

The Great Simplification

Luther Krueger (00:00:00):

It's a distribution problem. I remember reading this long ago, the food is here, you got to get it there and it just doesn't get there. Well, the same for this particular tool for when they do have the food, but they have no way to safely cook it. They get it to them.

Nate Hagens (00:00:16):

Today I'd like to welcome solar cooker expert, Luther Krueger to the show. This is an odd topic for this show. We're going to talk about solar cookers. I have one, I've always been fascinated by them. This falls right square in the middle of the Goldilocks tech category where we get a very important human need, cooking food, with very minimal energy input. Luther Krueger has been collecting, designing and promoting solar cookers for over 20 years through community education courses, demonstration at farmer's markets and recently, he's been traveling across the US to create video interviews with solar cooker pioneers and practitioners using solar ovens. He and I discussed the basics of using solar cookers, how they might apply to a future with lower energy throughput. This is a great whirlwind tour of the different technologies available to cook food outside using the sun. Please welcome Luther Krueger.

(00:01:30):

Luther, great to see you.

Luther Krueger (00:01:32):

Good to see you. Thanks for having me.

Nate Hagens (00:01:33):

You are welcome. You are an interesting guest. Former policeman turned solar cooking forensic museum scholar and practitioner.

Luther Krueger (00:01:46):

Yeah, just quick correction. I was a civilian with the Minneapolis Police Department, so I would've been a hazard to others and myself if I had to carry a gun. Happily, 28 years, no weapons.

The Great Simplification

Nate Hagens (00:01:58):

How did this transition come about? How did you get interested in solar technology?

Luther Krueger (00:02:05):

Sure. Well, I've always been an environmentalist since I was in junior high and read Rachel Carson's book that I'm sure a lot of people have read. I probably only read a chapter or two, but it just struck home how badly we are taking care of the planet. We weren't taking care, we were destroying it really. Forever it's been in the back of my mind and eventually I just discovered solar cookers, the actual manufactured ones, when I picked up my brother after he got out of the Navy in Norfolk, Virginia, and I didn't have time to talk to the guy with the store, but he gave me a book called *Cooking with the Sun* by Beth and Dan Hallisey and they were solar engineers in the fifties and sixties and out of just plywood, you could make a box with a cut at a slant, put a sheet of glass over it, reflectors aluminum foil, and you're talking almost 300 degrees worth of cooking power, just straight sunlight fed into the pot, and so I was convinced.

Nate Hagens (00:03:07):

We're going to get into all that. A footnote is if Rachel Carson were alive today, I think she would be very upset. Things have gotten unbelievably worse since she wrote that book.

Luther Krueger (00:03:23):

I agree.

Nate Hagens (00:03:23):

At the core of why I want you, as a guest on this program, is I think, and I know you follow the podcast, that we're headed for a world in coming decades where we're going to have to get 80% of the things that humans need and value with 20% of the resources we're using today.

Luther Krueger (00:03:50):

If that.

The Great Simplification

Nate Hagens (00:03:50):

I'm starting to refer to this as Goldilocks technology, not too hot like colonizing Mars and flying cars. Not too cold, stone tools, but something that assumes that interconnected society holds together but needs to use less fossil energy and more appropriate tech. I don't know a lot about solar cooking other than I do have a solar oven that I use in the summertime and I can put anything in there in mid to late morning and it's done by mid to late afternoon, but I don't have to worry about it overcooking and I don't use any energy in my stove or my oven or anything.

(00:04:40):

We're going to get into that, but let's start at the broad macro. As a primer, can you inform our guests, of course, almost all of humans in the world cook their food. Could you tell us the current landscape of the most popular cooking methods in the world, whether environmentally, sustainably or low resource use or not?

Luther Krueger (00:05:06):

Okay, so if you're talking about what we are pretty much everyone is cooking with right now, gas ovens, electric stoves and so forth, that's really the current, 99% of the households have four or five variations on that theme and they all draw energy from fossil fuels, most likely, maybe some of their electricity is from wind or solar, but they're part of the grid, they're part of the pipeline for gas and the situation is such in some cities. New York City, I believe, has said they want to phase out new construction with gas and go to totally electric because of internal pollution inside the home. California, I don't know the status of it, but they were looking at statewide doing the same thing and it should have come to light years ago, but now it's starting to, the chickens are coming home to roost.

Nate Hagens (00:06:00):

Okay, so that's United States, Canada, Europe. What about all 8 billion humans, though? A lot of people in India et cetera still cook with wood and dung and other things, yes?

Luther Krueger (00:06:15):

The Great Simplification

Yes, and that's a big concern because of deforestation. When I first heard about deforestation, of course, I pictured a bunch of stumps of trees, but when I had it described to me how one particular mountainside got deforested and then the erosion happened and then the villages flooded and then the cascading detrimental effects of that were just beyond catastrophic. I mean, killing people and so forth, but people have to cook with something if they want to make sure they have safe food to eat and they're going to get it. If they have to walk 10, 20 miles. The stories in Africa are chilling how far they have to walk just to get that.

Nate Hagens (00:06:59):

I was just in India last month, two months ago, and even in the relatively well-to-do area that I was, every day you saw people with stacks of twigs that they had to walk and pick up and they were bringing that to cook their food. There's two issues there. One is the sustainability of how big are the forests and how much deadfall is there to sustain a community. There's also the burning of that has carbon and soot and other air quality problems. I have this solar oven, it's made out of plastic and fossil inputs, but it's made once and so far I've had it for seven years. It doesn't work as well as it originally did, but every time I use it, there are zero external inputs. I just get the incident sunlight and I have to move it once or twice to follow the sun. That's why I contacted you because why is that not more prevalent in the world, especially in Africa and India that have a lot of insulation and more material poverty and more deforestation? It makes no sense to me. Bring me up to speed. What are the key issues that I should be aware of and then I'll have some follow up questions.

Luther Krueger (00:08:23):

Sure. That's the eternal question. Solar Cookers International, which has done a lot of work overseas to try to answer that question. They have several answers. One of the first ones is the cultural barriers. Can this thing that we're handing them as the western world solution to their problem, can it cook that traditional dish the same way? Some of them want the smoke in the flavor. A lot of it, my opinion, having talked to over 100 people who have tried to promote solar cooking in the US and abroad is if we're not doing it here, they're going to say, "Well, why should we?" That's another cultural barrier. Do they really believe it? Why are we bringing it to them but we're not

The Great Simplification

using it. There's a lot of suspicion there. And by the way, the woods, they are still there. They're only 10 miles away now instead of eight like last year.

(00:09:18):

It's sad, but it's their experience also, one cultural thing that they have found is a lot of those walks we think of them all walking through war zones. Some of them are very treacherous areas of conflict, but a lot of them are through their friends and relatives villages. There's actually a little bit of a social activity being able to go get the firewood. One story I heard was this family said, "We don't want to do it 'cause we'd never be in touch with uncle so-and-so five miles away and get the latest scuttlebutt on the rest of our family tree."

Nate Hagens (00:09:54):

It's not like these people are sitting there doing the cost benefit of how many fossil fuels and what's the environmental externality and a solar cooker would clearly be the best. It's how it fits into their current life and culture and social interactions.

Luther Krueger (00:10:09):

That's largely it. On the other hand, several that have come back from areas like Haiti or several countries in Africa, they'll say they will give a presentation and talk about all the environmental benefits and the people will say, "We get it. We do know that." A lot of them, they understand that. Of course, even though they're missing some of the traditional interactions with their villages and so forth, they do start to resent all that extra walking they have to do, so it's a little bit of everything there.

Nate Hagens (00:10:43):

I'm getting ahead of myself because I'm so excited about this topic. Let's take a step back and for those people that have never heard of this, maybe you could unpack what is a solar thermal cooker? How does that differ from solar PV? What's a little bit of the history? You are the purveyor or how are you related to the solar cooker museum? I mean, you have a lot of knowledge on this topic.

Luther Krueger (00:11:14):

The Great Simplification

Sure. Well, the museum is my collection that I built up over 20 years. I've got just short of 90 unique cookers that have been manufactured around the world and in ordering them and trying to find them, I've interacted with the makers of them. Some of them haven't been made for 30 years, and so I've learned a lot about how they have put them together, what troubles they had trying to sell them. One fellow told me, you want to make a million dollars with solar cookers, you start with \$2 million. The business is... Not enough people know about it and realize the benefits. Plus, I mean in this country at least we're so spoiled. We just turn the dial on our stove and our chicken is frying, so there's that part to overcome.

Nate Hagens (00:12:01):

It's a convenience thing and it's a sunk cost momentum thing. This house where I'm, my office here, has a stove and an oven and a microwave, so why would I need to go out and buy a solar oven because I already have this office and all the infrastructure is ready to cook food. If I was starting from scratch, I might say, "You know what? I'm going to use a solar oven. It's going to cost me a little bit more time," over the long run, especially in a world headed for less availability and higher costs, it will be more resilient, more healthy for me and cheaper, but I'm not sure that I would make that decision given the sunk cost of my current situation.

Luther Krueger (00:12:47):

Sure. In fact, I think a lot of people think, well, it's got to be a lot of extra work. I'm going to have to learn this new device. Well, you had to learn your stove top range or your induction cooker. If you have an induction now or your halogen has different characteristics, it's really no different. I actually think it is a lot simpler because remember that Popeel advertisement, just set it and forget it? Well, look at your cooker there. You pretty much forget it unless you got a lot of volume and you got to move it around a little bit. Right?

Nate Hagens (00:13:15):

Well, what is a solar cooker? Let's start there.

Luther Krueger (00:13:19):

The Great Simplification

Yeah, we'll start with the solar thermal, essentially. You got the sunlight hitting the ground where you're at or hitting the wall of your apartment building. All the charts I've read up on, it's a kilowatt per meter squared worth of energy. Variations based on particulates in the air from pollution or haze, hazy clouds, what your altitude is and so forth, but basically that's the purest energy, there is. There's no intermediary force that's stopping you from using it. If it hits the ground, you can use it. A solar cooker, thermal solar cooker takes that energy, captures it, concentrates it, and it transfers to the food through a pot, through any cooking vessel. In some cases it's a turkey bag with the food right in it in a hot pot or what have you. That's solar thermal. It's pure solar energy converted to cooking heat for the food.

Nate Hagens (00:14:15):

Does the solar thermal cooker, what is the efficiency and ease and time differential depending on if the sun is directly overhead or early in the day or late in the day or in winter? Does that angle of the sun make a huge difference?

Luther Krueger (00:14:33):

It does make a difference. Although, I have to say it just depends on the cooker you have. If you have a nice sized parabolic, you can basically start collecting that energy at the sunrise. It probably won't be enough to cook with for maybe a half hour or an hour because it's going through a lot more atmosphere at that low angle. Once you hit nine o'clock in the morning, 10 o'clock in the morning here in Minnesota where we're at 45th parallel, basically up here in Minneapolis, that's going to be enough to cook for 6, 7, 8 hours, in the height of summer, you can go eight or nine hours really with that. In the winter you might only have three or four, but with a parabolic you can cook several meals, multiple meals in a row. If you use a hay basket to put them aside one at a time and put another meal in.

(00:15:19):

Box cookers, they need to be insulated to really be effective. The commercial models out there, such as the one you have, I believe it was the Solavore Sport, that one is very well constructed, very high-tech insulation, and as you mentioned, it's plastic but it's not single-use. Those are solar thermal cookers and they range from simple panel cookers that just cook in a pot with a reflector that hits the pot. Often the pot is

The Great Simplification

covered with a Pyrex bowl or the turkey bag as they call it, the oven bag. The box cooker does the same thing only as a dedicated space that contains the heat. Parabolics, those are like the stir-fry cookers. They hit very high heat and you can fry with them.

Nate Hagens (00:16:03):

Okay, so that makes sense. That's solar thermal. How's that different from solar PV cooking?

Luther Krueger (00:16:10):

Sure. Well, with solar thermal, it's the direct sunlight hitting basic elements, basic pieces of a cooker to concentrate it on the food in the pot and the food. Photovoltaic is the panel that might have wires directly to a cooker. For instance, you could do a DC cooker. I think the microwave, I know one fellow told me induction cookers can be DC and as some have done, which I think is it Kris De Decker might've mentioned they have a DC just direct to a heating element. I visited Alexis Ziegler in Virginia to see his Living Energy Farm in February when I was able to take a quick trip out there to capture that. That's exactly what he does. Solar panels that go direct to a very highly insulated oven box that over time can build up the heat and cook for a dozen or more people that live on the farm. Of course, the steps are you need to get the panels. Before that, the panels need to be made. Before that, the stuff has to be dug from the ground, etc, etc. There's a lot more involved with making it and putting them to work. It's also a level a little beyond most people's DIY, which you can make any solar cooker without a lot of skills. A thermal cooker.

Nate Hagens (00:17:32):

I have very little DIY and so I bought this solar, you know what I have, right? I showed you it's just a square with the plastic on top. It works great. I don't have to do anything. How much energy do we use from ovens and stoves and microwaves as a percentage of our energy? I don't know if you know that.

Luther Krueger (00:17:56):

All I know is for my household, we just installed a heat pump and before that we looked up our gas a percentage, 90% for heat, 5% for heating water, and 5% for our

The Great Simplification

stoves. Now, that 5% was based on the quote we got to install the panels and we have been doing solar cooking every possible way to not even use the electricity from that. We want to get paid for it since we're on the net metering system.

Nate Hagens (00:18:23):

How much of your food living in Minnesota living that you cook is made using some form of solar oven?

Luther Krueger (00:18:30):

We are probably only a quarter at most. I like to say we live in the variety weather belt. We're at the mercy of the clouds might be--

Nate Hagens (00:18:42):

Just like solar panels for 24/7 electricity and wind turbines, et cetera, there's intermittence for watching a football game might be okay, but intermittence for eating, not so much. That's something that's important, right? If you planned on only cooking your food using a solar oven, there would be days or even weeks that would be tough, yes?

Luther Krueger (00:19:13):

Yes. On the other hand, one trend that I hope increases is the manufacturer of hybrid cookers where it's a solar thermal cooker, but with electric backup, it's an ingenious cooker because you don't need to be near the grid or have solar panels or batteries, but you can still use wood or biomass and it's a rocket stove that shoots right through the box of a solar cooker. If the clouds come in, you just stoke it up and fire up the wood and you're good to go. The reason behind that is a lot of people are not going to give up wood entirely, but they'll adopt a solar cooker if, oh well we'll still cook with it, but we'll just put wood in as well. A dual use or a backup system is needed.

Nate Hagens (00:19:58):

What about Kenya or Tamil Nadu in India that have sun almost all the time? I mean, this makes complete sense from an environmental and a resource standpoint, doesn't it?

The Great Simplification

Luther Krueger (00:20:12):

Absolutely.

Nate Hagens (00:20:12):

Just for just the cultural problems that you said earlier. What would not the best top of the line and not the uber basic, but a solid usable that has a five plus year lifetime solar oven cost, if someone in Africa were to buy one or to be donated one?

Luther Krueger (00:20:33):

Sure. The manufactured models out there in the States, there's the Haines panel cooker, which he ships with his own pot at a cost of \$65, \$70, and he's been involved with shipping whole crates of cookers to various countries in Africa. He's actually explored the use of carbon credits. That's at the low end and it is just a plastic foldable cooker that it'll pretty much last forever. It's just windshield reflector material, aluminized mylar, that's the least expensive. Moving up to where you have, that's probably a three or \$400 model a few years ago. A box cooker, every bit as reliable, probably needs to, my Haines, I just set at the point where the sun will be at noon at nine in the morning and by five we have a piping hot stew for a family of six. A very low cost, and I don't know what he's charging to get it to Africa, but it's got to be pretty infinitesimal.

Nate Hagens (00:21:35):

Luther, as usual, my mouth is faster than my brain and I have overly too many questions for you and I wanted to follow a logical sequence, but I'm too curious. Sorry.

Luther Krueger (00:21:52):

Sure, no problem.

Nate Hagens (00:21:53):

Does the food taste any different? Can you notice or let me ask it this way, you as a solar oven museum curator that has 90 models in your garage or your basement, could someone do a series of meals, an entree like fish, some potatoes, some cookies

The Great Simplification

or something like that? Could the difference be blind if it was cooked in a solar oven or in a conventional oven by taste or by texture?

Luther Krueger (00:22:27):

I don't know if I could, with a blind taste test, I feel I have about half the taste buds of your average person, so I need a lot of spice and so forth. Everyone I've talked to that cooks regularly with solar thermal cookers, they'll say, it tastes different, it tastes better. Joe Radebaugh, who wrote the best book on solar cooking to date, and it's 20 years old, it needs to be updated. He said he talked to chefs who said the longer you can cook something at the lowest possible temperature, the better it's going to taste. It gives the right amount of time for the proteins to break down, for the sugars to be developed, what have you. It doesn't wreck things. You don't get charred food. You get actually cooked food and I see that you've frozen again, but I have, whenever I do my banana bread, that's my old standby, it's the easiest recipe to remember. It always tastes better than when I have it in the gas oven. For one reason, the gas oven will dry out more food necessarily. Instead of with a solar cooker, you tend to not dry it out, so it's going to taste better because you want that moisture to be retained as much as possible.

Nate Hagens (00:23:37):

Can you overcook things like if you wanted to have them out for three hours and then you forgot and you came back at six P.M.?

Luther Krueger (00:23:45):

Yes, you can. I mean, energy is not going to stop, and if you leave something out long enough or if for instance, in a parabolic, if you step away for about 20 minutes, it might get out of focus and it won't cook enough, or you might not realize that it's charring in one corner of the pot because it's not quite calibrated right for the focal point. People say they have burnt stuff in box cookers, which is hard to imagine, but they're down in Tempe or Albuquerque where the sun is more powerful, they're at a higher elevation, so forth. They're getting more of the concentrated energy and it's a little bit of risk.

Nate Hagens (00:24:24):

The Great Simplification

If you have one of these solar ovens, maybe a higher end one or even a solar PV one, can it be used for things other than cooking?

Luther Krueger (00:24:33):

Absolutely. There are whole development programs they're trying to establish around the world for drying fruits and vegetables. One of my favorites is Juana Maria Hernandez in Chiapas approached the family who said they produce a lot of milk and they'd like to sell more of this heirloom kind of dried cheese. That was their specialty for the Chiapas area. She worked with them to put together a solar dryer that would get it at just the right temperature, make sure the humidity level didn't drop too far so it got too dry too fast and so forth. There's all sorts of possibilities for that.

(00:25:14):

In Arizona, the Kerr Coal Sustainable Living Center, they have a solar dryer, which a lot of people in permaculture use, and it's surprising how few of them actually do solar cooking, but they dry a lot of stuff in what almost looks like an industrial scale dryer, but it's entirely solar thermal. Because it's dried at the right temperature with the right ventilation and so forth, the food loses very little of its nutrition value. It's going to be a lot better than drying in your electric spinner thing with the electric heating element.

Nate Hagens (00:25:49):

Let's just take today's economic landscape and ignore what you and I might infer about coming decades, but using today's costs for equipment and costs for energy, natural gas, electricity, et cetera, what are the cost benefit analyses of a solar cooker for someone in the United States or for someone maybe in India or Africa or elsewhere that is sunny?

Luther Krueger (00:26:18):

Sure. Well, the analysis would be fairly simple with solar thermal because you're paying nothing for the sun for the energy itself. There's no other way to put it, the materials. It just depends on how far you want to go with the DIY models for a couple bucks worth of aluminum foil and cardboard and you've got a cooker that's every bit as powerful as a manufactured one.

The Great Simplification

Nate Hagens (00:26:41):

Oh, so you don't have to buy a cooker, you can make a cooker.

Luther Krueger (00:26:44):

Yes. In fact, on the SEI wiki, solarcooking.org, there must be 100 DIY models, and I don't know why people keep trying to make yet another one because they all work. I mean, it's the free energy. If they're somewhat parabolic in shape, even if they're kind trapezoids, they will cook plenty for next to nothing or found material.

Nate Hagens (00:27:04):

Wait a minute. Here's another thing. For people that have apartments or small residences and they have air conditionings running and then they're also heating their food, for a few bucks, those DIYers or even 50 bucks or 100 bucks, they can go and create a solar, make a solar oven, and then not only are they getting the health benefits and the other things you mentioned, not only are they not having emissions, but they're also not heating their home while the air conditioning is going at the same time, right?

Luther Krueger (00:27:43):

Absolutely. That's yet another thing that's just a common statement from the people I interviewed is I just got tired of the hot kitchen and the AC wouldn't keep up with it. Here I'm out in the yard, I'm gardening at the same time I get things done. I don't have to be stuck in a hot kitchen. It might be hot out, so what? I get myself in some shade, but yeah, and the inexpensive DIY models, if you want to just start, there's all these models on the Wiki and get your feet wet. Just about everyone I've talked to that started that way within a year or two, they said, "I really want the juice of these really powerful ones. Maybe the parabolic, maybe a box cooker, something a little more official," but there are some people they've still been cooking with the plywood and cardboard insulation, glass sheet over the top for years.

(00:28:33):

I just interviewed Ed Eaton, Peonia, Colorado. He is a member of a Solar Energy International, I believe is based out of there. He still has this massive plywood cooker with just a glass window. He put it on a trailer and he brought it to demos and he'd be

The Great Simplification

able to cook for 20, 30 people at a time for next to nothing, the cost of scrap plywood and a sheet of glass someone threw out.

Nate Hagens (00:28:56):

Are there any places in the world, any nations or even subsections of nations where thermal or PV solar cooking is quite prevalent?

Luther Krueger (00:29:09):

Both are still way down at the bottom as far as adoption. Interesting that you just went to India because their perception here in the United States is that India is light years ahead of us, but the Indians that I have talked to have said, oh, still no one really knows about solar cooking there.

Nate Hagens (00:29:27):

Where I was in Auroville, there is a place called the Solar Kitchen, which is the center organizing meeting place for everyone in the community. They go there for lunch every day, and that is solar cooking, but not solar thermal. They have solar PV and a big solar oven on. It's like industrial scale, but they do all their cooking with solar. As far as individual people having the things you're discussing, I didn't see that anywhere.

Luther Krueger (00:29:57):

No, and we still have a lot of work ahead of us. We have so many that I sent you that solve a lot of those problems. One particular that came up at the Solar Cooking Conference in Portugal 2020 was, hey, we're in Madrid, and Madrid is a lot of high-rise apartments and condos, and so we can't solar cook up there. Well, this Millen Kulkarni in India heard that same thing from Indians with all they're building up rather than sideways for housing. They don't have sprawl. They got, what'd you call it? They got it tall. He came up with this cooker that you can hang from your balcony that's a slow cooker. It'll cook for a family of three or four, the sun dish, and it's based on a seashell.

Nate Hagens (00:30:42):

The Great Simplification

You sent me this PowerPoint. Maybe we should just go through that and you could speak for a few seconds or 30 seconds on each of them and give the audience a little bit of overview of what we're talking about.

Luther Krueger (00:30:54):

Sure. Well, that first one, it's one of my favorite interviews, this humble inventor, he thinks of himself as just an inventor. He came up with this because he believed in solar cooking and too many of his friends said, "I can't. I'm on the 15th floor or whatever in Mumbai." He says, so long as about two thirds of that building is going to get sun during the day with enough time to cook, you can just hang this thing out of your balcony. It's a Tiffin pot. You probably saw plenty of those, three stacked pots, kind of wire snap together and it'll cook for a family of three or four, at least. You can scale it up to cook for more people.

Nate Hagens (00:31:29):

Let me just ask you a question. In theory, if you're on the side of the high rise, that is the one third where the sun doesn't go, you could just walk across the hall and make friends with your neighbor and do some barter or something.

Luther Krueger (00:31:45):

Yes. In fact, there-

Nate Hagens (00:31:46):

Using their balcony.

Luther Krueger (00:31:47):

Yeah, and there are lower-

Nate Hagens (00:31:50):

Hey, hey buddy in 103, can I borrow your sun?

Luther Krueger (00:31:53):

Exactly. Give me a cup of sun. Absolutely. I mean, that's where it can help build community too, because there are people that aren't going to be in the most

The Great Simplification

advantageous spots to do it. Number two, that's the sun oven. That's probably the most prevalent box cooker possibly in the world. It's been around for probably 40 years, and it is just a box insulated with a kind of pizza grade fiberglass is what I understand. A sheet of regular glass over the top and then four reflectors that basically triple the amount of sunlight that gets reflected into the cooker, and it's an oven for baking. You can get up to 400 degrees.

Nate Hagens (00:32:33):

I've had a version of this in the past, and what I noted is you could cook fish or rice or anything in just the box, but to increase the temperature, like if you wanted to make cookies or something, you would need the reflectors.

Luther Krueger (00:32:47):

Yes, and in fact, I think if the model that you have is the Sport you can order it with or without reflectors, they advise not using them, except maybe in the winter when you have it at the winter angle to get that extra grab of sun. I use it all the time in the winter, again, for banana bread using the reflectors.

Nate Hagens (00:33:02):

Okay, number three.

Luther Krueger (00:33:04):

Okay, and this one is a parabolic, and it's one where I try not to play favorites, but it's hard to not. It's the Sunplicity. Alain Bivas, my undergraduate was in theater and he was a mime, a professional mime who stumbled across a pamphlet on solar cooking by Joe Radebaugh, who later turned that pamphlet into a book. Alain told me, he said the day he saw that, he said, "I'm done miming. I'm going to design the best solar cooker ever made," and he's come damn close. This thing is a parabolic, which is a very powerful shape to begin with. Totally collapsible into about an inch and a half frame, maybe two feet by eight inches, 10 inches, 10 pounds. You can bungee cord it to a backpack. I put it in the trunk of my car whenever I go on my solar cooking road trips, it's the only cooker I use when I go out.

Nate Hagens (00:33:55):

The Great Simplification

How much would that cost me if I ordered such a thing?

Luther Krueger (00:33:58):

Well, the great thing with Alan is he said, "A, I don't want to use any plastic parts." Right away you're talking metal, so you're talking more expensive. It's what they call spectral grade aluminum. Very highly polished and kind of a ceramic coating to prevent scratches and let it age. It won't corrode over time. Right now it's in the 500 euro range, 450 to 500 euros, which is about 550, 600 here.

Nate Hagens (00:34:26):

How long, if I took care of it, which I haven't with my other ones, 'cause I leave them out in the rain and the wind because I forget, but how long would this last, do you think?

Luther Krueger (00:34:36):

The Sunplicity, I think pretty much forever. It's a very high quality aluminum, spectral aluminum high quality metal frame, very solid. I have cooked on a snow bank and it's taken tumbles when the sun has gotten the base warm enough where it melts and it's slid off and I've had to restart over and it survived.

Nate Hagens (00:34:56):

Is wind a factor? Is wind a factor? Can you cook when it's 20 mile an hour wind here in Minnesota?

Luther Krueger (00:35:02):

You can. You do want to brace your cookers because as you can see from parabolics, they're pretty much like a sail. They will grab, you got to weight it down, but once you do, it almost has no impact on the temperature because you're talking hitting up 350, 400 degrees in the parabolic pretty easily at the bottom of the pan.

Nate Hagens (00:35:20):

The parabolic gets to be 400 degrees. What couldn't I cook? I might not be able to get a crispy broil sort of texture, but you could cook anything at 400 degrees, right?

The Great Simplification

Luther Krueger (00:35:35):

Oh, absolutely. In fact, the Sunplicity was meant to be portable and a small family, you could cook an entree for a small family in it, but there are a much larger parabolics. Germany, for instance, the SK-14 from EG Solar, that hits close to seven or 800 Fahrenheit in the focal point. You're talking wok stir fry cooking. You can get your braised chicken, steak, whatever you want in one of those, or boil a gallon of water in an hour and purify it, pasteurize it, or stew.

Nate Hagens (00:36:07):

Number four.

Luther Krueger (00:36:09):

Sure. Now, this is in fact, this is exactly the parabolic I was talking about, the SK-14, one of the best stories about solar cooking halting deforestation, demonstrably halting it. In Nepal, Bhutanese refugees had to cross the border into Nepal, and it was on the order of 110,000, I believe, total with eight different camps. Martin Olthoff from the Netherlands, who was a firm believer in getting the solar cooking message out, heard about this, saw that you could literally, basically define every 10, maybe 10 meters worth of forest was going to be taken down every day for people to cook for 100,000 people. He said, let's get a group together to put these parabolics in their hands in this refugee camp. He raised the funds and the interest and the infrastructure to get 7,000 of them, which pretty much got them cooking right away as soon as they got there and stop the deforestation. It's one of the biggest success stories, very direct impact on refugees, but also preserving the environment for them as they settled in.

Nate Hagens (00:37:22):

Cool. What about number five?

Luther Krueger (00:37:24):

Sure. Well, this is a parabolic, but it's what I call the community scale solar thermal cooker. It's the kind that you may have seen in India about Deepak Gadya and incredible work. The parabolic that he has used as Scheffler reflector. He has it on

The Great Simplification

whole campuses of buildings, heating the water, cooking the food, heating the building, everything. While it's a very well-designed cooker with a tracker, so you don't even have to think about it. The picture I sent, the video is of the Présage restaurant in Marseille, so it's a double duty. It's a economic engine for restaurants where they don't need any fossil fuels. Marseille is a fairly sunny part along the Mediterranean, and we had a great time visiting them for an episode that should be within a week or two going up on my channel.

Nate Hagens (00:38:14):

What is your channel?

Luther Krueger (00:38:15):

It is Solar Cooking Museum on YouTube, so @SolarCookingMuseum, YouTube.com/@SolarCookingMuseum.

Nate Hagens (00:38:24):

What's number six?

Luther Krueger (00:38:25):

Number six, actually the next three are the insides of the cooker of the Cafe Le Présage restaurant. They have a sign out front that says, Le Snack where you can get snacks, quick cooked food because it's such a quick cooker due to the high power of the Scheffler reflector, and basically one of their main cooks showing us how this three foot by five foot griddle cooks everything for people. While he interviewed Pierre-Andre Aubert, who was the proprietor, every minute or two, another three, four people were coming up and being served, and he's got a permanent restaurant there that should open up in a month. He's looking at April or May.

Nate Hagens (00:39:08):

It's kind of fun and exciting, isn't it? And hopeful.

Luther Krueger (00:39:12):

Absolutely. In fact, I have been catching up on your interviews, and I got to say it can be a little bit of a downer, but I'm not cowed by some of the messages because I can

The Great Simplification

see this as being an integral part of people surviving what is to come, but starting now where you're going to survive those high gas costs and so forth, so anyway, I'm optimistic.

Nate Hagens (00:39:40):

I'll get to that. Let's finish your little collage here. What about number eight?

Luther Krueger (00:39:44):

Okay, number eight, that's another cooker. It's a vacuum tube cooker, and it's about a nine or 10-inch diameter cooker, maybe two feet, two and a half feet long. Le Présage, again, uses that to cook one of their signature dishes. When he pulled that out, it smelled and looked like mushrooms, braised buttery mushrooms, just beautiful. It's actually eggplant and it's one of their signature dishes that they cook in high volumes, and it's a France-based cooker that restaurants can use.

Nate Hagens (00:40:16):

Are these a little bit more popular in France?

Luther Krueger (00:40:19):

I think they're gaining ground due to simplicity. Alain Bivas really hit the ground running with marketing it. I mentioned he was a mime, but he got some kind of engineering award for this thing. Yeah.

Nate Hagens (00:40:33):

Well, also there's collapsologie, which there's a collapse aware demographic there that is a much higher percentage of the population than in the US.

Luther Krueger (00:40:43):

Yeah.

Nate Hagens (00:40:45):

Yeah. What about number nine?

Luther Krueger (00:40:47):

The Great Simplification

Number nine, that's yet another community scale cooker, but it's a box cooker. The Sun Oven, the one people mostly know about is the actual family size box might hold two four quart pots in it at the most, but this thing can cook 40 loaves of bread at a time, probably six, eight trays of pizzas or croissants and so forth. This one, it's back in production with the third owner of the Sun Oven Company in Kansas, the couple there, they put it this way, they pestered the guy because they tried to just send them overseas using NGOs to get them into the countries that are most in need, but they got the brand new version of it there.

Nate Hagens (00:41:30):

I mean, there's so many different reasons this makes sense. There's the climate low carbon emission reason. There's the let's save our forests reason, there's the not heating our kitchen reason. There's the let's save money on future electricity and gas reason. There's the health of the food and the simplicity, and there's the DIY, I'm in control of cooking my own food without relying on these external things, but just focus on the climate reason. What would, I mean, are there any plans or such where NGOs and philanthropists and institutions from the global North might donate huge amounts of these ovens to people in Africa and India where they just have to start using them and maybe see the benefits and then word of mouth? Could something like that happen? Is something like that happening?

Luther Krueger (00:42:32):

Just about every manufacturer I know has tried, or they do have limited programs overseas in Africa, Asia, primarily Africa. It seems like they get a little bit more of an ear bent toward the cause by governments. Kenya in particular, they've been working with Solar Cookers International to work it into their national scheme to address climate change and pasteurizing water. I know one of the reasons I ratcheted up my involvement in promoting it was hearing about kids with river worms or bacterias in the nearest source of water, and if they live to be 10 years old, maybe they were blind or lame, and it's just a tragedy on a current level. This is before we're talking losing fossil fuels. Pretty much every manufacturer has done that. Solar Cookers International, they're the best source on their wiki, at solarcooking.org they have by country, which countries have been involved, which have tried things.

The Great Simplification

(00:43:36):

Some of them, when I check in, they say, "Well, that was 2014 and we just really haven't gained any traction," but some are really currently making tracks. I mentioned earlier, just to cap this off, Roger Haines, retired federal prosecutor, yet he designed this panel cooker that is amazing. He has been working with NGOs and the Rotaries. He's a rotary member. They've been involved in a lot of the solar cooking promotion overseas, and he has looked into carbon credits. He's stepped back from trying to use them, but he's sending them by the thousands overseas. It is happening, not to the level we'd like to see.

Nate Hagens (00:44:13):

Continuing with your little montage here, what about number 10?

Luther Krueger (00:44:16):

Number 10, that's the Fusion. Ghost Sun is a company based out of Cincinnati. I interviewed Patrick Sherwin back in 2021, vacuum tube cooker, but also a hybrid. It's got a tray. If you slide the tray out, you'll notice on the bottom it's got a heating element. If the sun goes down, clouds roll over, you just plug it into a battery, which they also include a little solar panel kit with it so you can keep cooking. Interestingly, it has higher temperatures with the solar than it does with the heating element for various reasons, the materials they'd have to choose, but it's a 24/7 cooker, a little pricey, maybe marketed a bit more toward the vacationing crowd, the campers, but it's an all-season 24/7 cooker.

Nate Hagens (00:45:04):

Okay, so we're at number 11, Luther. What are we looking at?

Luther Krueger (00:45:07):

Sure. This is Bing Gu who came up with about the only safe Fresnel lens solar cooker. If you've ever visited a lighthouse on a tour, that's that big honking glass thing, but it's striated, so it's still a lens, it's just compressed. Well, this is a big sheet of plastic, and they're in the back of most every rear projection TV. They're the front actually with the screen. A lot of people that get into this, they cannibalize them, but they can be very

The Great Simplification

dangerous. People melt rocks with the focal point with these from these rear projection TVs, 2,000 degrees or more sometimes in that very pinpoint focal point. Bing Gu has made a safe Fresnel lens cooker. It's the only one I'm aware of where you cannot burn your feet, set your furnace, I'm sorry, your fence or your house on fire 'cause it's all contained and it's very versatile. You can use pots to boil water or fry or bake four or five different attachments.

Nate Hagens (00:46:11):

2,000 degrees. Aren't people curious about the industrial application of that?

Luther Krueger (00:46:17):

Yes, although, that's 2,000 degrees at a focal point about that. Green Power Science in Florida, they make jewelry with it because they can use zinc and sand and do all sorts of creative things with it. That's a very small scale. I'm sure it's possible, but right now this is where it is at.

Nate Hagens (00:46:37):

Number 12.

Luther Krueger (00:46:39):

12, we have, this is the hybrid cooker I mentioned earlier, Steve Harrigan in Indiana, and a lot of these groups, they are faith-based, and this is part of his church mission where they have built these in Africa where people are totally off the grid. They have no other choice but to cook with food or with a contraption like this, which is solar, big barrel cooker, kind of like the Sun Oven Villager, only with a rocket stove attached. The heating flue goes through the cook box, so it heats the food when there's no sun. At the other end, the flue actually has another attachment where you can boil stuff as well. It actually can do two different meals, sets of meals with the hybrid attachment

Nate Hagens (00:47:20):

And 13.

Luther Krueger (00:47:23):

The Great Simplification

13, Solar Education Project, Mary Bechenek, Jennifer Gasser, they are really, I feel, they're one of the most involved leaders in the solar cooking movement. They put together a textbook on physics, which is totally based on solar cooking and how reflectivity counts, heat retention, the energy and light and so forth. In this particular interview I had with them, they actually took a carry-on and turned it into a solar box cooker with reflectors. It's just like your cooker only you can pack all your stuff to go on a trip and cook with it. Amazing.

Nate Hagens (00:48:01):

It's extremely low carbon except for the jet that you took.

Luther Krueger (00:48:05):

Yes. That's right.

Nate Hagens (00:48:07):

Yeah, and 14.

Luther Krueger (00:48:09):

14, Pat Brown, very involved with environmental causes in the Los Angeles area. She is actually pasteurizing food, discarded food to use for fodder, for cattle, for pets and so forth. Yet another application, and this is a DIY model where she just put together a box lined with bricks so that when the sun heats it up, it retains the heat throughout the day and it dries at a temperature where it doesn't scorch, but you can have food for animals or humans if you wanted to. I'm sure there's an application for that too.

Nate Hagens (00:48:46):

And 15,

Luther Krueger (00:48:48):

15, Carla Ramsdale, I like to highlight her work. She's at Appalachian State University and she has an incredible website, and I think it's more or less a blog called Know Watts Cooking, W-A-T-T-S, and she talks about the waste in the food industry. Favorite example, and I see it every time I go shopping, garlic. You see the jars of processed garlic, and then right below it or to the right is the shelf-stable garlic that

The Great Simplification

will last longer than your jar unless you refrigerate it and use more energy to keep it in a stable state. She explains all that with physics in her classes at Appalachian State University, but one of my favorite episodes, she has this fractured vacuum tube and she's able to demonstrate this is how it works, here's where the vacuum is, here's the heating part, and so forth. An incredible educator and one who is doing outreach on that level around the world.

Nate Hagens (00:49:49):

Next to last, 16.

Luther Krueger (00:49:51):

16 and 16 and 17 are tied together, and you'll be happy to know one of your viewers, Craig Berglund, Reno, Nevada. I featured him as the last episode in my first season to celebrate him doing just about everything you can do with solar energy, both thermal and photovoltaic. In this video, he is roasting coffee beans with a repurposed Bundt cake pan, a TV satellite dish just lined with mirrors from the craft shop. Then he used to work for the casino business in Reno, and this is a discarded one-armed Bandit motor, the thing that spit out your quarters when you won or kept them if you didn't win. With just little lawn ornament solar panels, that thing turns at just the right speed and the focal point is about a three inch circle, and so it's roasting the beans at just exactly the right rate. About an hour later, you have perfectly roasted beans, little longer if you like a dark roast.

Nate Hagens (00:50:58):

This is all ... Thank you for sharing all that.

Luther Krueger (00:50:59):

Sure.

Nate Hagens (00:51:00):

This is all what I would term appropriate technology, and it's cool and it checks a lot of the boxes for the future that you and I can envision coming. Do solar cookers and technologies like them inherently first require a mindset change about what

The Great Simplification

technologies is for and a larger change in our lifestyle to a slower, more conscious, more intentional, more living with the earth sort of pace?

Luther Krueger (00:51:34):

I believe so. I think that everyone's motivated for different reasons. For me, it was the environment, but then it was so damn much fun to cook in my own backyard, whatever I wanted. I knew I could cook just about anything. For some, it's really, they're the tinkerers. We're actually, we have a project we're working on where we're going to be reaching out to makerspaces around the world to do a maker challenge saying, "Hey, you come up with the next big deal solar cooker." These are the people that... One guest I recommend, he's a maker, Chris Hackett in New York City made a solar pasteurizer where he pasteurized water from the East River and it got picked up by Popular Science. He had a series and so forth. Great book, *The Big Book of Maker Skills*, and just the last point-

Nate Hagens (00:52:24):

Please introduce us.

Luther Krueger (00:52:26):

Yes. He coined the term obtainium. He said, "Don't ever buy new stuff to make anything. The most common element known to is obtainium." You can obtain stuff from rear projection TVs, junkyards. How many sofas do we have thrown in our alley here in Minneapolis? I learned welding because we have so many bed frames. Free stuff.

Nate Hagens (00:52:49):

Yeah, obtainium is going to be a big resource in coming decades, more than likely. What would it require? Oh, see, here's the issue. It's the same thing with government stimulus and stock markets at all-time highs. We're cognitively able to envision different trajectories in coming decades for our world, for our culture, for our communities. Emotionally, we're not because we get finished watching a podcast or a video and we have the conveniences of our home and a brown truck shows up and delivers vitamins or dog food or whatever it is. We don't have the emotional push to do something like this. What is it going to take to scale this stuff across our country or in Africa and India and other places? What do you think?

The Great Simplification

Luther Krueger (00:53:49):

I'm afraid there's probably four or five different avenues. One that might jar things loose is if we have some real tragedies, famines. I'm always surprised at how famines, which can be, it's a distribution problem. I remember reading this long ago, the food is here, you got to get it there, and it just doesn't get there. Well, the same for this particular tool for when they do have the food, but they have no way to safely cook it, get it to them. There are a lot of organizations that say, well, you got to charge a little bit so they have skin in the game. I think that works. They understand that, okay, they're investing in this thing and they don't just turn it into, take the reflectors and turn them into a mirror for their bathroom and so forth, which is a common story out there.

(00:54:34):

I often think if there are areas where they really need to do it, let's just do an airdrop of Roger Haines' cooker. You can send 5,000 of them on a pallet out the back of those C-130s or what have you, and just give them the instructions to say, "We've tried everything else. We've had 10 NGOs already tromp through your backyards and nothing's happening in the forest is further and further away."

Nate Hagens (00:54:57):

I think that's a great idea, and here's a North American version of that. Let's have a leader or a philanthropist or someone of means in every community, Red Wing, Minnesota, Topeka, Kansas, Salem, Oregon, get one of those community-level parabolics that you said for their community affiliated with a gathering place where people could come and meet each other and have solar cooked food just as a nucleus of some future intermediate Goldilocks technology that has social capital built in as an example. Because then people are like, "Oh, this cooked without any fossil hydrocarbons or anything? We were just using the sun?" I think it's that way. We need a foothold, which is why I found you, because Craig emailed me and I have a solar oven, and I think they're cool. Based on this conversation this weekend, I'm going to try to use it. Are you going to cook with your solar oven this weekend?

Luther Krueger (00:56:07):

The Great Simplification

If there's sun. Whenever there's sun, we try to put it out there, but we're doing more than that. I mean, I've actually learned you can bake green coffee beans and it makes a pretty good mild roast. You can roast your coffee beans in a parabolic. I've made dark roast, nearly espresso roasted.

Nate Hagens (00:56:23):

Do you and your family look at the 10 day forecast and say, "Oh, Tuesday through Thursday we're cooking outside. It's like full sun." Do you incorporate the forecast into your cooking plans?

Luther Krueger (00:56:36):

We do, but we can't go 10 days. This variety weather belt. Before I retired, we would have solar brunches on Saturdays, and it'd be Thursday. I couldn't look before Thursday, and it had to be sunny on Friday and Saturday because the weather pattern tends to move forward in time. If it was sunny both Friday and Saturday, I would call a brunch and almost never had any clouds at all, but I had to do it that 10 days out, it'll be exactly flip flop.

Nate Hagens (00:57:07):

That right there is one of the reasons fossil hydrocarbons have been indistinguishable from magic, because it doesn't matter what's happening outside. We flick a switch and we get the brain services, and that era is gradually or suddenly coming to an end, which is why I think more people need to be aware of this type of technology. Thank you for all that. Are there any other technologies like this, what I would call Goldilocks tech or intermediate tech that you're excited about and would like to at least highlight?

Luther Krueger (00:57:43):

Sure. Well, one of my side hustles is I've been teaching at Metro State and the Masters of Public and Nonprofit Administration Program. I've had some guest speakers who are doing incredible stuff with social enterprise companies and nonprofits. One of my favorites, it's called Lucky Iron Fish. What it was is a public health organization found that in Southeast Asia levels of anemia like skyrocketed from single digits to 80, 90% of the people going to a clinic visit had anemia. What

The Great Simplification

they found was people had switched from those big cast iron things that they cooked over wooden fires to aluminum. And it's an area where there's not a lot of natural iron in the diet was their determination. They went out to Southeast Asia and said, "Well, here, put this cube of cast iron," and it's a special mix.

(00:58:38):

They got all alloys, a little bit of lemon juice in there, and then for 10 minutes put it in there and then take it out, and then it would restore the iron. They did the work where they had people do that, found that very few people did it. It's the adoption thing, the cultural thing. When they surveyed people, why not one person said, "Well, what is it? It's a cube, it's a doorstop, it's a toy. It doesn't look like something we need to use." They changed it to the shape of a fish, which is considered good luck in the river deltas there, and the reason it's good luck is when you catch it's got a natural smile. It's like, thank you for catching me. I will bless your day, and adoption skyrocketed. We're talking a big cultural, I had to have them speak to my class because it's the right combination of studying and applying what you learned to fix a problem.

Nate Hagens (00:59:31):

Somewhere in there is a parable or a microcosm for our entire society and what we face. What would be the equivalent of that for the United States conspicuous consumption culture? I'm not so sure, but ...

Luther Krueger (00:59:45):

Sure.

Nate Hagens (00:59:45):

... Yeah. Awesome, so you follow my podcast. Let me ask you a few questions.

Luther Krueger (00:59:52):

Sure.

Nate Hagens (00:59:53):

The Great Simplification

What advice do you have for people that are aware of all this stuff and watch episodes that are a little bit of a downer about climate or the oceans or energy or politics or anything? What kind of advice do you have for people?

Luther Krueger (01:00:06):

Sure. Well, first I'd say I'm a natural optimist in spite of the Rachel Carson influence and all this stuff. When I was a kid, I did see the Cuyahoga River. We moved to Ohio in the early seventies and they had finally put out the Cuyahoga River fires. There has been progress, but it seems like it'd be three steps forward and two and a half steps back on that front. Now obviously, we've just got to figure out how to not use the fossil fuels, but also just start simple. Our backyard brunches, I did them before I decided to do my video trips. And it was so fulfilling to see families come and for the first time see an actual manufactured cooker, which bumped it up in their level of respect as something to use toward this end. Don't give up, just reach out to your neighbor. Community organizer that I was during my times with the police department, the expression other organizers had was "each one reach one." You don't have to reach the whole world today, just reach that one person who can make a difference tomorrow.

Nate Hagens (01:01:12):

How would you change that for young people? You said you're a professor at Metro State, and I'm sure you interact with young people on your travels. What sort of advice would you give to a young human coming across these big challenges we face?

Luther Krueger (01:01:30):

Sure. Well, I would say dive in at the deep end. You won't drown. Get familiar with the kind of cookers that are out there. Tell your friends. I've got two real quick youth stories. One is we had a couple that came to one of my brunches with their two daughters and kind of dragged them in, but the invitation said, bring something to cook. They each brought their one egg and we cooked them in the Sunplicity. Two weeks later, I called another brunch and instead of the parents heading the way and trying to drag the kids, the kids ran into the deck with their batches of cookie dough. All they need is to see it, see it and taste it when it's done. The second one is, I was invited last spring to speak to a technical college where they had fifth and sixth

The Great Simplification

graders who'd signed up for STEM for science, the science part of STEM, to hear about this kind of stuff.

(01:02:24):

75 of them in 25 bunches, three classes, pick solar cooking for an hour. At the last assignment for them was, here's a blank piece of paper, draw what you think a solar cooker should do. They were intent on it and they saw the Sunplicity, they saw the Sport, and two of them came up with things that I had never seen before. 20 years of collecting solar cookers and being able to tell them, "I got to share this with some people that make this stuff. Do you mind if I share your information?" They were fine with it. They're willing to learn if you don't beat it out of them. I mean, I've heard that expressed by teachers, by parents. Kids want to know. They want to learn. They want to be in on stuff and their heart's in the right place, again, until they get caught on that treadmill that we all end up on during a lot of our lives trying to make a living and so forth.

Nate Hagens (01:03:21):

Yeah, I hear you. At the core of this is we're trying to get brain services or human services with using less energy and less materials and less environmental damage. That's at the core, but there's obtainium, there's our creativity. I was thinking about making a video that on the same burner, in the same size pan on my stove, there are choices of food preferences. If you fry an egg or you scramble an egg and you do them at the same time, the scrambled eggs are done in like 30 seconds and the fried eggs take like three minutes. That whole time, where I live, you're using more propane. Aligned with all the solar oven options you presented to me is this change in mindset of wants and needs with respect to food. I think there's a lot of things that are possible that we haven't even considered.

Luther Krueger (01:04:18):

Absolutely. In fact, if I may talk about heat retention cookers or what your grandmother called the hay box or hay basket, my grandmother in Grand Forks, North Dakota would leave there to Cooperstown, two-hour drive with her stew wrapped in blankets in their trunk and drove to Cooperstown, and five hours later we're eating supper. They get there about noon, it's still steaming hot blankets around

The Great Simplification

the thing. Mr. De Decker would have something to say about that. Insulate the body. Don't heat all the air in your house if you can help it. Anyway, I mentioned that because that's the one little kind of footnote to all of these cookers is one cooker can cook 10, 12 meals if you do the other simple technology, which is insulation from wool, from cotton, from rags, so yeah.

Nate Hagens (01:05:15):

It may sound like a non sequitur given everything else on this conversation, but what do you care most about in the world, Luther?

Luther Krueger (01:05:23):

Well, I've got to say I've been married 37 years and some people have asked, "How do you get by with this guy who just runs off and does these month long trips?" She said, "I just let him go forth," and so family, family first, if you don't think of your family first, it's kind of hard to extend that to society or just say the ills that everyone else is suffering. Well, since my family isn't suffering them or if I can't take care of them, how am I going to take care of the rest of the world? That's first and foremost.

(01:06:01):

Also, a lot of the organizations that have been promoting solar cooking, one in particular, Solar Oven Partners, they're a project of the United Methodist Church. They're all faith-based. A lot of them are faith-based. Not all of them, but there's an element of faith to this that people do have to have that you can just show people, here's what you need and hope that they take care of it. Move on to the next one, just act in faith and that maybe we won't hit that brink where the lemming ahead of us grabs us by the scruff and brings us over the cliff with them. That's not the right way to put it, but it's just the thought I have. If all else fails, well, we're all in this together.

Nate Hagens (01:06:51):

You created magic there because I've never visualized a lemming grabbing another lemming by the scruff and I had that image in my head, so nice work. Luther, if you could wave a magic wand and there was no recourse to you or your family, what is one thing that you would do to change planetary human society futures?

The Great Simplification

Luther Krueger (01:07:14):

Well, I'm deep into the solar cooking part. If I could get a solar cooker of any way, shape, or form into every household, I don't understand enough about the rest of the problems, but I get it. I see a lot of memes about, "Oh, this is how they saved a whale. This is how they saved a flock," or oh, I remember one story is in the New Yorker, a woman very devout Catholic, finally cornered, not the Pope necessarily, but Vatican City and said, "Where are all of our properties? Because we're losing the pollinating areas for bees." They dug into the maps going back to fourth century, being able to document where they had properties. She said, "Could we just say these are pollinating places? Get the churches to put pollinators there." Everyone's going to find their little niche where they can take care of a little tiny fragment of this worldwide problem.

(01:08:11):

She's making tracks with that. Very inspiring story. Again, faith-based and it doesn't have to be Catholic faith. Deepak Gadya in India with his ashrams. When I talked to him, one of the faith-based projects that came his way was people said, "We traditionally burn pyres of people here when they die. Could we do that with solar?" He said, "Well, I know we can, but talk to your religious leaders first because I don't want to set one up and all of a sudden I'm running a foul." They consulted and found that yes you can. It's burning. It's a little trickier because even the current process doesn't burn perfectly, but it will do the job. Being able to reach out to this one little segment of the population where they're concerned about that they're using too much wood for these funeral pyres. You don't think about it.

Nate Hagens (01:09:06):

My concern always with renewables hasn't been do they work? And hasn't been can we use them to meet basic needs? My concern has been we are trying to tell a story of continuing the way we live with 19 terawatt and growing metabolism impacting nature. That's not what I think we can and should use solar and other technology for. Thank you for forging ahead and educating people about other uses that are more practical and use far less energy and materials using the free energy of the sun. Do you have any closing comments for our viewers, Luther?

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Luther Krueger (01:09:51):

No, thank you so much for having me. I'm trying to reach out to as many outlets where I can get the word and just, solarcooking.org, inspirational story here. A guy who was a Microsoft programmer, Tom Sponheim, in the eighties said, "We need an archive with all this stuff. We need one place to go." You try to Google solar cooking and you get every crazy, workable, but it just doesn't inspire, but you got one place where you can get at it. He set up an archive and later converted it to a Wiki. That is the one source. Don't listen to me, go to the Wiki, go to Solarcooking.org. Watch my series. I'm not monetizing it. I don't intend to. Those are the experts. They're the ones that really know what they're doing, but the Wiki is really, I tell everyone, go there first. DIY, commercial vendors are on there, the histories that will inspire you. Take that to the bank, so to speak. Social Capital Bank.

Nate Hagens (01:10:49):

Thank you so much, Luther, for your insights today and for your passion on this. It shines through and I personally think it's important. Maybe you come back for a round table on DIY Goldilocks Tech.

Luther Krueger (01:11:04):

Absolutely. Happy to.

Nate Hagens (01:11:07):

Thank you.

Luther Krueger (01:11:08):

Thank you.

Speaker 3 (01:11:10):

If you enjoyed or learned from this episode of the Great Simplification, please follow us on your favorite podcast platform and visit thegreatsimplification.com for more information on future releases. This show is hosted by Nate Hagens, edited by No Troublemakers Media, and curated by Leslie Batt-lutz and Lizzy Sirianni.