Nate Hagens (00:00:02):

You are 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 in 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):

Today I'm happy to welcome back to the podcast Simon Michaux. Simon works for the government of Finland, has been on this podcast a couple of times, is a good friend of mine and a good human being. Simon returns to unpack the road to Arcadia, which was one of the four types of people working on a pro-social future. What sort of technology, what sort of frameworks to get us from here to there. We center the conversation around a recent paper by Simon called A Resource Balanced Economy, which is in contrast to the popular circular economy.

(00:01:14):

We talk about supply chains, new technology, data collection, artificial intelligence, and what it's really going to take to get from here to there. For those of you that have followed Simon and my conversations or elsewhere, you know he is a colorful personality. He has a passion for exploring ideas. He's become a good friend of mine who I trust and I love to just watch his brain work in real time. This was a fun conversation. I hope you enjoy Simon Michaux.

(00:02:00):

Good day, mate.

Simon Michaux (00:02:01):

Good day, mate. Hyvää huomenta and good day mate.

Nate Hagens (00:02:01):

Hyvää huomenta. The only two Finnish words I know.

Simon Michaux (00:02:11):

Well, I know three. The third one's noni.

Nate Hagens (00:02:12):

Noni?

Simon Michaux (00:02:16):

Noni. It's a general purpose sentence filler. You can apply it to many different applications.

Nate Hagens (00:02:22):

You are wearing a skull and crossbones shirt instead of a Superman shirt today. I hope that is not a ominous for voting for our podcast topic.

Simon Michaux (00:02:31):

Change of warning. What's happening is I'm reading this book that Amanda Scott sent me and I'm finding it to be very, very, very entertaining.

Nate Hagens (00:02:39):

Okay.

Simon Michaux (00:02:39):

Thanks Amanda. Hello.

Nate Hagens (00:02:48):

In contrast to our usual podcast, my diurnal cycle has changed. Last year I would have coffee in the morning and then I would wind down in the evening with a glass or two of wine. My new schedule is I have a podcast in the morning and then I have a podcast in the evening. I'm on a completely different schedule. This is very early in the morning here to get you to talk with me on Finland time. Thank you again for being here. Since I stayed with you last summer, I've come to realize, I don't use the word lightly, but you are a polymath.

(00:03:30):

You're kind of a goofy guy, but you're so smart and you have so many aspects of this in your brain. What really impressed me, and maybe we'll have time to show a little excerpt of this, is all your little notebooks on the wall. That when you are waking up in the morning or you're waiting in an airport, you draw these sketches of future things

that are in your mind. And boy, you just have a wide breadth of that stuff, Simon. It's impressive.

Simon Michaux (00:04:01):

Yeah. What's happening there is, when I was doing my PhD, I was trying to connect to my subconscious mind, to my conscious mind to do some problem solving. When you walk down the street and a car drives past you and later that night you have a dream and that car's in your dream, that car will have the same number plate in your dream. Your mind is a supercomputer and it collects an enormous amount of information. For years I've been trying to train myself as I go to sleep, I'll make a point of thinking about something.

(00:04:34):

You wake up in the middle of the night and you often when you have fragments of a dream, or when you wake up first thing in the morning, first thing you do, write it down. Because these things evaporate very quickly. They're usually some kind of weird abstract drawing that you think will explain to yourself later. What ends up happening is all my really interesting ideas happen when I'm asleep.

Nate Hagens (00:04:57):

Dude, it's the same with me. I tell my students to not have their phone next to them when they go to sleep for addiction and dopamine reasons and I used to do that. But now sometimes when I wake up I have something called cocoon on my phone and I leave myself. I'm like, oh, of course I'm going to remember this good idea in the morning. But then I never do. Now I just record in the middle of the night when my eyes are still closed.

(00:05:23):

It's called a hypnogogic state, which is this time between sleep and wake. I'm the same way. I get my best ideas for Frankly's or papers or videos when I'm either exercising or half asleep. With that preamble, this is your third appearance on this podcast. In the first one, we discussed why energy would be a limit to a business as usual future. That minerals and materials would be a limit to the proposed green renewable future that many people are advocating.

(00:06:05):

In the second episode, you outlined four social groups that are present when talking about and thinking about our future and global predicament, the old school. Which is just people that want to see a continuation of the existing system, which is the majority of people. The Vikings, who are those people who would take advantage of a failing system. The realist who are those people who are getting practical, kind of the prepper community, personal short-term survival needs, but not focused on the larger societal health.

(00:06:40):

Then the focus was the fourth category, the Arcadians. Who had the longest time goals and want to build a new society based on creating better relationships with communities, the environment and ourselves to create personal responsibility. You also outlined seven categories for interventions when thinking about the needs of such a future society. Transport, water, food, sewage and sanitation, heating, minerals and manufacturer. The uniting theme of all those seemed that they would need to be more localized than we currently have, and perhaps designed uniquely to each region or community. We won't spend more time on that summary than that. I recommend people go back and watch those episodes. But do you have anything to add to that or highlight before we dive in to this episode?

Simon Michaux (00:07:40):

Yeah, the first thing would be the energy source. Where does that energy come from and in what form? That's the first thing to look at. The other thing I would add is things are moving really fast. We've now got multiple black swans around us. Some are visible. But some are not here yet, but highly probable. It's no longer a drill. It's not a theory that can be ignored. Our daily lives are being impacted. When we talk about the four groups of how we're going to respond, those groups are forming now. Because the wheels are falling off now.

Nate Hagens (00:08:18):

No, I see that and I feel that and I hear that from people reaching out, et cetera. Okay, let's first touch on this idea that many viewers of this podcast are probably familiar with complex adaptive systems. What is this and why is it important to understand as we move into thinking about the breakdown of the current arrangements of a global system?

Simon Michaux (00:08:47):

This is just a mathematics that's jargon heavy. Now, we have to be careful not to get tied up on things that don't necessarily mean. We get tied up in the methodology and the methodology becomes the reality. Complex adaptive system is simply a way to actually get our arms around the idea that we've got a very complex system. That everything is connected to everything else. A relatively small change can have big impacts in a ripple context. It's a concept to help understand how our society is made up into many parts and it's constantly changing. Our world is complex, so how do we understand what changes and why? I'm using this idea in conjunction with other things. We need many, many tools to connect together and this is just one of them.

Nate Hagens (00:09:42):

You have a new paper out or proposal out called A Resource Based Economy, which we're going to discuss today. Do you want to give any background or backdrop to that first?

Simon Michaux (00:09:58):

It's actually, I call it the Resource Balanced Economy. It's an evolution of the original Venus Project idea that the zeitgeist movement made very famous back in 2008. What I've done is, I've put a series of energy terms into the basic architecture energies at the very center of everything. Where this came from, the work that I've been describing in the last two of our podcasts has been presented now a few times to people across the world.

(00:10:26):

They all said essentially the same things. First, they were very shocked. They were shocked by what I present to them. But they couldn't refuse it. That the logic behind each including the size of the buffer for power generation, they couldn't refute it there and then. Every single group asked me to come up with a counter plan, fix it. What do we do? Now in Europe, what we talk about extensively is what we call the circular economy.

(00:10:58):

It's like an alternative to steady state economy. Same basic principle. But the circular economy in its current form is thermodynamically imbalanced. It's not going to work. That was one of the things I used to talk about. Anyway, they've actually asked me to

evolve the circular economy in context of my work. The paper that's come out and there is now a link for it. We can put the link in the comments below, I suppose. Is a 50-page document, which is a description of how society might do its best to meet these challenges. Where we've got to change our relationship with energy, with the environment, with technology, with energy and each other.

Nate Hagens (00:11:46):

Do any of the fix it paths that you've described result in more energy and material consumption per capita?

Simon Michaux (00:11:58):

No, it's all less. Everything shrinks. Everything shrinks. There's going to be an across the board less quantity of all things. But the things that we do do will have to be much higher quality. Less quantity, more quality.

Nate Hagens (00:12:14):

How do you find the politicians and think tanks and institutional response to that type of statement?

Simon Michaux (00:12:23):

In person they said, this is a very interesting holistic approach. Publicly, they haven't said anything at all, like it doesn't exist. They've got the same problems as before. They're attached to the same paradigms. I understand that. But they're reading it and they're passing it around, which is a better result than what it could have been.

Nate Hagens (00:12:49):

Let's dive in a little bit deeper to the resource balanced economy. Can you explain what that looks like and how it's different from the currently touted circular economy?

Simon Michaux (00:13:03):

The circular economy is the basic idea that we don't dig up materials from the ground, called mining and process them and throw them away and turn them into landfill. The circular economy is the idea that we get all our resource needs from recycling rubbish. That's thermodynamically imbalanced and it doesn't consider energy terms or thermal

entropy terms. Instead of trying to actually fix the circular economy, I completely came up with a completely different idea.

(00:13:38):

This entirely new concept, it's going to be based on four basic challenges. The energy systems required to be developed will be fundamentally different. See the form the energy takes, whether it's oil, gas or coal at the moment, has dictated what industry and what activities has actually evolved around that and what form it takes will. If we go to a new energy system, that will change. As a direct consequence, the nature of industrial activity will also change and it'll involve to something completely not seen before.

(00:14:13):

That's the first challenge. The second challenge is a, hang on, let me just turn that off. I'm getting a flashing light. Sorry about that. The second challenge is a new relationship with the environment reflecting ecological reality. People like Bill Reese can actually talk at length about that sort of thing. The third challenge is how raw materials are sourced. It has to be very different to what it is now. Whatever it becomes, it will have to reflect the quality of what resources are available.

(00:14:42):

The technological capability to extract those resources and the quantities we're going to extract them in terms of physical reality, limited by physical reality. We have to be central. The fourth challenge is the restructuring of society into an entirely new social contract and how we perceive the environment and energy and resources in each other. We'll have to go to something else. That sounds complicated, but it's actually one relationship, not many.

(00:15:10):

We just have to develop how to do it. We're going to have to meet some challenges. These are the boundary conditions. The first boundary conditions is possible peak crude oil production. Now that's being supplanted by the gas industry as Art Berman has shown. But when we do hit peak oil production, it will have implications across our society. We're probably looking at peak energy consumption per capita. We've got to decide the human society's part of the environment as opposed to separate to it.

(00:15:42):

Our long-term survival is linked to the long-term stability of the biodiversity of life systems. That's not rocket science, but here we are. The planetary environment is in a state of deterioration and industrial pollution in several forms is overloading the planet. There's two sectors where things have gone wrong. One is our industrialization, the other is food production. Whatever we do next has to fix those two sectors in some form. We're looking at the end of growth based economics. That now has to phase out. Something has to take its place. We're probably looking at the collapse of the ICE transport network. Now that's not-

Nate Hagens (00:16:22):

I-C-E?

Simon Michaux (00:16:23):

Yeah. Internal combustion engine. Now at the moment, a lot of our transport systems, whether they be planes, trains, trucks, automobiles, aircraft, it's all petroleum based somehow. I can see a situation where we are going to, it's not a question of running out of resources, it's a question of not being available in the market. Things will just stop appearing in the market. It'll be non-linear. We can probably power things with non fossils fuel systems that are in place already.

(00:16:59):

There's quite a lot of systems in place. But the transport network is going to suffer. The next thing is manufactured goods, there's going to be shortages of all kinds. Metal shortages are really mineral shortages. When we're talking about shortages of available metal for manufacturer, it's actually a mining problem. There's going to be a shortfall of regional industrial capability. These are the sorts of challenges that we have to face. We're also probably looking at things like, we've got to phase out petrochemical fertilizers. How are we going to do that? Plastics are going to have to be phased out. But there are solutions too. For example, anything that can be made out of plastic can also be made out of hemp. Can we explore that? How do we do that? And so on.

Nate Hagens (00:17:54):

Probably not anything, but a lot of things.

Simon Michaux (00:17:56):

Most things. Most things.

Nate Hagens (00:18:02):

I want to focus on your resource balanced economy paper which is not the political economy. But when you say peak oil will lead to peak energy will lead to peak growth, I agree with those things. I think peak oil is not about running out of oil or energy, it's an inflection point when that which powered our incredibly growing economy the last century, is no longer available at the scale and price that would require continued growth.

(00:18:40):

But one of the casualties of that may also be the current globalization and the international trust and the geopolitical situation. I just question in your resource balanced economy, how local and regional would that be? Because resources, particularly energy and minerals and materials are not evenly distributed around the earth. How much thought have you put into supply chains and regional blocks of supply chains to strengthen them, making them more resilient? I think you mentioned in your new paper about something called industrial cluster architecture. Can you explain how this conceptually would work without getting overly dragged down in the geopolitical constraints?

Simon Michaux (00:19:35):

Okay, so the way I see this happening is how we would meet a natural emergency, natural disaster emergency like a hurricane hits your town. Now everyone in that town would actually stop what they were doing normally. They'd put aside their normal business activities and they would then actually take steps to make sure that their community was actually looked after. That's the mentality behind this. As systems that we've actually depended upon in the past for one reason or another become unreliable and they shut down or they just stop completely.

(00:20:11):

Or they become inconsistent, they're available every couple of months. Alternatives will be brought to bear and every region is different. Every region has its own set of challenges and opportunities. The conversation's going to be something like, we need X. Now we used to get X from over there, we've now got to source X some other way.

Now that that's either finding a different kind of technology to substitute the technology itself.

(00:20:45):

For example, cars are replaced by bicycles. It could be finding a different way to manufacture the technology. We'll make cars ourselves out of a different kind of set of materials. Or we come to terms with the idea that we don't need the technology at all, survival, we'll just get by without it. We'll have to socially change and maneuver around these things. That's not a very pleasant conversation. But I think how we're going to go with that.

(00:21:12):

The industrial cluster idea was, this might sound a little strange. It was originally thought about is how an organic self-sufficient farm operates applied to industrialization. Now on a farm you've got horses and cattle that produce poo. The poo can be turned into compost. The compost goes onto crops. The crops grow foods. Some of the crops are fed back to the horses and the cattle. Some to the chickens. Every output goes to another input and very little is wasted if anything at all.

(00:21:52):

You have a lot of dynamically self-feeding systems on the same property. Our industrialization at the moment operates on the function that it is so easy to transport things. That we can transport a manufactured good to the other side of the planet that's not even finished yet, and then bring it back. That's quite okay because transport is so quick and easy and cheap. What if it wasn't? What if the acts of transporting physical goods all of a sudden has become more expensive?

(00:22:24):

How do we fix that? Let's say we're going to make a washing machine. We're going to have a site that makes washing machines. Instead of having factory dispersal over the world, one factory in China makes the electric motor. Another factory in China might make the shell. Another factory in South America might make the bowl, what everything sits in. It's all made separately and it's all brought together and put together. What if we had 10 or 12 different process plants that when they were normally spread far apart, put very close together and they're all optimized together to produce a finished product? Raw materials and components go in one end and a

washing machine comes out the other. It's a cluster. Six or seven or however many industrial processed plants that are optimized together. I actually saw this in action.

Nate Hagens (00:23:22):

Finish your example, and then I have a couple of questions.

Simon Michaux (00:23:25):

On our professional tour into Leipzig in Germany, I saw the BASF process plant. It's the largest chemical refinery in the world. It had 200 processed plants integrated together into one big, gigantic, enormous site where everything fed everything else. It was the most amazing thing I've ever seen.

Nate Hagens (00:23:49):

BASF doesn't make the products, they make the products better.

Simon Michaux (00:23:53):

Yeah.

Nate Hagens (00:23:54):

That was their advertisement that I recall.

Simon Michaux (00:23:57):

They're a chemical refining company and they make a whole series of products. But there was more than 200 separate process plants where outputs and inputs were optimized together. This site had over, get this, 100 train stations to move staff and products around.

Nate Hagens (00:24:20):

Then their resulting product, whatever it is, those get exported around the world?

Simon Michaux (00:24:24):

That's correct. Raw materials go in, products come out.

Nate Hagens (00:24:31):

It is quite early in the morning and I'm still having my coffee, so bear with me. When I taught my class, I did an economic game of showing comparative advantage where different countries were different experts on oranges or chocolates. The guns and banana example, that if a country is best at producing both guns and bananas, the country that's least bad at one of them should specialize in that thing and produce all bananas and trade in the international market.

(00:25:11):

When we mapped this out, the physical oranges and chocolates. By specializing, the world had more oranges and chocolates than every country doing it on their own. This is the theory of the last 30 or 40 years where we pursued these policies of import substitution where every country produced what they were specialized in. But what I did is then I changed the cost of transportation which was the chocolates, and I pulled away the chocolates because it was getting more expensive.

(00:25:51):

Then those countries that were in autarchy, which had never been trading at all and were poorer materially for a while, then had advantages because they were more resilient to the period when chocolate, in this case oil, was more expensive. My question to you is, we have based an entire global infrastructure on oil as the hemoglobin that transports goods around a global transportation structure remaining cheap and plentiful. When that starts to get more expensive, all of our focus on profits and efficiency, we have optimized deficiency at a cost of resiliency.

(00:26:42):

What you're talking about is in the future having a focus more on resiliency instead of efficiency or said differently, being efficient with a new, much higher cost of transportation. That's a little backdrop to this next question which is, it sounds like what you're proposing is very similar to what I'm working on with US government people on something called advanced policy. Which is those things that we're going to need to do in the future that are socially and politically unacceptable right now.

(00:27:19):

But we need to have blueprints and break glass plans and constituency and awareness. Because by the time society really gets the signal that the hurricane is here and we need everyone drop what they're doing and focus on this, it's going to be too late for many places to build in this stuff that's got a time lag. Are you recommending

with the resource balanced economy to have pilots and a political constituency and awareness to get this scaled ahead of time? Or what are you proposing exactly?

Simon Michaux (00:27:57):

Okay. I'm proposing a few things. First of all, I came to the conclusion it is futile to predict the future and it's futile to control the world even if you could predict the future. I'm using some ideas out of biomimicry where I'm trying to look at the natural world. How does the natural world solve problems and how do they meet a complex problem? For example, let's take a forest or a jungle. Let's say the Amazon jungle. The Amazon jungle is made up of a number of species.

(00:28:33):

Amazing array of species. But some are more dominant than the others. But there are still rare examples of unusual species. There's a genetic library. When that jungle has an environmental change, like say a drought, a big drought hits the area, the species that were dominant to the old conditions start to die off. But somewhere in the jungle, in the genetic code, there's another species that can thrive in the new conditions, they then take over.

(00:29:07):

At the end of the process, the jungle now has a different set of species that are dominant. You still have the biodiversity, but they're in different proportions. But the jungle is still intact and it's stable because the life that's in it keeps it stable. What I'm proposing to transfer that to human society and our industrialization. This is the biodiversity of ideas or the diversity of ideas, sorry. What I'm proposing is first to understand the nature of what's happening to us.

(00:29:39):

Then try and get out the idea that, where can we put our efforts where they will be rewarded? Or where something will actually progress. If we try and flog ourselves to try and keep the existing system going, it'll work for a bit, but we'll exhaust ourselves and we'll waste our time and we'll fail in many respects. Then it's to understand, what could we do that might help? Work on the things that will work. Don't worry so much about the things that won't work and understand that some of these systems are going to fragment apart. At some level, you were saying?

Nate Hagens (00:30:22):

Well this builds on something I intended on asking you. That a lot of people in social media and analysis are attempting to build out an entirely new system. But we are part of a dynamic system that has a metabolism and a momentum. Given the constantly changing biodiversity of our economic jungle as you put it, and the unpredictable nature of global climate and geopolitics and energy and human behavior, perhaps it's better to think about toolkits and systems that are highly adaptable to these constantly changing conditions. What are your thoughts on that and how would someone listening to this in a position of authority to impact these things, start to approach this?

Simon Michaux (00:31:19):

I talk to a few people now who are in positions of authority, and I find all of them have been trapped by a paradigm. They have a set of ideas, a set toolkit, and all they've got is a hammer, so every problem's got to look like a nail from their perspective. What is happening to them is their normal methods of operation, the hammer and the nail for that matter, are changing into something else they don't recognize. They all think that's a temporary thing, it'll get back to normal.

(00:31:52):

What they don't realize is this is the new normal and we're about to evolve into something else. What I'm trying to show here is develop a series of tools, a series of mechanisms that we could work with that might work in this environment. Where people in positions of responsibility, when they realize they're really rolling the rock uphill and they're just not getting anywhere. That if they were to try some different things, what would those different things be? I'm getting that out to as many people as possible. Where I've got some ideas, they're a starting point, and those ideas are to be developed by everyone else. They're a starting point, they're not the solution. When we hit a roadblock, can we get around that roadblock somehow? Can we actually realize what is our situation awareness really telling us?

Nate Hagens (00:32:51):

Well the roadblock is GDP and profits as our cultural goal and the political economy organized around that. If you propose something that's counter to that, it may make sense to the analysts and engineers that you're talking to. But there's a glass ceiling in the political implementation of it. Yes?

Simon Michaux (00:33:15):

Yes, that's correct. But I have a parallel suggestion to what they're normally doing. How do you maintain continuity of governance to make sure the needs of society are met? We're not trying to be the most economic or the most efficient or effective. We're not trying to outperform the free market. As an emergency safety net, a series of thinking and ideas like blueprints, break class blueprints, but not just for people in position and responsibility, but for society at large. At the moment, we do things this way and when things get difficult, well there are alternatives. We don't have to lose hope.

Nate Hagens (00:33:59):

This is on the fringes of the conversation of triage prioritization and rationing. But where you're coming from is, not only is the way we organize our industrial production infrastructure important, but what we are producing is just as important if not more so.

Simon Michaux (00:34:20):

Correct. Very much.

Nate Hagens (00:34:21):

Right now we produce things for user preference and user optimization, often short term, single use. Pretty much never with recyclability and integrated chains in mind. How would someone in government listening to this program begin to balance design principles with what we consume? Will it mean that some products currently on the shelves that we currently use and expect, just won't be made anymore?

Simon Michaux (00:34:54):

That is correct. The way I have been able to do this is, the students in the university that I'm working next to, I gave them a challenge. This is a mobile phone. This mobile phone, it's got lots of toys in it and lots of exotic metals in it that frankly I don't need or use. If I challenge them to make a communication network where the metrics were. I had to be able to make a phone call and send an SMS text from one end of the Finland to the other and all the infrastructure between.

(00:35:30):

But they had to build and manufacture everything locally and all resources had to be sourced within a radius of 1000 kilometers. What are the steps they would go do that? What they came up with is they'd use 3D printing to make the phone. The phone will be made out of much simpler materials and it looks like the old-fashioned Nokia. A very, very simplified version of what we have now.

Nate Hagens (00:35:57):

For example, much simpler materials like what? Can you share?

Simon Michaux (00:36:02):

At the moment, we have say these very complex alloys that take a lot of energy and thermodynamic very, very complex systems. Highly pure materials that take a lot to mine and refine. They're blended together into these exotic alloys that are really hard to recycle once they're done. They're just not needed.

Nate Hagens (00:36:27):

We've just really built, and I understand this because of the logic of the superorganism. We've just really built this giant waste producing Rube Goldberg machine as a global economy that gives us dopamine spurts every day. It is totally nonsensical from a resource energy environmental standpoint.

Simon Michaux (00:36:48):

Yes, absolutely. For example, back to the phone. We need gallium, a metal gallium. Why do we need gallium? Oh, it makes the screen on the mobile phone. That's one of the things they want to recycle. They want to rip the screen off and recycle it. Gallium. Hang on. Do you need a screen on the mobile phone? No. No, you don't. If you don't need that, do you need the gallium? Oh, right. If we were-

Nate Hagens (00:37:16):

Why don't you need a screen?

Simon Michaux (00:37:18):

You could have a liquid crystal screen like the old calculators that we used to have when we were in school. All you need to do is a text. You don't need three or four cameras and a high resolution color screen and all the things with that. We'd like to

say we do, but actually we don't. The little white lies we tell ourselves and some of them are whoppers. If we were to actually make something simpler, if you were to refine copper and maybe brass, simple alloys.

(00:38:00):

The way metallurgy was say back in the 1920s. There were some alloys, they weren't that complicated. As such, they can be extracted apart much more easily. If we were to design something that when we are finished with it, it can be broken apart and recycled into something new, it's okay. But that has no recycling solution that's easy. Most of the time it just gets thrown into the furnace and all these rare earth elements that just kissed goodbye. Why? It looks cool. The dopamine hit. Wow, look at the expression on my face. That is how our economics is driven at the moment. It's not driven by need. Our economic systems have get to the point where what we do, what we need and what we want are all the same thing. At the moment they're really not.

Nate Hagens (00:38:57):

How do those students, Professor Michaux, respond to these tasks and designing a new phone that can text within Finland?

Simon Michaux (00:39:10):

Where I do it is, you get them into a room with a big whiteboard. You say, "All right everyone turn off your phones. You're now looking at me. You're not looking at your phone." You create a situation where we have a discussion, everyone's got a whiteboard marker. You have an idea brainstorming session. You say, Here is your task." You write it up on the board. "How would you do it? What are the bits that we need?" They have a discussion back and forth.

(00:39:39):

They are doing it in terms of they've been given a job to do. It hasn't occurred to them that this is an emergency thing that they have to fix. They think it's just like an assignment or a practice and they think it's all a bit cool and everything. They tend to go for it. The people who are the most useful, who I talk to, are the postgraduate students, the masters and PhDs. Everyone else is either in the rat race and set to a paradigm to work to or they're trying to get to the rat race.

Nate Hagens (00:40:15):

In addition to energy and minerals, young people are also a critical resource for this Arcadian transition.

Simon Michaux (00:40:25):

Yes, that's true. But they're like electricity. It can be used effectively and it can be used poorly. They have to be challenged and guided and they have to understand what's really happening. I like talking to post grads because they're the ones that in 10 years time will be in charge of things. It's their choices, which will get us through this or not.

Nate Hagens (00:40:51):

Yeah, I love that. Younger than that, it's still important to understand the world and how all this fits together. But you find post-graduate age are when they're able to apply this in a new direction and develop new things.

Simon Michaux (00:41:06):

Yeah. They also tend to be less tolerant for political expediency. The things that we put up with as adults, that we put our will, that's just necessary. They run right over the top of that and they won't tolerate it. They tend to be very green and very raw and often not attached to the way the world works in reality. But they're not that interested in bullshit compromise, so I find them to be useful.

Nate Hagens (00:41:38):

Since our last podcast, there's been a lot of news and new releases on the concept of artificial intelligence. Chat GPT four is out. Chat GPT five is being trained up. Some global organizations have suggested that expanding AI and data collection to closely monitor our resource use, even at the individual level, using smart monitoring, et cetera. What are your thoughts on this and is this sort of smart consumption part of the future that you envision or is that dangerous?

Simon Michaux (00:42:21):

There are several answers to that. First of all, the people who are developing this technology at the moment seem to be developing it to the benefit of a very small number of people. While the rest of us get hung out to dry. What I mean by that, is when we're actually mapping resource, yes we want to manage resources, we want to

understand what we're doing. Yes, this would be if it was used effectively, AI and machine learning would be the best technology to do that.

(00:42:51):

But can it be trusted and can the people who are developing it be trusted? The reason I go to that, is I hear a lot about, for example, the fourth industrial revolution. Where they actually want to merge us biologically with surveillance state. They want at the end of a button what each individual person is doing inside their home. They want their smart TV to surveil. They want their refrigerator to monitor what's in the refrigerator.

(00:43:20):

That's not necessary. If we're after about resources, all you need to do is actually work out what gets consumed at the local shopping mall. You don't need to surveil the individual and you don't need to surveil the individual in the home. You don't need to have a merging of humanity is merging with technology and surveillance at a biological level. What's really needed is as a society level, we've got to merge with the environment.

(00:43:47):

What I'm getting at here is the system that's been put in place over the last couple of years, I think is guided to the purpose of how does a small number of people keep a large number of people in place to consume less? We're heading towards, I like to say that the movie Elysium. Where the rich people are off somewhere else and they've got all the technology and wealth in the world, everyone else is starving and scratching around for resources.

(00:44:15):

If we were to get control of the technosphere, if we were to control it, society at large, not like a small number of us. Technology genuinely became a tool, then yes, it would be very useful in mapping the resources. We've got to evolve as a society to the point where we learn to control the technosphere, not the other way around. And we've got to socially evolve where we the people are genuinely a democracy as opposed to being herded into one corner by a small number of people.

Nate Hagens (00:44:48):

I know that's not your area of expertise though you may have your morning drawings when you wake up on that. But do you have any speculation on how we might democratize the technosphere and move towards that direction rather than a Elysium state?

Simon Michaux (00:45:06):

Yeah, I don't know the answers to a lot of these questions. I can feel it, it is coming. I think if we actually treat it like all the other sustainability problems, where we map the actual problem out and see where the nodes and bottlenecks are. Then go to those nodes and bottlenecks, and we either control those bottlenecks or we shut them down. I think the invention of AI, I can't see it getting to the point where it can mimic human behavior in terms of lateral thinking of moral judgments.

(00:45:45):

I don't think it's going to be able to do that. But the other things it can do, and especially if it becomes a legal enforcement tool, we are going to create a very serious problem for ourselves. I think the solution here is more people need to understand it, understand what they're looking at and they need to do it quickly. How that is or what it is, is not my expertise.

Nate Hagens (00:46:13):

Mine either. Though I'm hella worried about it. Because I think it's going to accentuate a lot of the other risks that we face. But I do like the art, so beautiful. You foresee then Simon, that overall a new system is almost for sure going to require a smaller material footprint.

Simon Michaux (00:46:39):

Yeah.

Nate Hagens (00:46:39):

Even if lots of policy people, government leaders agreed with you, we are still, as I mentioned earlier, enthralled to a market system which requires growth to maintain. How can a country or even a county or a city start right now after watching this podcast, on what you are proposing in the face of an uber focus and a cultural consensus trance on growth and markets?

Simon Michaux (00:47:12):

First it starts out with the energy system. What energy system do you have to work with? If you're going to knock out oil, gas, and coal, what systems are left and what-

Nate Hagens (00:47:25):

First of all, are you really talking about knocking out oil, gas and coal or just dealing with less?

Simon Michaux (00:47:30):

No. We will need oil, gas and coal because we haven't actually done any work at all. Or we've done very little of the work needed. So we'll need those fossil fuels to actually construct the next industrial era, whatever that is. But when we do, we have to be very aware that when we are using that energy, it has to be for a strategic purpose. Whereas at the moment there is no thoughts given to how we use energy or why or where. Now the focus is, the long-term focus is, what new non-fossil fuel systems are being dropped in place? That is the starting seed for everything industrial. It starts with the energy, then it goes to the industrial and then it goes to the human population. We'll have to rearrange around that. Then food production will have to go to the population.

Nate Hagens (00:48:19):

But as you and I know, energy is the master resource and it's not evenly distributed. If people in countries or counties are listening to this, unless there's some global government, energy underpins everything else. I live in Wisconsin, there's no coal oil or gas in our state, so we import it from other states. The inference then is decentralized energy, which gets back to renewables. On your first podcast with me you said we don't have the minerals and materials for the batteries and the backup and everything else. If energy is the precursor, how do we think about that? Or how do people listening to this, think about it?

Simon Michaux (00:49:09):

All existing systems are not good enough. That they won't be good enough to actually keep the system going as it is. First of all, we have to understand that we're moving into a low energy future, that's actually going to be quite a bit lower than what we

thought. Second, we need a breakthrough on one of the energy systems in front of us at the moment, has to give us a breakthrough if we're to get out of this.

Nate Hagens (00:49:33):

What are the energy systems? What are the options there?

Simon Michaux (00:49:36):

Okay.

Nate Hagens (00:49:37):

Briefly.

Simon Michaux (00:49:39):

If we can actually scale back what we do and how much we do. Much of what we do in terms of manufacturers is just not necessary.

Nate Hagens (00:49:47):

Like the gallium on the screens, for example.

Simon Michaux (00:49:50):

Yes. Also, the quantity. If we can scale back what we need when we're not so wasteful and we're not so materialistic, that changes the rules on how much we need, which means we can go to a smaller system. Then if we also start thinking instead of having a massive power plant in the center, like a big wind turbine that's 800 meters tall, we're not going to be able to manufacture a lot of those. But what if we manufactured lots of small ones out of bits that you'd find in your average car?

(00:50:27):

Pull the alternator out of a car and attach it to a couple of blades and you can innovate your way out to actually make a small system and then have our energy needs come off a small system. This is the kind of problem solving. How much is that practical? That's another conversation. You've also got to be very clear about what we're harvesting from the environment to do that. One of the things I'm looking at is an evolution of the nuclear fuel cycle.

(00:50:53):

The existing nuclear fuel cycle cannot help us. It cannot expand fast enough, it's too complex and it's too dependent on fossil fuels. Then you've got the alternative fuel thorium. Now thorium conventionally is very promising because the fuel that comes out the other end is much less of. Conventional uranium for example, the fuel rods that come out are still 95% of the mass that you put in is still there. It's very radioactive. Whereas thorium only three or four or four or five percent of the mass of what you put in is left and unburnt.

(00:51:33):

You only have to keep it for 300 years or so, not 10,000 or whatever it is for the conventional nuclear fuel cycle. The problem with thorium is it's very impractical at the front end. You've got to put the fuel into the reactor, convert the thorium to uranium 233. You've then got to take it out of the reactor to actually extract some of the things that are not helpful. There are certain elements that went in with the fuel rod. You've got to clean it and then you put the clean fuel back into the reactor for a second go.

(00:52:01):

Then you can generate electricity. It's very complicated. It's a pain in the ass and people say, we prefer uranium. I'm now looking at an evolution of the thorium fuel cycle called thorium molten salts. Now the molten salts can be made at a mineral processing plant on a mine site. It is mildly radioactive, but with some basic steps, can contain it. You put the molten salt in the reactor. You don't have to take it out and you consume it up and then material is about four or five percent is left over at the end that is unburnt fuel and that can be then removed. If that was possible, then we now have a system that is actually useful to us.

Nate Hagens (00:52:50):

How much thorium is there?

Simon Michaux (00:52:52):

About four to five times what there is in terms of uranium. The other problem is how do you get that thorium? Usually it's in Monazite sand and it's-

Nate Hagens (00:53:02):

Monazite?

Simon Michaux (00:53:02):

It's like a mineral sand that comes out of a granite. Apatite granite. You've got a problem with, usually when you're getting rare earths, thorium is a waste product and it's very hard to get hold chemically. I'm working with a group that's actually doing that. We're using a form of plasma to actually adjust the texture of the Monazite. Which means it can be extracted hydrometallurgy much easier. Which means we can get rare earths but also the thorium as well without sending the stuff to China.

(00:53:39):

The whole value chain gets rearranged. If we can actually make thorium fuel at any Monazite deposit. There's quite a few in America and it's worthless at the moment. But if we can actually make thorium fuel and a mine site in America. Then you can actually say, a thorium reactor only needs a very small amount of material for it to run because it uses almost all of that material. The waste product that comes out the other side is much easier to deal with. That is a technology that could change the architecture of everything else.

Nate Hagens (00:54:17):

Well here's the problem I have with that. Is if that is true and it works out the way that you said it, it's not going to be used in this smaller Arcadian economy. It will be used to power the super organism and GDP and everything else.

Simon Michaux (00:54:36):

The other evolution that might be possible is, if it was possible to make what's called a small modular reactor that could fit in-

Nate Hagens (00:54:45):

Which are in the news and very like the USDOE is very positive on the SMRs right now.

Simon Michaux (00:54:53):

Right. If that's possible then we can actually make small units of it and we can break the value chain up. The problem I see with all this is, we need this to be operating now. We can't wait five to 10 years to get our act together on that. Because things are

going to fall apart in the meantime. It's not going to save us from for making these problems, but it's more a long-term goal to try and establish.

Nate Hagens (00:55:21):

Conceptually in our first podcast, one of your critiques on conventional nuclear power is, it's expensive and it takes a long time to build and we need a lot of plants to replace. But what about thorium? Could it be done much quicker in theory?

Simon Michaux (00:55:41):

If the small modular reactor is possible then you could make them quicker. There's less power that comes out of thorium than what comes out of uranium as a system, so it won't be as effective. What you've got is much less electricity being generated. But we've got some electricity being generated. If you have a system that contracts in size and it contracts around what energy plants that we have and you have a much, much smaller industrial system coming out, then it comes down to what do we use that power for?

(00:56:15):

In the Arcadian blueprint idea, if we could have power systems that are small and targeted to a specific outcome. Where instead of having ubiquitous technology everywhere, like we have at the moment, we have a combination of high-tech examples are around a very small the quality outcome. The rest of the time we are more attached to the practical elements where human beings do more of their own work. More of us will be involved in our own food production. More of us will be constructing our own furniture and we'll be doing it instead of going down the shop to buy new materials, we'll try and reuse materials. That's sort of thing. It's a combination of everything put together and you've got a hybrid society that so far doesn't exist.

Nate Hagens (00:57:14):

Well, building on that, you're a big proponent. We're going to need a new social contract or a different social contract that unites people. What do you see being held in such a social contract? And just speculate on how we might get from here to there.

Simon Michaux (00:57:31):

At the moment we are completely isolated from the consequences of our actions. How am I going to say this? We're isolated from the consequences of our actions in our choices. When we go down to the shop to buy something. We buy it. We don't care where it's come from. We use it without a second thought and the only metric to use it was what it cost us. Then we throw it away and when it goes in the bin, we have no idea where it actually goes. How we see both energy and materials and the environment, all of that has to go. We're both the bottleneck and the solution.

Nate Hagens (00:58:22):

Well a lot of people are trying to have apps on their phone that shows how many calories they eat. Others are showing how much carbon is in this product. Now we're getting ones that shows how much energy is in this product. What you're saying is we need to be a lot more connected with the information of how and what we consume, as a first step?

Simon Michaux (00:58:46):

As a first step, but then we've got to show up. We've got to put our face in the fight. You can't just have this nice app on the phone. Oh yeah, that's nice. And pretend you're doing something about it. You have to actually change your behavior after you change how you see things. We've got to collectively understand in a situation awareness what's happening to us and the fact that the actions of the individual in cooperation with everyone else is actually the path through this.

Nate Hagens (00:59:16):

That's where we're going to need Arcadians as opposed to Vikings and old school.

Simon Michaux (00:59:21):

Yep, that's right. If the Arcadians couldn't be bothered coming to work, then we stick with the prepper community and that's as far as we go.

Nate Hagens (00:59:32):

Which would still be better than Vikings and old school. But Arcadians is the high bar.

Simon Michaux (00:59:39):

There is a map out of this. I became very interested in the Venus Project when I saw it a couple of years ago.

Nate Hagens (00:59:47):

Jacque Fresco?

Simon Michaux (00:59:48):

Yeah, Jacque Fresco. He would've been an amazing man to work with. It presented as a pure cornucopian. Like high-tech solutions. It wasn't really tethered to reality. But the genius of the Venus Project is not really discussed and presented. It's the basic premise. If we were to truly understand what human society actually needed to attend to the needs of all the members of that society and we were to science the shit out of this, what would that look like?

(01:00:20):

If we were to actually bring everything that we had to bear in terms of our science understanding. I used to live in a city called Yegg in Europe. It was 1500 years old. It had layer upon lay. Had Roman ruins. You had medieval cathedrals and everything sort of worked, but it was awkward as hell to get around. Then you get to go to Helsinki and everything just works. The difference is, Helsinki in 1919 when they got their independence, the Finnish government got together a whole lot of town planners and academics together to have a discussion of how they should develop their cities.

(01:00:56):

They developed a plan and then they went and did it. The outcome is Helsinki is actually a city that's actually very well planned and everything seems to work quite well. This is the basic premise behind the Venus Project. My thinking now is, what would happen is if the Venus Project met the prepper community? Now the prepper community is working on the assumption that they will get no help from others. They'll be in a small community and the only thing that happened in that community is what they themselves make.

(01:01:30):

But what would happen if there was a network of communities and science and technology was able to help? If we changed that science and technology to meet the limitations of low energy, very short supply chains and you have to work with what

you've got. If we were to science the shit out of that and then look at the needs of society, what would that look like? That's what my thinking is at the moment.

Nate Hagens (01:01:57):

If there's ever a movie based on you and your work, I would Matt Damon to act as Simon Michaux. Do you have any further clarifications or comments on your new paper called a Resource Balanced Economy that you're sharing? Or is this a good enough teaser for what you're proposing?

Simon Michaux (01:02:24):

There's always more. Always. What I would say is that document has been written to talk to people in the existing system. There are certain Trojan horses in that document that are hidden in the text - call em' Easter Eggs if you like - that imply some of the very serious problems that we are facing, but we are not able to talk about out loud yet. For example, when I talk about food, we have to produce our own food.

(01:02:56):

We have to phase out petrochemical fertilizers, so we have to do it differently. If we can't transport things very far, then a population center with whatever work it has to do, has to be local. But our food production has to be local as well. Now we're talking about the carrying capacity of the local environment. How do we manage that with regard to the number of people that are there now? What I'm saying is, this document is the polite starting hors d'oeuvre to the conversation, which could get quite serious.

Nate Hagens (01:03:31):

I am highly confident you will again be a repeat guest on this podcast. Do you have any ideas of a topic that you are passionate about and would like to take a deep dive on another future conversation?

Simon Michaux (01:03:45):

One of the things I keep coming across is we are very tribal. Especially in this space. Where either the world is full of swings and roundabouts and roses and rainbows and everything's going to be fine. That's one tribe. Another tribe is, we are doomed as in we're done, we're finished. That's it. Slash your wrist now. You are not allowed to be in between. You're either in a group that's actually looking at technology that's useful or

you're in a group that says none of that can exist anymore. What if we were to actually navigate and problem solve our way through this by looking at unorthodox ideas on how they might change the architecture of the system we're looking at, which would change what is possible?

Nate Hagens (01:04:35):

I love it.

Simon Michaux (01:04:37):

Yeah. There's a list of technologies. There's simple things like hemp and bamboo could change things. If we've got 3D printing going where you're actually making the feedstock for the 3D printer locally, that changes things.

Nate Hagens (01:04:55):

I'm having a podcast next month with a woman from Lebanon. Lebanon has 50% unemployment and a thousand percent inflation. She's looking at creating packaging for local transportation of goods and stuff using local ingredients like potatoes and algae. This is the sort of thinking. Have you actually briefly looked into bamboo and such and hemp?

Simon Michaux (01:05:26):

Very briefly. Hemp's a fiber. Talking about industrial hemp, not the stuff you smoke. You can make hempcrete has building material like a geopolymer. You can make it as a fiber for textiles and you can make plastics out of it.

Nate Hagens (01:05:46):

I'm just spitballing here, but if we did use industrial hemp, we grew it and it grows a lot in one year. Because we have ditch weed around where I live and it grows 10 feet tall. Then you chop it down and turn it into concrete or hempcrete, I would imagine that's a much better CO_2 full cycle. Because you're drawing down CO_2 as the hemp plant grows and then you're putting it into something in a building.

Simon Michaux (01:06:14):

It changes the rules for all sorts of things. Also, if you have a value chain that stretches over a large portion of the country, you've got Portland cement and you've

got gravel and you've got the this and you've got the that. If you were able to make everything with a relatively simple technology package that is all local and you are actually talking about something that is biomass to start with. To turn it from biomass into something useful is relatively low-key. Yes, it changes the architecture. There's a whole lot of these things that we could do. When we're faced with a difficult situation where if we don't come up with something, we're all dead, don't you think we're actually going to consider the unorthodox ideas when the orthodox ideas fall over?

Nate Hagens (01:07:03):

Well that's what these podcasts are for is to act as an overton window for some of the people listening to apply these ideas and have their own hypnogogic state when they're sleeping and drop an idea that they take to their office and their manager or their president or whatever.

Simon Michaux (01:07:25):

I get people talking to me about this when I try and propose solutions. The amount of winging that I hear about this stuff. Because they want the usual track where this won't work or that won't work. Or we should talk about something else. My message to those people has become as follows. You either come along with me with my ideas and try them. Or you lead and come up with your own ideas. Or get out of my flight path. Because these people will waste my time and there are people I can be working with instead.

Nate Hagens (01:08:00):

Yeah, I hear you on that. It applies to my job as well. That's well stated. Lastly my friend, not to put you on the spot. But earlier this week you woke up and did a drawing and you shared it with me and said, "Nate, this is what I do when I wake up in the morning." I have it on my screen in front of me and I could share it with the audience. Can you just describe, if you remember what it was. It was something about ocean, salinization and solar. Can you give a one-minute summary of what you were thinking when you woke up that day?

Simon Michaux (01:08:38):

The problem is as follows. I'm helping a colleague of mine develop an area on the coastline of Peru. This coastline is desert. They only get rainfall like five, six days a

year. It's very, very dry. There are no living things there. It is bare earth. He wants to start a settlement there. He said, "Look, there's already drinking water shortages problems and there's food shortages coming and there's a big drought coming as well in progress.

(01:09:09):

What do I do?" I came up with this idea where first, at GTK, the geologic survey I work with, one of the jobs we do is to go into areas that have been sterilized by industrial agriculture. An arable land has been sterilized to dirt and cannot support life anymore. How do we fix that? First you fix the mineral balance. Then you've got to add your organic content to it. But before all that happens, we need water. After understanding the watershed of the area, the hydrological watershed, so you can work out where this might work.

(01:09:49):

I had this idea where if they've got sun so much of the time, can we use that? I came up with an idea where you pump water from the sea uphill. It's like a gently sloping land that's average height is 80 meters above sea level. Put it into a dam at the top of the hill and evaporate the water off that. When I was a scout as a boy, in Australia when we are actually short of water, what they said was dig a hole. In the hole, you put in some tree leaves and plants.

(01:10:22):

You put a plastic cover over the top of that and a rock in the center and under the rock you put a cup. Water evaporates out of the leaves, condensates on the plastic, rolls down and then drops into the cup. Like about a quarter of a cup of water. It's not much, but you can drink it. Same principle. You have a big reservoir of seawater and you have glass panes in a inverted V-shape. The water evaporates off that, condenses on the glass, runs down to the center into a trough.

(01:10:53):

The trough then collects into a water tank of potable water. To get to that point, all we are doing is pumping water up the hill, which is essentially a pool pump. A domestic pool pump. Put a couple of solar panels over that and a very small battery and it can run indefinitely like for a couple of hours a day. Collect that water and then you can irrigate it out to parts that we are going to convert into arable land. To do

that, because evaporation's a problem, there's lots of desert reclamation technology that the Israelis have developed.

(01:11:25):

I think the Chinese are doing it too as well now. Where you then have that water drain with gravity in pipes under the ground, so it's not going to evaporate. Into the area where we want it and then you perforate that pipe. Then in the pipe you have gravels so it doesn't silt up. And you are drip feeding continuously water, potable water into specific areas before it can evaporate. You evaporate the water during the day and you irrigate during the night.

(01:11:52):

Okay, so now we have water where we need it. Then you go into the area and you do a series of soil tests to work out what minerals need to be present and what minerals need to be taken away. Balance that minerals for that area. There is also, you need to add organic content. There was a nice case study I like to use where a couple of, I think it was anthropologists went out to a desert part of the Amazon jungle that had been forested out and was completely barren.

(01:12:25):

They did some tests and they worked out what they needed to do. They got several hundred tons of rind from oranges from a fruit juice factory and they just dumped it on the ground and they just left it. They walked away. I think it was five or six years they came back and the whole area had reforested. The organic stuff has to break down and the soil food web has to reestablish itself. We're talking about what pH do we need and what organic matter do we need?

(01:12:54):

They're the building blocks. We then with permission of the Peruvian government, go into the Amazon jungle and get some of the soil from the Amazon jungle in a small amount and we put it into one of these areas. The bacteria in that soil will start the food web again. Now the food web's established, it's been irrigated regularly. We've got a source of water. The building blocks, soil food web are in place. Then in a subsistence way where you're below the carrying capacity of that soil food web, you can start to grow certain crops that are suitable for the region.

Nate Hagens (01:13:31):

I had two thoughts while you were saying that. Three. One, that's awesome. Two, picturing you as a boy scout when you were young. I can picture the boy scout hat with a superman shirt and an eight-year-old Simon. Thirdly, I don't think either of us could manage this, but there would be worse things to do than for me to do 10-minute podcasts with you every morning based on whatever you drew that morning when you woke up.

Simon Michaux (01:14:00):

Yes. Some looks a little strange. Something you might be a little worried about. But sure.

Nate Hagens (01:14:08):

Thank you so much my friend. To be continued. You are a global treasurer and I really hope that there are more Arcadians to be that are influenced by your work and your conversation and your human spirit.

Simon Michaux (01:14:27):

As are you. You might not know this, but you've also got a following.

Nate Hagens (01:14:31):

To be continued, my friend. Thanks Simon. If you enjoyed or learned from this episode of The Great Simplification, please subscribe to us on your favorite podcast platform and visit thegreatsimplification.com for more information on future releases.