

When Mother Nature Says, 'I'm Out,' Geoengineering Hacks Will Fix Our Planet: Thomas Kostigen with Dave Asprey– #777

Announcer: Bulletproof Radio, a state of high performance.

Dave Asprey:

You're listening to Bulletproof Radio with Dave Asprey. Today, we're going to have a fascinating conversation about hacking the planet. And as a former computer hacker, and someone who started thinking when I was about 12 like, why don't we make the weather the way we want it to be? What are we going to do to fix even back then what we know some things aren't working the way we want? How are we going to fix that? And how are we going to do it in a way that's nondestructive given that there's a lot of ground to make up? This is an interview for you, if you're interested in that kind of stuff.

We will go deep in geoengineering, protecting the planet, not just reshaping it into what we want it to be, but actually making it work the way it's supposed to work. And we're going to go really deep on that with a guy who I would call a futurist. He's a journalist who's traveled from war zones to the world's wonders. And a guy who writes the Climate Survivalist column for USA Today, and a major contributor to publications worldwide. His most recent book is called Hacking Planet Earth. His name is Thomas Kostigen. Thomas, welcome to the show.

Thomas Kostigen:

Thanks for having me, Dave.

Dave:

You've done so much crazy stuff like Extreme Weather Survival Guide. And all things from conservation to things that are kind of a shit show environmentally, what are we going to do about it? I'd like to start by asking you straight up, how bad is it? Our environment, the state of the planet right now?

Thomas:

Well, if we want to look at Northern California as an example, that's a big one, with the wildfires raging, now moving into the Midwest, one of the most active hurricane seasons that we've seen, major droughts, incredible storms every single winter, major precipitation, as well as sea level rise. That's just a few things. So it's bad. And it's no laughing matter. People are really in dire straits. You overlay that with a pandemic, and we really need to get our act together. And that's why I've become so passionate about it. But it does bring up this sense of it's almost laughable that we haven't done enough, because you look at what's going on and you think, what more is it going to take for us to actually do something?

Dave:

In your book, you say, fate cannot be left to chance any longer, which is actually kind of funny. It's like saying it's not too late to panic. And that fate is ideally chance. You're advocating, and you're probably one of the biggest voices advocating saying, all right, we know the direction things are headed. It's time to pull out really, really big engineering solutions to this in a way that maybe Peter Diamandis would support, who's been on the show a few times.

Peter has talked, in fact, he's advocated for an XPRIZE around putting up a space umbrella. I'm one of the backers of the Carbon XPRIZE, the Carbon Capture XPRIZE. And what do you think about the space umbrella idea, talk about what it is and what you think. Should we really do that?

Thomas:

Well, the space umbrella, I get right up front in the book, because I wanted to show people what the farthest out type of thinking is. And the space umbrella for people who don't know it is, there's several different iterations of it, where you would literally launch reflective materials, nanoparticles into space that would create a space shade or space umbrella, whatever, what have you that would deflect the sun's radiation and therefore cool the planet.

xperson would go, wow, that's a way out there and very expensive, and it is several trillion dollars. And we'd have to, in some way, probably colonize the moon in order to create manufacturing facilities out there to launch the space umbrella from there otherwise, launching it from Earth would be very, very difficult and expensive and would take a very long period of time.

Dave:

You could also probably create a huge amount of atmospheric pollution sending all those rockets into space, right?

Thomas:

Yeah. I mean, it's just out there. So far out there on the theoretical like, let's go back to college and think about some stuff that's way out there and then model it. That's what I think the scientists do on that. So for me, that's not a reasonable alternative right now. But I do put it out there as an nth degree, and then work the way back to say, here's some shit that we can do right here right now, that doesn't involve colonizing the moon, that doesn't involve trillions of dollars, and doesn't of course, set off a lot of carbon emissions by sending rockets into outer space.

Dave:

Okay, so you're not a fan of the space shield there, and you're talking about one that's relatively far out from the planet because there's one plan that says we should put something closer to the sun so you can block out more of the sun and one that says you have nanoparticles kind of closer in, you looked at both of those. And you're saying that they're both expensive and far out there and not worth the trouble basically?

Thomas:

Well, it's very difficult when you start to look at... You have to go to Lagrange point, which is kind of those place that doesn't move between the Earth and the Sun. So if you didn't do that, then you're talking about a satellite that you would then have to control and you start getting into some weird Gerard Butler like action movie things that I think is just a little far out there, when we could be doing some things, look cool roofs, cool roads, right?

You could do right here in your community today. We could start to get into some of the other things like marine cloud brightening that will start to lower things with clouds or SCoPEX, which I'm sure you know about, which is David Keith at Harvard University has been toying with the idea and to set up a committee to spray certain types of aerosols into the tops of clouds that will reflect [inaudible 00:06:32]. And so I think there's some things that we could do here on planet earth first, before we start getting into outer space as a kind of a last resort, in my mind.

Dave:

All right. This is going to make half the audience think I'm a nut, and the other half is going to say, I can't believe Dave knows about that. There's a group of people who've been putting photos and I've seen photos, hell I've seen in myself of unmarked airplanes with large streams behind them. People call them chemtrails. And they've been saying for years, this is part of weather modification. I have no actual stake in the game. I don't know. What's going on with that?

Thomas:

Yeah, that's tinfoil hat. So-

Dave:

Man, I was hoping you're going to say, of course, it's backed by Bill Gates, and it's powered by 5G, and the Illuminati are behind it all. And I was going to get real excited. I do feel like I'm seeing a lot of stuff in the sky that I haven't seen before. But other than that, I can't tell you who's doing what or why. You didn't that's just increased air traffic, and there's nothing else going on?

Thomas:

... That's a different show, Dave.

Dave:

No, I don't have any direct knowledge of anything going on there. But I do know, increased airplane traffic is changing the warming of the planet, at least I've read somethings about that.

Thomas:

Oh, of course, so is shipping, and so are emissions of any scope. But when you start to think is there a deliberate plan by the military industrial complex in order to shift the weather so that we'll have different migration patterns, so that we'll eat certain types of food, you start to go down a very strange rabbit hole, of non-rigorous-

Dave:

The environment is not rational.

Thomas:

... No, no, no. So my book, just to be clear, is based in rigorous science and all the methodologies that are in it are backed by serious science who have certain solutions that I just think the word hasn't gotten out, that people can get their brain around and go, that's reasonable. Geoengineering is controversial by its very nature, by certain segments, not only of the environmental movement but others. And then, for me, we have to shift the conversation from what's far out there to what's reasonable, and what can we do in the here and the now.

Dave:

Give me a couple other really big far out things. So we talked about the space umbrella, which I just like because it's just as science fiction as you can get, and I'm kind of a geek, but I understand the difficulties of that one. So, that's one. Give me two more of the craziest ones that are out there that you think are at least at some point in the future possible. And then let's go into some closer end stuff we can do?

Thomas:

Well, some of the things that we could do that are possible, I mean, I can get into some more crazy shit if you want to get into like setting off nuclear bombs in space in order to move the earth type of thing.

Dave:

Let's not quite go there. That is technically possible, but it's just too messy.

Thomas:

Yeah, yeah. So I think Stratospheric Aerosol Injection is probably the most radical form of geoengineering that's here today, only because it made it by the scientists backing it and these are some of the leading climate scientists in the world. That people will die because of it. That it will have some pass along effect, a ripple effect, if you will, whereby if we allow it to be cooler in one place on the planet, it will get hotter in another, and the ramifications of that could spark if it's done at an exponential degree. An Amazon wildfire like we've never seen before, which, of course would have pass along effects. So things like that.

So Stratospheric Aerosol injection, I think is a big, big one that is out there, but reasonable, and probably is going to happen at a small degree. And I also think that we are going to have some type of ocean engineering, ocean fertilization, in order to reinvigorate the dying seas that we're seeing today. We have just a lot of dead zones, depleting fish stock, those types of things, and in order to shift that, we're going to have to start to mess with our oceans. And that's a very controversial piece, but I think it's going to be necessary.

Dave:

Well, the truth is that we already have massively messed with the oceans, and that we've dumped stupid amounts of oil in them via spills all over the place. There's tons of plastic, there's tons of pollution, there's increasing acidification and all that. So the idea that it's controversial that we mess with it, I guess the big question is, are you saying we mess with it to put it back the way it was working? Or are you saying we just kind of take it over, and now it's a managed real estate, and we're going to landscape it the way we want it? Is this a return to nature, or is this a landscaping project you're talking about?

Thomas:

There is no return to nature. The days of Little House on the Prairie are done. And we've had this and this is kind of a pet peeve of mine movement, of trying to bring things back to the way things work. And there is no going back there. We're on a certain trajectory of progress. It doesn't have to be bad, it doesn't have to be pejorative, we can have reasonable, positive, managed oceans, land, atmosphere. We've already messed with the land, we've already messed with the oceans as you've said, and we've already messed with the atmosphere. And Mother Nature said, you know what? I'm out. She's like, I don't know what you guys are doing. But I can't handle this in terms of carbon capture, or in terms of other means in the ocean, or in the atmosphere, or on land anymore. So you guys have to figure it out.

So we truly do have to become stewards of the planet, and we truly do have to mind what we do in a positive way. So not recklessly. So for listeners out there thinking that I'm just saying, let's just go at stuff. I'm not saying that at all. I'm saying we have virtual modeling that we've never had before in the history of humankind, that can show us, and you as an engineer know this, what things are going to be based on myriad possibilities, way into the future with supercomputers? So why aren't we using that

type of modeling today? And then putting it to our best minds to say, how can we keep things from getting worse, when it comes to the climate?

Dave:

Being stewards of the planet is a good idea. And some people are saying that the planet should be steward of itself. We have changed the planet in such a way a lot of people don't know that the entire East Coast was full of big forests, that all died when we brought a virus in. And that forest all away. And there's something like 1% of the old growth forest left on the West Coast. And there's logging companies looking to cut that down right now.

So that stuff would take 1000s, if not 10s of 1000s of years to recover naturally. And it probably won't, given that there isn't enough water anymore, and the heat is up and all those sorts of things. So if we were to become stewards of the planet, Thomas, take us 100 years from now, what would the planet look like if we enacted the things that you've discovered in your book?

Thomas:

Well, I end the book this way, so it leads toward a city of the future. We look at cities as something that we've kind of fled from most recently, but we will eventually go back to that type of communal living because we don't have much of a choice. Population growth, of course, is the big missing element that we haven't discussed here going forward. And the centers of population are going to change dramatically to Northern Africa, to the MENA, Middle East North Africa, cities, as Africa and the developing world starts to industrialize and become more a part of world trade, et cetera. We're going to see centers of population grow more and more there and into Asia.

So I look at a place that Norman Foster who is a frigging genius architect, put together just outside of Abu Dhabi in a place called Masdar City. And that is intentionally going to be the city of the future. There's another one called Neom being built in Saudi Arabia. And basically, it's off grid with a lot of efficiencies built into what people do on a daily basis, how they do it, and being smart about how we go about our daily lives, but not ignoring the past, and that's really important.

So you'll have artificial cars, you'll probably have flying cars, we're going to have buildings that are closer together in order to keep a little bit of shading within cities themselves, less dark surfaces, more light surfaces, completely off the grid powered by solar and wind, and then we'll have our food sources much closer to our cities. So we're not importing food that's 1500 to 1700 miles away in order to get on our dinner plate and seeing 50% of the food wasted along the way.

So I think we're going to have a completely different idea of what food is. By then, that will probably be much more genetically modified. And I know that's a scary proposition for people, but that's the way it's going to feed the population by then. And we're going to have a lot more efficiencies, and that's really important built into our everyday life. So we'll be tagged, and we'll be able to get on our bicycles and be able to pedal away and not have to worry about red lights, because the lights will turn green, we'll be able to-

Dave:

You said, we'll be tagged, what does that mean?

Thomas:

... Yeah, so I think there's going to be a lot more smart tagging on our phones, or even body technology, that we'll wear wearable technology that I'm sure you've heard about. So we'll have things like that, that

are able to monitor what we're doing health-wise, monitor what we're doing for the climate, and show us the best ways to go about our life to be more efficient, and take into account all those variables.

I mean, I look at how many steps I take a day now, just by looking at my phone, which I know is, maybe a little bit even old school and analog at this point. But it gives me a sense of, am I doing the right thing, can I do better? And we're going to have a lot more of those milestones, I think baked into what we do, largely put in place by, the commercial sector. And I believe that the private sector has to have an incentive for us to do the right thing, and that will give us more an incentive to do the right thing in order for the world to get to a better place.

So we can't rely on government, hasn't worked, don't even sign on to the Kyoto Protocol, can't rely on activism 50 years since the first Earth Day, and we're still doing the definition of insanity.

Dave:

Complaining doesn't work.

Thomas:

It's literally the definition of insanity, doing the same thing over and over again and expecting a different result, and that's what we've been doing. And I know, but she has a great, great, audience and I think what she does is wonderful.

Dave:

I'm with you there. We're raising awareness, but at this point, we're all aware that the environment isn't working very well, and kind of standing up and saying, something should be done, no one's doing anything, and I'm very angry. It's like, well. The figuring out what to do is the hard part for me, and that's why I like your book. All right. Let's go out and let's take positive charge of the evolution of the planet instead of taking negative charge. But when you say private sector, it's really odd, because Google started out as the best replacement for a library ever, and now they're facing antitrust charges. And in order to find a relevant result, it's 650 pixels down the screen.

It was 300 pixels down the screen when they started out, because they're injecting a motive that isn't about me getting the best library services, the best search results, it's about, of them selling more, which is what private companies do. And I'm trying to figure out, even if you look at things like railroads, electrical utilities, oil and gas and mining, timber, commercial fishing, none of them have ever done anything good as a steward of the planet. Not that they weren't providing useful stuff. We're both using enormous resources from those things right now just to communicate, but how would private sector people actually positively manage the environment?

Thomas:

Well, all those things you just mentioned weren't putting climate and the environment at the center of their ethos. So if you make that your mission statement, then the commercial aspect of what you're doing becomes somewhat incidental to your long term mission. And we're starting to see that not only be embraced, but also celebrated. And in some cases mandated and encouraged by the financial markets. And when you start to have systematic approaches by institutional investors saying, if you don't have an environmental, social and corporate governance plan in place, you ain't getting our money.

Now, all of a sudden, companies who haven't been living that way start to go, we got to change our way of thinking. And then to me, it's almost like the person who starts to recycle for the first time,

they go, oh, now I get it. And now I think we're starting to see the business community start to get it, and start to go for different things like carbon neutrality, or starting to look at their supply chain transparency, and we're starting to get more sophisticated in the language that we use to put out different reports. So it's an evolution. And I think if you put that at the center of what people need to do, and what businesses need to accomplish, then the private sector methodology of saying, okay, that incentive is rewarded in the market. And once we have a reward system in the market, that's what's going to change things. Right now we have a penalty system in the marketplace. We need to flip that around, and have a reward system in the marketplace. And that's what the private sector does.

Dave:

All right, I love that perspective. If there is an incentive, the system will automatically self-govern in that direction. But if the incentive is not there, it'll go in whatever the direction is, and it's not that there's an evil overlord saying, muahahaha, we're going to go do this. It's just, 100,000 people making micro-decisions every minute to optimize a system for an outcome, you get some pretty nasty, emerging behaviors that are bad for the environment, so. Okay. Do you get worked up over the pandemic? You look at the four plus trillion dollars the US spent on the pandemic, and our response for something that is potentially dangerous, compared to if we'd have put that \$4 trillion towards hacking the planet, what do you think about that?

Thomas:

Well, I don't think it's either, or. I mean, obviously, we have something that landed at our doorstep that we had no idea would come about. Some people could make the claim that, sure, because of increased, and these are stories out there, deforestation, allowing people to go further and further into forests, we're going to be exposed to things like bats with weird diseases, things like that. So there is that correlation there. But when we look at what happens to us, of course, you're going to have to take care of your fever first, before you can start to take care of your long term health, right? And the same thing with the planet. But it's a wakeup call.

It doesn't piss me off, as much as it really invigorates me to say, we need to do more, and here's an example why. And it also showcases the complexity of the challenge in front of us. Because we have a public health crisis, where if you go outside without a mask on and get exposed, you're going to frigging die, or you have the potential to die. And people still say, no, I'm not going to wear a mask. No, I'm going to flout all these restrictions and these guidelines. So imagine what the challenge is for climate change, when you say, okay, somewhere in the far future, or not too distant future now. But in the future, things are going to happen, and your life is going to change for the worse. And you start to impress upon people these things that isn't happening right here, and right now, different decision making comes into place.

So you have to I think, look at this as an opportunity to say, the tragedy struck could be multiplied in the climate side of things when we look at this, and will exacerbate our public health crises in the future. So I think, clearly we have to deal with what's in front of us today, but we also have to look at it as a learning mechanism for tomorrow. So I think people are starting to look that way. I think people are starting to think about wow, what else should we be worried about? Worry is now a tangible thing. It's not happenstance so much anymore. People realize, oh, this thing science, what people say. I mean, the large majority of us who are reasonable people think, now we should pay attention to what those scientists say. So hopefully, this will embolden us to rely on science even more when it comes to the climate crisis.

Dave:

It seems like there's some closer parallels. We can motivate people across the planet to radically change their lifestyle, at least for short periods of time, with the threat of death, even if it's a 1% threat of death like that. But in your book, you're saying a billion people are going to become climate refugees by 2050, if we don't do something, and that's only 30 years. How long does it take to make a difference in the environment, even if we were to deploy some of the big solutions you're proposing right now? Is 30 years even long enough to turn the ship?

Thomas:

Well, if we started to enact some of the technology solutions today, we would have a fighting chance, because the hard truth is that we have to reduce our carbon emission budget by 45% by the year 2030. And that's a stretched out kind of horizon, taking a 2050 model and then baking that back to say this is how much we have to reduce our carbon emissions by within a decade. Are we going to be able to do that to keep global temperature rise from exceeding 1.5, or 2.7 degrees Fahrenheit by then? No, there's just no way it's going to happen.

We've had an excessive carbon budget and carbon emission budget for the last X number of years, even last year, despite everything was still seeing excess emissions. And now when things go back to full capacity, what are we going to see the world look like them? Are we going to ignore some of these points that you made of being able to change your lifestyle very dramatically, and very quickly by staying in? Or are we going to go back to the same old ways? And unless we put something in front of people to change that direction, people are going to go back to the same old ways. And so things like artificial trees, or carbon capture mechanisms that can suck emissions out of the atmosphere, or paying more attention to soil with precision agriculture, or a lot of these other technologies, unless we start to put those in front of people as real propositions, we're going to go back to the same old thing of thinking, if we bring a canvas bag to the grocery store, we're doing the right thing, and everything's cool. It's not cool.

Dave:

It seems like artificial trees, and a lot of the climate engineering things in your book require an enormous amount of manufacturer, supply chain, plastic, precious metals, palladium, or whatever else is in there. Have you done the math? I mean, are we actually going to come out ahead by the time we manufacture gazillions of wind turbines and solar reflectors in the desert and all the other things like that?

Thomas:

It depends how we manufacture it. So we have to think into that. So if we look at things like terrestrial land mining, for example, it takes I think, an area the size of Central Park to create one battery for an electronic vehicle, right? And you have to mine an area the size of New York and Connecticut in order to get that, so you're saying-

Dave:

I know you burn coal to charge your electric car in the US.

Thomas:

... Yeah. I mean, we have to think like, okay, great. Now we're all in electric vehicles, but how are we making them to your point? And what are they being powered by, by another point? So we have an opportunity now to go back more than 100 years. We have an opportunity to look at this as the next energy revolution. When they started the Industrial Revolution, they didn't really think about emissions, they weren't really thinking ahead. We have that opportunity now. And we are thinking about the tail end of things. We are thinking about emissions, but we're not thinking so much about the front end manufacturing of things. And that's the irony here. And so we have to start to flip that equation.

So things like deep sea mining, for example, very little of any solid waste, you have 90% different, less of an environmental footprint. But you have to get people to buy into that and allow the convention of the seeds in order to go down and get nodules that you may or may not know have like four different types of metals that we can just go and pick up rocks without a lot of these concerns, and the area where they are, could be used to manufacture a billion electronic vehicles. So we just have to think about what we're doing, how we're doing it, and what the result of those actions are. And so it really does need a step back and a big approach, and technology needs to be certainly embraced. But we need to, again, back to your point, think about everything that goes into it. Otherwise, we're going to have the equation remain the same just flipped and the answer unfortunately, maybe even worse.

Dave:

What do you think about Elon Musk?

Thomas:

In terms of, is he a good guy? Would I have a drink? Or he's-

Dave:

Or whether he's cute? Sorry, I just had to go there. The network of things, or the system of things that he's building? He's got SolarCity that's now part of Tesla. He's got Tesla, the biggest electric cars, all that kind of stuff. Is this moving the climate in the right direction?

Thomas:

... You're baiting me on this one, aren't you? I think it's a wonderful ethic and thought process that goes into, how can we make the planet a better place at surface level, right? There's a lot of things that go into building a Tesla, like the batteries that, obviously, you can argue, a hummer has less of an environmental footprint for certain period of time than a Tesla, right? So have has that all been thought in? No. But someone has to put a stake in the ground. And I absolutely commend him, and salute him for what he's done, given the capabilities that he's had to deal with today. And so, are we going to get to that point, where we're going to be able to recycle batteries, we're going to be recycled that metal?

I have trust in a visionary like that. And I totally have a great deal of respect for a visionary like that, who says, let's do this now, and then we'll start to get into some of the other things. It's kind of like this stimulus package. Can't we get money to people who are standing in food lines today, and then worry about all the other, pork that you want to put into it for a bill in Congress? That's why government needs to get out of the way in a way here. And we'll be able to have people with the right ideas, and the right incentives come in and say, well, let's recycle that. Let's do things a different way. Let's try and, mitigate that risk that we now are aware of.

So I completely commend him and celebrate him for saying, I'm going to do this right now. And you know what? That obstacle does not apply to me, and that way of thinking does not apply to me. If

that was the case, then he'd probably still be sitting there with his blueprints, thinking how am I going to do this? So action to me speaks volumes, words, less and less the older I get.

Dave:

And directionally, if you're going there, you can course correct. But if you say I'm not going to go because I'm not sure I'm going exactly the right way, so well head north, and you can tighten in a little bit, or whichever direction you want to go. So I'm with you on that, where there's awesome stuff going on there, and there's a lot of stuff that he probably would do if he wasn't dealing with various policies and procedures and all the other stuff that you have to deal with when you're running a larger company. Do you have kids?

Thomas:

No.

Dave:

Would you have kids now knowing the world they'd be born into?

Thomas:

I've been thinking more and more that I think adopting is probably the right thing to do in today's day and age, just because of this situation that we're in. We have a lot of people in need, increasingly so, especially kids, and for no fault of their own, they're born into this world, into an environment that we've created for them that is increasingly hostile. So to give those children a chance, I think is the right thing to do.

If I decided to have a child, it would be a tough decision. Just because of all the things that fortunately, or unfortunately have infected my brain since I've been in this space for the last 20 years, and know the problems that we have with not only the environment but with our food supply, and with a lot of other things that are going to face the next generation. And, I think we should have a little bit more of an onus on us and think about that and be thoughtful about that, because I think that's what we're laying off on people.

We're laying off on kids. If you think about it, it is our debt, we're just saying, hey, we're just going to be this drunken sailor and go buy all this shit. And then sorry, son, you're going to have to pay for it. It's basically the same mentality. So, to be a responsible human being, I think is a whole nother set of the environmental movement to think, what can I do better so that I'm not laying off that debt on the next generation of my kids?

I have 17 nieces and nephews, I have eight brothers and sisters. There's a lot of my family out there, and I look at all of them and say, wow, some of them believe in what I do, some of them don't believe in what I do. And how do you navigate that, even amongst your immediate family? So how do you then bring that type of mentality to the next generation? I think it's a tough thing. So it's a good question, tough question, and I've never been asked that before. So, thank you.

Dave:

You're welcome. And what I got out of that was, you're not particularly hopeful about the future?

Thomas:

Well, I don't think that being hopeful is necessarily linked to procreation. Yeah, I think that we can look at it differently, and think that, is that my best use of me? Is that the best use of me? So I don't know the answer to that. But I think we're in for a challenge, and I think we're in for a fight. I am hopeful, given the things that I've been exposed to, and traveling around the world a number of times now and seeing people and places and things, and the most far off, messed up place that you can imagine, who are exactly like you and me.

We all think we're really special. We all think that we think differently, and that we go about our life differently, but I can promise you, if you go deep into the jungles of the Amazon, or deep into the rain forests in Asia, where I've been, and you sit down around a fire with people don't even speak your language, who don't wear any of the same clothing that you do, you realize, none of this shit matters.

And they're getting up and waking up and looking for food, and gossiping, and talking and trying to figure it out, just like you. And when you get that human connection, you start to realize, okay, we are all in this together, and we are all looking to do the right thing, for the most part. I mean, you do have the norms. But for the most part, we're all looking to do the right thing, and we'll do something to help our fellow human being, I truly believe that. And that's why I think we just need to put in front of people, the right thing to do. And to me, that's technology today.

Dave:

What do you think about the notion that electromagnetic frequencies from electronics affect our biology as well as the planet?

Thomas:

The 5G question?

Dave:

No, no. Not just 5G, even our electrical system, alternating current going back since we first started having alternating current? Just we know. In fact, I have \$50,000 pulsy electromagnetic frequency devices I can use to change bone density in my body. So there's a whole set of EMFs, not the 5G, is a good or bad question at all, but just is increasing the amount of EMF on the planet, something that you're considering in your work?

Thomas:

A lot. [inaudible 00:38:34] equipment. Look, it's a problem if you just look at the bird problem, right? I mean, so that's one. And now if you get really freaky and start to look at migrations of fish, what's happening with migrations of fish? So, yeah, it does have an effect. It hasn't been explored enough for me to render a scientific type of answer to that. Am I concerned about it? 100%. Because you could see those little results that we've just decided to focus on, never mind some of the other types of effects that we should be focusing on. And you said, bone density.

So public health, for example. Okay, when you start to look at ionic type of programs, and the analog version of this is going to a waterfall or to a beach or deep in the forest, and seeing how that affects you heuristically, and it does affect your mood change. So, if nature can do that through her system of electronics, which is what ions essentially are, then you can look at what we're doing to this. And of course, that's going to make a change. How? I think that we're starting to see birth rates and, certain other things that have been affected by electronics. But nothing that empirically, I've seen that we can actually point to. There's a lot of noise and again, even noise.

I mean, if you've seen any of this stuff, like when the earth gets quiet, it's fascinating from above and what that vibration does, because-

Dave:

Oh, just the physical vibrations affect us. Yeah, that's a good point.

Thomas:

... Huge. Yeah, I mean, so when the pandemic came, they did a study of the noise in the planet, and how it went down and what that did. And it's really interesting to affect people's moods, to affect how people dream, to affect wildlife, there's all sorts of things that we can tap into that we haven't looked at, and I don't think we have maybe even the capacity to think about it this way yet. Because we can't see like a bee sees, we can't hear like a bird hears or bat hears. We have a different sense, and I think we need to do a lot more work in both biomimicry and the results of technology to understand what the effect is on the planet, and on the biomass system itself. So that's a whole nother school of thought that I think needs a lot of work, and should be looked into.

Dave:

The notion of fairness is one that's really hard to think your way through. Because clearly, we don't have a lot of control over what part of the world we're born in, right? So that in and of itself is inherently unfair. And these billion climate refugees we're talking about, they didn't choose that, it happened, right? Or it is going to happen as the case may be. And it's inherently unfair. So even if we are as helpful as we can be, we're as charitable as we can be, we're kind of solving the problems as fast as we can, it's still going to be not evenly distributed in any world that I can see like that.

So we can all work towards fairness, knowing full well that pretty much life isn't ever going to be fair. And I don't know how to work through that mentally. Because right now, you and I, and everyone listening to the show could immediately sell everything, donate everything and go live in a part of the world of no electricity, right? But it still would be unfair, right?

Thomas:

Yeah.

Dave:

Do you have any thoughts on that? As a part of hacking the planet, are we going to increase overall fairness to humans to equal access to resources and things like that? Or is this a human nature problem?

Thomas:

No, no, it's a market problem.

Dave:

It's a market problem. Okay.

Thomas:

And when we start to see, I'll tell you a story that you probably heard before. The turn of the century, 19th century, two shoe companies send their top shoe salesman to a developing world country. One of the shoe salesmen comes back and says to his boss, no market there. Nobody there is wearing shoes,

right? The other salesman comes back and says, oh, my God, what an opportunity. Nobody there is wearing shoes. And I think that's the same thing we have to look at here is where is the market opportunity for us, and let's sell those proverbial shoes responsibly? And if we can start to bring that level of the world economy up, then people are going to start to pay attention to that. And we're already seeing the prongs of that, and we have seen the problems of that since the Sustainable Development Goals were initiated. Some of those goals and milestones have been reached. And so that's a very aspirational way of us looking at markets and saying, those can solve problems.

Are they going to do it the most efficiently, in the most ethical way possible to begin with? No. But will we start to again, to go back to Elon Musk, put a stake in the ground and say, now, can we do better? Yes. So I think that's where we start to have to go in my mind at least, in order to attract best in class technologies, innovations and possibilities for people.

Dave:

Okay, that makes sense. It's a long term problem, like everything here. And I got to say, I'm a futurist. I see a lot of opportunities. It almost feels like we're kind of screwed. On a degree from, say, one being not screwed at all, and 100 being completely screwed, no matter what we do. Where are we?

Thomas:

We're at the 50 mark.

Dave:

We're only at 50. I kind of like we're at 70. And I'm a hopeful, I think I share the view of Peter Diamandis, this is actually the most exciting time ever to be alive. We have the ability to make change with technology that you couldn't do no matter who you were 50 or 100 or 500 years ago, but it still seems like there's a lot of work to be done here. All right, on a scale of one to 100. How hopeful are you? 100 is, yeah, we got this, and one is okay, and 50 is how screwed we are. But how hopeful are you that we're going to unscrew ourselves? I suppose that's the question.

Thomas:

I would say I'm about 70% hopeful because-

Dave:

70% hopeful. All right. That's good.

Thomas:

... Yeah, because I believe in the human spirit. Well, get that, the other 30% are political factors, other factors and externalities that we can't control.

Dave:

How are we going to stop the glaciers from melting?

Thomas:

I went underneath a glacier in Northern Norway, in the Arctic Circle. And they are experimenting with all sorts of really interesting smart stuff like stanchions that will not only support the glaciers, but slow the melt. Because when you have glacial melt, what it does is it starts to scrape away the surface really fast,

and expose more darker material. So you have more melt, more quickly. So if you can slow that melt, it gives things time to keep frozen. And so that's a really interesting technology. I salute the scientists who are working on that today.

So, there's some possibilities for putting those not only in Greenland, which is Northern Hemisphere's biggest glacier, but also in Antarctica. And then, there's a report in The Guardian today about, building or placing 10 million snowblowers. I don't know, if you read this in the Arctic, to blow the snow.

Dave:

Wow. That seems a little crazy.

Thomas:

A little nuts. But there are things that like Ice911 is doing, which is creating artificial pellets that have the same reflectivity of snow.

Dave:

Out of glass.

Thomas:

Yeah, and covering different parts of glaciers that are melting with that. So it will create a higher albedo effect, as opposed to when you start to expose land, obviously, has a lower albedo, holds more energy, and so on, and so forth. So there are some possibilities, real possibilities for that. My favorite is the ice stupas, just because they're like saying ice stupas.

Dave:

I was hoping you were going to go there. I was going to bring it up if you didn't talk about those. Those are awesome.

Thomas:

Yeah, so this is the Himalaya, and the guy won the Rolex Entrepreneur Award, who created it. And essentially, it's a very simple design, if you take a pipe, and you put it in the ground, and it's sprays the water from the melt up into the air, and creates almost like this igloo effect, because the water freezes.

Dave:

At night.

Thomas:

At night. And then farther into the season, what's been happening. So they're seeing, melt earlier, and earlier in the year, when you have an agricultural system that's built on, say, May or June or July type of harvests and things, you can then start to move your irrigation farther and farther into the summer. And then, the higher altitudes there. So it's a really cool way of doing it.

So in other words, when that frozen hut stays there, and you start to get farther and farther into the season, and then, it gets warmer, it starts to melt in a more regular interval. So it allows a better chance for irrigation, and therefore, the crops get irrigated, and you're able to feed off those crops and

provide more food for the communities, and it's just a really cool thing based on a pipe that a guy stuck into the ground and said, oh, look, what we could do here. Really smart.

Dave:

It's those elegant solutions that aren't expensive, sometimes are world changing. If you think about how much it costs to put a proper cement storage water capture system in place, you can't do it in the vast majority of the world. I mean, it's \$100,000 for not more than 100,000 gallons of water which isn't that much for agricultural use. But if instead you're able to say, I had these four pipes that were taking pressure fed runoff basically throwing it up in the sky and building giant frozen water storage instead of liquid ones, you could just radically changed the productivity of the land. And right now this is saving entire villages that otherwise would have no water now because their glaciers gone.

So I'm super happy about that. And I feel like a lot of the low hanging fruit for hacking the planet is actually decentralization. What that is, that's decentralizing the glacier. And we can decentralize so many other things like food production, like soil production, and having more clusters of things closer to market. And all that seems like it reduces risk and probably spreads pollution as well as spreads regeneration around a broader area. And I'm pretty hopeful that that's the direction we had, versus these monolithic, one company controls all growth of all farms and things like that. I think, we're going to have decentralization or more centralization as we go forward.

Thomas:

I think you nailed it, and I celebrate that. And one of my favorite technologies in the book, so I'm glad we get to talk a little bit about that is zero mass water, creating water from air.

Dave:

Yeah, talk about that.

Thomas:

Which is a decentralized system, where it's a device that looks like a solar panel, except it's a hydro panel. And you can place it and it takes basically sunlight, and air and just very simplistically, it squeezes the water out of that, and provides water to communities who are off the grid, who are off the system, who have no way of accessing water, this puts it, as you eloquently put it, in their front yard. So now all of a sudden, you have a community who can benefit from this, and they could start to obviously grow things and then start to prosper more and more. They do it with fog catchers in the Atacama Desert. And they look like volleyball nets, but they hoist these big nets up into the air, and they capture the fog in the morning, and that creates water for the entire village. And they even create beer out of it, believe it or not.

Dave:

That's so cool.

Thomas:

It's really cool. So things like that, I think are super helpful, and they're smart. And so the book, when I talk about technology, it's a broad sense of technology. I think of tunneling as technology, it's innovation. How can we reduce friction? And how can we get the resources that people need to them in the most efficient way possible. And sometimes that doesn't mean creating a transportation system, like

we've done just to make life easy, and call Uber Eats, it's really about how can we put the resources literally in front of us so that we have the energy that we need for our home, so that we have a garden in our backyard that we can irrigate, from water that we captured from air. And now all of a sudden, this is creating a very equal system, which is a whole nother futuristic thing.

Now that we're on the same level, now that I have the same access, now that there's nothing between me and a healthier life with the same chance as you, now what? So that changes the dynamics a lot in the world economy today. So that's where I'm really hopeful things are going to go because now all of a sudden, we do all have the same shot at prospering, whatever that means to you.

Dave:

What are the top three things that you'd recommend people do right now in order to make the world or the environment a much better place, 30 years from now?

Thomas:

Yeah, I think, looking at your energy source that we talked about, is there anything you can do there. Looking at the structure, and people don't think about this, can you create a cooler environment for yourself? Paint your roof, or your road, white, or lighter, or look into cool roof, cool road, that type of technology, because it's really simple, and it does create a benefit there. And then, food, water and waste is basically everything comes back to those three things.

So you got to look at water, What's your water footprint? And by that, I mean, what are you doing in terms of where you're sourcing your food? Take a look at your diet. And how is that impacting the planet? And then, in terms of technology, it really is, how can I start to look at ways to help and get behind this movement? Are there companies that I like? Is there a way that I can engage from an advocacy standpoint behind some of these technologies? What can we do in our homes besides solar?

Water has a huge energy impact, so that's why I keep coming back to water. Takes 30% of the energy in California alone to move water around the state. So getting a lower water footprint has a direct impact on energy, which of course then has a pass along effect on carbon emissions. And then your food, what are you going to do about that? So just kind of taking a holistic standpoint of what you're doing, and then trying to understand, could technology make my life a little bit more efficient?

We haven't looked at something that I think speaks to exactly what we're talking about in a microcosm. And that is, this phone. This mobile phone didn't have any of the things that are baked into it today, 10 years ago, but it's changed our lives enormously. And I think we can look at the same proposition for the climate in a very small way. Things that we didn't think were possible are possible. But we have to get behind some of the leaders who are doing it. And we have to just be smart about the way we go through our life to be more efficient, because that's what it's all about. At the end of the day, it's about efficiency.

Dave:

Being more efficient. I wanted to end on that note, but I've got to ask you a personal question. I'm working on a home that I'm remodeling that's here in Victoria, a little bit closer to a population center which is nice and keeping my farm, of course. And I interviewed a guy named Ian Mitchell recently on the show, who's got a new kind of concrete, and it absorbs CO2 from the air, instead of putting it out. The concrete's responsible for what? 10, 11% of our global carbon emissions and concrete's really bad.

So this fixes that problem, and it also saves sand because believe it or not, we're running out of sand with the way we're building right now. So I'm thinking about doing it, but it comes out this

beautiful black color. So if I have black concrete that absorbs heat, but also absorbs CO2, how the heck do you do math to know if that was the right thing to do?

Thomas:

Well, concrete, as you probably know, is the second most consumed material on the planet now besides water. So we have to do something about that. How about painting that concrete white?

Dave:

I'm thinking I might be able to do that as long as it doesn't inhibit its ability to absorb carbon, it also lets water in through it, which is a nice thing. So it doesn't create extra runoff. But it's those kinds of equations where you're saying, look, there's always a trade-off. And right now, we often don't have the math to know the best trade-off. But at least if everyone listening can think about it and say, okay, pros and cons, did I stack more pros than more cons? In that mindset, you can do for what you eat, whether it's environmental, or whether it's how it's going to affect you nutritionally.

It doesn't have to be perfect, just have more good than bad. And I think we can all change our thinking right now, to say, look, perfection is not required, because perfectionism leads to hopelessness and inaction, but just do it a little bit better. And it's that tilt, that will over the course of 30 and 50, and over 100 years as that enters our mindset, I think that's what's going to change things. And that will inevitably lead to people taking some of the larger technology you're talking about here, because demand will rise for those.

When hundreds of millions of people do just a slight change, what happens at the outcome of that complex system is much bigger changes. That's why I'm betting on, and that's why you're sharing information like you have in your book, *Hacking the Planet*, is really important, and that's I think it's a worthy read.

Now, you're the only author I know, who doesn't have a website, is that because of the carbon footprint of websites or something, or? They do have a carbon footprint, by the way, especially streaming media, that's a horrible thing, we didn't even go there. But where do people find you?

Thomas:

You can find me on any social media platform, or you can go on, to buy my books at any of the places that you buy, clearly. And, yeah, I've decided to just keep things... I produce so much content in other platforms in other ways that I'm usually out there enough. But it's pretty, pretty easy to Google me, and figure out where you can find me.

Dave:

Thomas, T-H-O-M-A-S, because people spelled Thomas like 15 different ways. And your last name is Kostigen, K-O-S-T-I-G-E-N. And of course, you guys know, there's going to be a full transcript, there'll be show notes, and all of this is on daveasprey.com, as it always is. For every one of the shows, you can just go there and click the links to find your social. And you're active on LinkedIn, and Twitter and Instagram and all that kind of stuff, [tkostigen](https://www.instagram.com/tkostigen) on Instagram.

Thomas:

Yep.

Dave:

All right, Thomas, thank you for thinking really far into the future and looking at stuff that most people wouldn't think about, and tackling one of the biggest, most complex vexing problems that's out there. I don't think your book tells us here's exactly how it's going to be. But you're painting enough possibilities that people should walk away from this interview hopeful rather than hopeless, and that's the goal. Thank you.

Thomas:

Thanks for having me, and I hope there's hope in the air.