

Nate Hagens (00:48:28):

BASF doesn't make our food, they make the food-

Simon Michaux (00:48:32):

Chemical. They make the chemicals for the fertilizers and the petrochemicals, but this is their vision of the future. I attended one of their meetings.

Nate Hagens (00:48:42):

So the future of food then, a conclusion echoed by many other of my podcast guests is we're going to have to have more human labor inputs relative to today.

Simon Michaux (00:48:55):

So every more people will have to be involved in the actual production of food. One thing we have lots of is humans. Now humans are an amazingly adaptive unit that can do work, and we have energy. And so more people will be involved in more things. We have to work harder for a smaller outcome. At all levels, we're going to have less actions taken of higher quality. So we're going to go from quantity plus dopamine hit is going to transfer to quality plus much less of.

Nate Hagens (00:49:32):

Love that.

Simon Michaux (00:49:33):

All sectors is going to get hit with that. And so in food, what it means is local communities will start to grow their own food. So all the food you eat will be grown completely in say a 50 kilometer radius radius or 100 kilometer radius.

Nate Hagens (00:49:50):

There will be some places where there's a lot of people that can't be done.

Simon Michaux (00:49:54):

Then we're talking about the reordering of the human society. Dense populations, if we can't get food services to them, it becomes easier to break those large cities up into smaller communities that are more decentralized.

Nate Hagens (00:50:09):

Right. So this whole conversation is there's a dream, and a vision, and a carrot that is quite compelling based on your work. And what does that look like? That's one question. And then how do we get from here to there is a second and very important question.

Simon Michaux (00:50:28):

It's a series of steps. And the people who do it are going to have to be more competent and stronger than the generation that fought World War II. Now, that's not us yet, but we will rise to the occasion. We have no choice and we will do it.

(00:50:44):

So food will be re-engineered where a lot of our fertilizers and will be developed organically or partially organically, locally. Now we could use industry to do that, but it'll be done locally. And so what we call food will have to actually more mirror and work with the environment, not against it. Current industrial agriculture works against the environment. Our new systems will have to use biomimicry in a greater scale, and work with the local environment. And so will we.

Nate Hagens (00:51:15):

The reason I wanted to get to solutions or responses is so that a lot of people are kind of tired of hearing about the problem, and they believe it. They believe The Great Simplification is coming and they want to direct their own professional and personal efforts towards something that makes sense. And I just wanted to have an overview of these categories to get people thinking and doing in this level.

(00:51:44):

And the challenge of course is the cornucopias and the Vikings are distracting us from what really needs to be done. And so this whole conversation, we're thinking two or three steps ahead from something that our culture is not giving us the status, reward, and emotional signals of yet. What's next?

Simon Michaux (00:52:13):

Water is one of those things that people don't really sort of think is a problems. But access to clean drinking water is already a problem for many, many parts of the world, especially in the more arid areas. So it's not just water. We need water that's not polluted. And so that there are drinking water standards that need to be adhered to.

(00:52:33):

So traditionally we just get that out of a stream or a pond. But now we've got so much population in areas which the climate doesn't lend itself to supplying such a lot of water for so many people. So we need to seriously think about how do we actually provide clean drinking water. And if we don't, and this is the problem with the next one, which is sanitation. If we don't have proper drinking water, we start having disease rippling through our society, which will cripple us, our ability to do certain things.

(00:53:03):

And so we have to have the ability to filter water. And so we might move into a society where water will have to be filtered through, you can make a filter with things like charcoal and rock and gravel. And water might have to go through that to remove its bacteria load. See at the moment, our water is purified in water purification plants, but they're done centrally and their water's pushed out along all these pipes all over the city. So what if that is no longer practical?

(00:53:32):

For example, we can't maintain such a large network of pipes anymore easily. So we might have to go to a more localized way of managing water. And so you might have a water sanitation place. A water potable water supply that is say for three or four suburbs in a city together, and there'll be a standalone system. So if that system needs maintenance and goes down for a bit, the systems around it keep going. Whereas at the moment, if you have one problem in a water plant, the whole city goes down.

Nate Hagens (00:54:05):

So this also has massive geographical implications. The answer in Finland is going to be different than New Mexico.

Simon Michaux (00:54:15):

Yes. Because in Finland, it's below zero a lot of the time during winter. It can get down to minus 25 in Helsinki. So water in the ground will freeze, and pipes that freeze break. And so you can't get sewage coming out of each house and water going in if it's below zero. So those water pipes have to be attached to the heating pipes that heat the buildings, and all has to be optimized together. Mexico's a much simpler situation. But they have other problems. They have other issues to do.

Nate Hagens (00:54:45):

Okay. In the Maslow hierarchy of biophysical needs in Dr. Michaux's mind, we have energy, food, water, and what's next?

Simon Michaux (00:54:59):

Sewage sanitation. Now again, this is not a very fashionable thing to talk about. But in the past, especially when a hurricane hits and devastates a town, if you don't get the ability for people to go to the toilet and wash their hands and sanitation disease starts rippling through the area and cripples everything. And it can corrupt food, it can corrupt water. And so it's a system that allows humans to live in dense population areas together safely and healthily.

(00:55:31):

Now at the moment we have these systems which are citywide, and they use electrical power to push things along. And the problem here is maintenance. This is talking to the complexity issue. How can we maintain such a complex system in a low energy world where we won't have the ease to go out and maintain such things easily? So we have whole sections of the network breaking down, and they'll be really hard to keep going. So we're going to go from a big system, to a series of localized systems that can connect to each other if they chose, or disconnect if they need to, while one system goes down for maintenance.

(00:56:12):

And again, we're going to have to use technology that may not necessarily use power. What if we used gravity again to try and push all these systems through? And instead of actually using chemicals to treat the water plant, what if we had these big ponds that used different plants and animals to process

human sewage and the bacteria out? In permaculture, there's a lot of discussion about gray water systems and black water systems. Start thinking in those terms, but on a larger scale.

Nate Hagens (00:56:45):

And then the manufacturing, you have three categories and subcategories. Yes?

Simon Michaux (00:56:50):

Okay, so the first category is heating. Now in the northern hemisphere, we've got to heat our buildings, for our survival. Especially in the northern parts of the world, our buildings are insulated really well, like triple glazing. I can sit there in my underwear drinking coffee. Out the window, I'm looking out the window and it could be minus 30 degrees and I'm perfectly comfortable and, it's a steady 23 degrees no matter what. So that's a combination of heat, but also insulation.

(00:57:22):

Now at the moment, large portions of the world use gas for heating. We should start evolving off that. One of the things we're looking at in Finland is geothermal. So geothermal is we drill holes about 300 meters into the crust, and we use fifth generation heat pumps to get the heat up. The fluid's about 50, 60 degrees Celsius. Not high enough to generate electricity, but certainly high enough to bring heat up to heat buildings.

(00:57:52):

And so the proposal is having a 20 by 20 meter grid across Helsinki, and those holes will heat buildings. Now that heat source will drain over a period of time over 50 years, and then we'll have to recharge. If we push those holes down to 600 meters, we get enough power not to drain. So it becomes long-term sustainable. But the infrastructure needed to do that, we're talking 520,000 bore holes just in the Helsinki area. And if we drilled one a day, it would take 14 years to do all that. So the infrastructure's quite large. But if we did it, it meant we could heat our buildings.

Nate Hagens (00:58:32):

But that could be done in Helsinki. There's a lot of places in the world that that couldn't be done.

Simon Michaux (00:58:39):

So the way they do it in Scotland is everyone just freezes. It's cold. So-

Nate Hagens (00:58:46):

Well all kidding aside, we heat with propane, which comes from oil. And wood, which comes from the 2.8% of dead dying biomass from our forest. But I have a very high quality sleeping bag that if it's really cold, you just get in the sleeping bag. Isn't that part of the solution as well is to-

Simon Michaux (00:59:20):

Yes, it is. Yes, absolutely. Because in Finland, we are so used to everything so good that it's a steady 23 degrees no matter what happens outside, that we've gotten very complacent. I assume most of my time

dressed as I am now just walking around the house, and barefoot, and I'm perfectly comfortable. So we would have to actually start wearing more clothes indoors and have more clothes, bedding, and what have you.

(00:59:45):

So that brings us to a lot of heat in Finland is generated through biomass. We have combined heat and power plants, because we've got such a large environment we can do that. But the problem is the environment is seen as a solution in multiple sectors. We want to harvest for biofuel, we want to harvest for heat, we want to harvest for power.

Nate Hagens (01:00:09):

Which is why everyone to get the same table because if that thing can only be used for one output.

Simon Michaux (01:00:15):

Exactly. There's a massive paper industry in Finland. Then you ask the question, "Well do we need such a large paper industry in such a world?" And there's a few screams of pain around that when you start saying, "Well maybe we should shrink that then." But things like the plastics industry can be replaced with bioplastics in some respects. But if we're already harvesting too much out of the environment, what is truly sustainable? So we need to put everything on the table at the same time and discuss what is sensible. And that talks to the heating side of things as well. So yeah.

Nate Hagens (01:00:55):

Okay. And then the other categories?

Simon Michaux (01:00:59):

So there's two left. One is minerals, and the final one is manufacture. So minerals is something that society at the moment is absolutely dependent upon, but most of the people around us are completely oblivious. They just don't seem to understand

Nate Hagens (01:01:17):

Less so than six months ago. I think the global spike in lithium and some of these things, and the supply chain snafus are making some people aware of this.

Simon Michaux (01:01:29):

Yes, actually very much so. Minerals are a thing at the moment where they're sort of seen as a side issue. And in fact in Europe in particular, we don't like the idea of mining at all. It's seen as dirty. And what's interesting is if the environmental movement not make friends with the mining industry, then its green transition will not happen. Right? That's the brutal truth. So I can see a situation where the environmental movement and the mining industry will join hands, and both groups will evolve their practice to meet the other side halfway. And for example, every mine site will be rehabilitated when it's

finished to the point where it can now be a natural biodiversity hub. All toxins are removed completely from the environment. That is possible.

Nate Hagens (01:02:16):

So this is your core area of expertise. And many of the net zero and renewable low carbon scenarios need vastly more amounts of copper, cobalt, nickel, and such. And one of your core points that I think you mentioned on our first conversation was that there's a presumption that we will recycle a lot more. And recycling isn't profitable per se, so it would have to be managed by the government or some way to make it socially acceptable.

(01:02:58):

But even if that were the case, we still haven't built out the first generation of that size and scale of those minerals to recycle. And then the whole closed loop logic where we can recycle everything out of like a phone. I mean so many of these things are going to be so diffused that the energy required to effectively recycle them would be gargantuan.

Simon Michaux (01:03:26):

Yes. And this is part of the problem that we're having at the moment, where one part of society is not connected to other parts of society, and they just don't actually know what they're missing.

(01:03:35):

So first of all, most of the non fossil fuel system has not been constructed yet. Less than 1% of vehicles are EV now, for example. As as it has to be constructed, we can't recycle it. So the first generation at least must come from mining. But if it was all manufactured tomorrow or next year say, it's not for about 10 years that we've actually, when they all wear out the first generation of materials to come in, that's enough for recycling. And so recycling, if it is going to work... And I believe it will, but that's many years into the future.

(01:04:11):

So then you've got the problem of the metals that we want to use are things like lithium and cobalt, which we have mined in very small quantities up until now, because they're trace elements. We don't really need them in large quantities, but now we want to mine them in quantities like we do magnesium, or manganese, or even copper. And so the existing system has to expand many times to get there. And our existing production capabilities is simply just not up to scratch. But neither are our reserves.

(01:04:45):

One of the things that concern me is copper. So we need about 4.3 billion tons of copper for the first generation of electrical, non-renewable technology systems. Including everything's stitched together. So 4.3 billion tons.

Nate Hagens (01:05:00):

And if we relax your assumption of four weeks of buffer and that we have some hybrid system of depleting fossil fuels with some renewables, that 4.3 billion tons could be relaxed to 3.3 or 2.2 billion tons?

Simon Michaux (01:05:17):

I think it's 2.2 billion tons. It substantially does reduce. However, we are producing for copper say 24 million tons a year now. So we've got to run at 180 years to hit that point. So existing at-

Nate Hagens (01:05:33):

It's not going to happen. It's not going to happen. And here's the other thing, and I'm sorry to interrupt. But Olivia Lazard is going to be on this show in a few weeks and her work is the countries where this stuff comes from. And not only are they war-torn and have inequality issues, but there are also many of the countries that are going to be influenced dramatically in the near term from higher wet bulb risk to humans climate impacts. And we won't even be able to extract in these countries because of social and environmental reasons. I can send you some info on that.

Simon Michaux (01:06:22):

Yes, please. But these are the things we need to get our arms around. So our copper reserves at the moment are at 880 million tons. Now existing growth, that's according to the USGS, US Geological Survey.

(01:06:36):

So prior to 2020, humanity mined 700 million tons of copper back to 4,000 BC. And that sounds like a lot. But to keep up with copper growth, copper demand growth, just the way we are now without electrifying, we will do the same in the next 22 years. So the last 4,000 years will be compressed into 22 years to keep up with the economic growth as it's increasing.

(01:07:03):

And so the first generation, let's say the 4.3 billion tons is correct. That is 6.2 times the historical mining rate back to 4,000 BC. So if we are right and we can shrink that buffer down, we are still three times the historical rate.

Nate Hagens (01:07:19):

Not the historical rate. The historical total cumulative-

Simon Michaux (01:07:26):

Volume. Yes, that's what I meant. Yes. So then this is the difficulty. Now what I believe will happen is instead of actually trying to do the impossible there, we will do something else. We're just going to change reaction and do something else. And what does that, something else is, is going to be based on the limitations of what we're looking at. And that is the purpose of my work. Looking at that something else and having discussion around that.

Nate Hagens (01:07:51):

So in the minerals portion of your hierarchy of biophysical needs, how do you see that?

Simon Michaux (01:08:01):

Well, we're first going to have a frank discussion of what minerals we think we need versus what we've got. And then we're going to realize what we've got won't work with the existing plan. And we'll start doing things like making batteries out of sodium, or sand, silica, or fluoride, or zinc, or lead.

Nate Hagens (01:08:19):

Lower tech, scalable things that don't give us the dopamine return on investment, but they are cheap and functional.

Simon Michaux (01:08:29):

And can be recycled. So we're going to first scale back our expectations and our requirements for complex technology. We'll develop a technology that is simpler, more robust, and can deal with poorer quality material inputs, and require less energy to produce.

Nate Hagens (01:08:46):

How much of this is happening now in this domain?

Simon Michaux (01:08:50):

So there's a lot of talk at the moment that the current mining industry is driven by demand and it's driven by money and by profit. So at the moment, there is just a bit of talk. And we're starting to talk about alternatives, like batteries made of fluoride for example. But at the moment, it's not taken seriously. And the future is seen as lithium iron based chemistry, like LFP batteries for example. And that is the focus, 100% of the time. And so they're giving it lip service now, whereas five, 10 years ago, they wouldn't concede it existed at all. So it is progress.

(01:09:26):

So first of all, we're going to change what we are going think we're going to do. Then we're going to start sourcing our minerals from our waste products because it's all around us. Can we do stuff with what we have instead of trying to mine it in the first place? It's a form of recycling.

Nate Hagens (01:09:41):

For a while. But it's like saying that using biofuel from restaurant waste is sustainable. It's only sustainable as long as we have restaurant waste.

Simon Michaux (01:09:53):

You've got it. You nailed it. So it's going to be a stepping stone, and it's a stepping stone to something else. And so we will scale back our needs, and our society will simplify, and everything. And so when we

do start mining out of the environment again, we're going to go after different minerals and for different reasons. And we will value them much, much more.

Nate Hagens (01:10:16):

That I believe. So that may be a deeper dive for another conversation. Why don't we finish with your overview. What's the remaining categories?

Simon Michaux (01:10:27):

The last one is manufacture. Current manufacturing at the moment is dependent on a very complex, six continent, just in time supply grid. And when we build something like a computer, it's tough. Pulling stuff from all over the world, and it is like the transport of material goods is irrelevant. It's based on that assumption. I think it will become more regional.

(01:10:50):

Now the current manufacturing system will start to fragment I believe, and we will see the components part of the value chain crash. Like for example, microchips to go into cars are becoming a problem. Therefore cars are not being produced as much anymore. That's the example. But we'll start seeing that in other sectors. So I can see a situation where the value chain around the components will break down, but then before that, there'll be the ability for smelters to produce metals will start to become difficult, because concentrate getting to them is no longer what they need to produce effectively.

(01:11:31):

So the part on the end, the car on the showroom floor is the very end of the value chain. And they will become less available and less accessible because the value chain before them is starting to fragment.

(01:11:46):

So when it fragments, we will develop a new technology that is more primitive, is more robust, can be subject to change, and is more adaptable. And will be sourced within say a 500 kilometer radius around from where the final product winds up.

Nate Hagens (01:12:04):

So when you say we in this case, do you mean all of humanity, or do you mean those communities and 500 kilometer regions that are thinking or working ahead? Or how did this come about?

(01:12:20):

Because my challenge with all this is it all generally makes sense. And of course I have a probabilistic view of the future. So we could kick the can another decade maybe, or this could all be upon us by next summer. I don't know. But there will be these parallel things. There's a lot of people that are chomping at the bit to work on the future that you're describing. But those people are still a tiny fraction of those riding shotgun on the super organism where we need growth, and economies and jobs are going to be the thing that dictate our elections and everything else. And energy security will trump lower carbon, etc. And so we will be pedal to the metal until we hit a wall. What you're talking about is once we hit a wall, these are the things that need to be in motion. So expand on your thought

Simon Michaux (01:13:19):

So conversations already happening around this, certainly around me. Now what I mean is I put forward the idea that what might work in the future is alliance between industrial clusters. Not between political nations, industrial clusters.

(01:13:33):

And you might have a cluster around for example, in Iceland, they've got a lot of geothermal. So much that they can make aluminum, which is almost pure electricity, right? So geothermal makes heavy industries, things like aluminum. They could also make lots of ammonia or hydrogen using the heat. So that's a hub.

Nate Hagens (01:13:53):

Yeah, Iceland is going to be a very wealthy nation in the future, I expect.

Simon Michaux (01:13:58):

So then you've got groups like Norway that have oil and gas. Even though it's declining, it's some oil and gas. So they could keep the local region going while we're actually constructing this system. But they've also got a lot of hydro, right? Hydro power, a lot. So all right, so we could actually attach industries, sectors to that.

(01:14:19):

Sweden and Finland has a combination of nuclear but also combined heat and power from biomass, which also is linked to industry. So how do we organize around that? So we are seeing an ordering across for example, several local nation states at the moment. So the size of the circular economy could span say Finland, Sweden, Norway, Denmark, Iceland. And you'll have a circular economy-like structure going between them. But it's actually the energy sources that will organize the industry, and the industry will organize everything else.

Nate Hagens (01:14:59):

And so what I can envision is that those countries you just mentioned start on this now as your work is doing Simon. And that itself acts as an Overton window for the rest of the world. And the rest of the world will have to do it differently because of social, geographical resource peculiarities of their situation. But at least someone is doing it and bringing up the questions, and then they meet a roadblock, and then they think of a different question.

(01:15:30):

And so as long as it's happening, I think it's helpful. Because ultimately, I think you and I had a phone call the other night, we're talking about nothing short of the social evolution of the aggressive primate that came across a giant amount of fossil pixie dust that we're extracting 10 million times faster than it was sequestered, treating it as if it were interest rather than principal. And now the party, it's almost morning and we need to sober up and come up with a plan. The plan is going to be feeling like

withdrawal to a lot of people, but we still need designated drivers, not to mix too many metaphors in this summary, to kind of point away forward. Even though we don't see the destination, this is a way.

Simon Michaux (01:16:28):

So I'm actually talking to a group in Hawaii where they want to do the same thing that I did in Finland, as in what were six scenarios to phase it fossil fuels in Finland. Do the same thing in Hawaii. And that's actually now in progress. And the purpose of that work is to be a book in for Iceland, because when we approach Iceland. How do we do that for Iceland? And so they become two sides to the planet, but you've got an isolated island, they both have geothermal. How would they approach that, and what are their respective problems?

(01:16:57):

So this is the purpose of the global community. We could transfer information from one end of the world to the other. How did we do this? What were the problems? What were the things that worked? How do we navigate our way out of this? What are the lon-term problems? That's the transfer that's actually happening.

(01:17:18):

So I believe we are looking at the evolution of the human species, like you just said. But if the human species was modeled as a single individual, it'd be like an obese crack addict that's been told to kick the habit and lose some weight. And it's going to be painful, but this is what we have to do for our survival. And on the other side of that, we're going to be much healthier.

(01:17:56):

This happening at humanity at all scales. So in all sectors. And so we need to develop our own understanding of that. And so we need large groups of people to see this together, not just a few individual shouting from the rooftop.

Nate Hagens (01:18:10):

So to the people listening or watching this, what kind of closing thoughts do you have to summarize what we just talked about and to leave them to think about or apply to their own lives?

Simon Michaux (01:18:24):

So I would say to them that they're in better shape than anyone before, even as scary as it is and the unknown we're walking into. And there is no one plan. So like diversity of species in a jungle environment is a strength for the long-term survival of that jungle, diversity of ideas have the same strengths. So we need them all for our long-term survival. We can't face one consensus, it's just like a broad brush direction. So we've got to put these ideas out there and discuss amongst ourselves. And understand that this is very, very challenging, and none of us actually know what we need to do. Even though our skills are not necessarily what we need. We're almost like a blank canvas in terms of skills. But in terms of our self knowledge and our ability to think, our opinions mean something. We believe in human rights. We have education. Men and women are educated now. So we are in better shape now than we've ever been. Instead of banging on about the problems and our past failings, we should

probably try to face the future with open hearts, and actually think positive with the understanding that this is going to be rough.

Nate Hagens (01:19:55):

That's where I'm at emotionally and philosophically. This has been great, Simon. I know there's a lot of thoughts and work underneath this umbrella overview you've shared. Not to put you on the spot, but I would like to have you back in a couple months, and probably repeatedly. What would you like to take a deep dive on? Something that's prominent in your heart and mind on this stuff for our next conversation. Not held, but off the top of your head.

Simon Michaux (01:20:33):

One of the things that actually is something that needs unpacking and hasn't been done yet is the role of coal. When we manufacture a solar panel, to get a solar cell, you've got to heat that silicon up to 2,200 degrees Celsius. At the moment we use coke and coal. Now if we take away coke and coal, how do we do that? And there are options, but they're things like using biofuel, or hydrogen, or electric arc. And so scaling that problem up basically means it's not going to work. So when we lose coal, we lose manufacture. So what we could talk about next for example, is the true role of what the three fossil fuels actually do for us. Oil, gas, and coal.

Nate Hagens (01:21:20):

Yeah, I think that's a good conversation. I just last week talked to Art Berman about what the products are in a barrel of oil. And the light things that our chemical inputs like butane and ethylene come off first, then gasoline, then diesel, then the asphalt and things. So if for some reason we don't need gasoline anymore, we still have to burn off the gasoline to get to the heavy things that we absolutely do need, like the 10 trillion worth of diesel machinery in the world. So oil is going to be with us. Probably in smaller amounts, well definitely in smaller amounts. But we can't live without it at the present. So to have that broader conversation with you on the three main fossil fuels, that would be a good conversation.

Simon Michaux (01:22:13):

What do they really do for us?

Nate Hagens (01:22:15):

Yeah, what do they really do for us? What do we really need? And what do we not need? Yeah. Excellent. Happy Halloween Superman. Thank you so much for your continued wisdom and hard work on these issues.

Simon Michaux (01:22:32):

Incidentally, your actions when you came over on August 8th were amazing, and they have legs. And we might have to do that again.

Nate Hagens (01:22:41):

Okay. I'll get you the video later this week, and we'll share those online. And I'm happy to help. Not only because you're my colleague and friend, but I do think Scandinavia has the structure that they could start doing hard work on these questions that the rest of the world could pay attention to. So I'm happy to help in any way.

Simon Michaux (01:23:02):

Okay.

Nate Hagens (01:23:04):

All right my friend. Thanks so much.

Simon Michaux (01:23:06):

You're welcome, mate.

Nate Hagens (01:23:08):

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