Welcome to *Entanglements*, the new podcast from the Jesus College Intellectual Forum. I'm so excited for you to join me, Noah, as we unpack and explore the human-nature relationship.

In the previous episode, I met with Dr Gladys Kalema-Zikusoka to discuss the One Health approach to conservation, which proposes that we treat human and animal health in a holistic way. However, as is evident by the multiple ecological crises that we are facing, our society has often acted as if it is independent of the natural world and its ecosystems. And because of this, society has tended to become untethered from acting in a sustainable and responsible way.

To explore this, I spoke to Kate Raworth, author of *Doughnut Economics* and founder of the Doughnut Economics Action Lab, which works to put her doughnut theory into practice by working with everyone from communities and teachers to businesses and local governments. I started by asking her what she means when she describes herself as a renegade economist.

Kate Raworth: I say that because I studied economics at university 30 years ago and was really frustrated by the theories I was taught. I think they failed to equip us to tackle the challenges of the world today. So I left economics. I walked away, never wanted to call myself an economist and yet have found myself coming back towards it but wanting to flip it on its head and start economics with the fundamentals that we value: human life, human rights, and the living world and conditions conducive to life. And say, if we put human rights and ecological integrity at the centre of our vision, what kind of economics will we construct then? So that's my passion.

Noah Rouse: I first asked Kate to explain just what the doughnut is, and how it turns economics on its head and challenges mainstream economic view.

Kate: So mainstream economics as it's taught doesn't tend to ask what is the goal, because I think that was seen as a subjective or normative view and economics wanted to position itself as somehow an objective or positive science, which I think is a fundamental impossibility and mistake. We have to specify the goal we're aiming for. Otherwise, how on earth can we know whether a policy, whether an economy is succeeding? Mainstream economics starts with the market. It's the first diagram almost every economic student I've ever encountered. We say, what's the first diagram? You remember learning and they say, oh, supply and demand. So it puts the market at the center of our vision. Welcome to economics, which in ancient Greek means the art of household management.

Let's ask, which household? Today, it has to surely be the planetary household, the living world. And how will we manage it? In whose interests do we steward this household? Humanities or living beings or subset of humanity? So we need to ask ourselves, what do we mean by economics? And we start still in mainstream economics with supply and demand. Here's the market. We put that at the center of our vision and it focuses us on price, that becomes the metric by which economics is done. And it focuses us on things that are

exchanged through markets. And anything that falls outside of the price contract is called an externality. And when I was studying economics 30 years ago at university, that's where the living world showed up. Oh, it's an environmental externality. Pollution, acid rain, climate change, the ozone hole, yeah, that's an environmental externality because it's not taken into account in the contract when two people are buying and selling things.

Noah: Of course someone might ask, what's the problem with this?

Kate: And I really think if aliens wanted to take down humanity they would not need to arrive here with lasers, they could simply convince us to talk about the living world on which all life depends as an environmental externality. Job done, you know. I mean, in what way are we ever going to recognize, respect, protect, and restore the living world if in economics we are calling it an externality? By definition, it's externalizing it, it's making it peripheral, it's an add-on, it's at the sidelines of our view. It has to be central.

So that's partly why I walked away from economics. The day I started walking back towards it, and I remember it really vividly, I had just returned to my job at Oxfam. I'd returned from maternity leave. I've got twins, so I'd spent a year immersed in the care economy of tiny babies, which is, let me tell you, intensive. So all unpaid, all invisible in GDP.

I had just come back to my job. I was at my desk and a colleague showed me a deck of slides of big ideas that have happened in the last year. This is in 2010. And bang, on my screen is this circle with red lines radiating out from the center. And it was called the Diagram of Planetary Boundaries. Earth system scientists, way outside of economics, these are Earth system scientists, ocean specialists, climate specialists, water, nutrient flow, hydrologists, they'd come together and they said, what is it about the Holocene epoch of life on Earth, the last 10 to 12,000 years, that has been so remarkably stable in terms of the temperature of life on Earth, but also benevolent to human civilizations? All human civilizations have risen up, flourished, survived, thrived in this era. What is it about the last 10 to 12,000 years? It's called the Holocene, and they said its stability that's been so benevolent to humanity depends upon a set of life-supporting systems that make life work with this stability on Earth. And they identified nine, including the climate cycle, the carbon cycle, the water cycle, nutrient flow, the health of ecosystems, quality of the air, oceans. And they said these are the nine planetary boundaries beyond which we should not put so much pressure on Earth's life-supporting systems that we risk kicking them out of balance. So we shouldn't put so many greenhouse gases in the atmosphere that we actually cause climate breakdown. We shouldn't remove so much water from lakes and rivers that we actually dry them up and disrupt the hydrological flow. We shouldn't put so much fertilizer into soils that it leaches out into lakes and rivers and causes eutrophication and kills off life.

So the nine planetary boundaries, and they drew them in a circle, showing this is the limit of pressure we should be putting on the living world. And we are already over that limit on multiple ones of these, on climate change, on biodiversity loss, on fertilizer use. So it was this diagram of a circle with these big red lines radiating out from the center. And as I stared

at it, number one, I'd never studied Earth system science, but for the first time I could understand this. It was expressed in a way that we can get.

And number two, I saw there, this is the limits of the human economy. This is what ecological economists who have always drawn a circle around the economy and said the economy should always be recognized to be a subsystem of the biosphere, but they never were able to quantify it. Along comes the scientists and they quantified it. And it was, I had just this adrenaline rush moment. I really felt the adrenaline of seeing this image and I thought, that's it. This is the beginning of 21st century economics because they have quantified it. They've specified these are the planetary boundaries. This is the limit. We believe this is the boundary limit beyond which we shouldn't go. And look, we're actually already way over those limits. So we need to come back within this space.

And that means that the economy has to be a subsystem of not only society, but the living world. And it has to be compatible with coming back within the space, it puts restrictions on the economy. This is not about externalities. This centers the living world and says the economy is a subsystem of that, and must be transformed to be compatible with the conditions conducive to staying within planetary boundaries.

So I see that and I thought, this is the beginning of 21st century economics. Here I am sitting and working in Oxfam where we work on human rights, on social justice, on ensuring health and education for all, a decent income for all. So if there's an outer limit beyond which resources you shouldn't go, isn't there also an inner limit for each person? We each need sufficient food and water and income and a roof over our heads and clothing to be able to meet our human rights. So just as there's one circle on the outside, I drew a circle within a circle and it looked like a doughnut. As somebody pointed out, one of the scientists said to me, oh, it's not a circle, it's a doughnut. That's the diagram we've been missing. So that's where the doughnut came from.

And if you think of it, it's a goal that says leave no one in the hole of the doughnuts, falling short on the essentials of life, make sure everybody has the resources they need to meet their human rights, to lead a life of dignity and opportunity and community, but at the same time make sure that we collectively don't overshoot the outer circle, because that's where we cause the breakdown of our life-supporting systems on which all of our well-being depends. So human well-being depends upon both of those circles. And to me that becomes the starting point for economics. Okay, that's a goal, meet the needs of all people within the means of the living planet.

And then this incredible question comes, if that's the goal, what kind of economy would get us there? How would you want us to learn about who we are? Not the competitive, self-interested, rational economic man, but humanity embedded in the web of life. So this began for me the journey of becoming a renegade economist. And I read all the economics I'd never been taught, beginning with ecological economics and feminist economics, complexity economics, institutional economics, and realized there was a wealth of ideas there. So I drew on them and put them together so they could dance on the same page. And I ended up

calling it *Doughnut Economics*. A playful name, but many people are afraid of economics, but no one's afraid of doughnuts. So it tells everybody this is playful, this is accessible. It invites everybody into the conversation.

Noah: I know when I first saw the diagrams and read the book, it felt intuitive in a way that—the way I had experienced that up to that point felt undynamic.

And I think it's really interesting where you talk about recognition that we're part of the web of life. So I think we're in this incredibly privileged position to be among the first generations to know the true extent of the impact we've had upon the world and the first generations to be faced with, okay, it's up to us to do something and to change the way we think and the way we act to sustain the world.

But we're not the first generations to recognize that we're embedded in the web of nature. We think about economics as coming from the households, but of course, the garden is also part of the household. In the book, you talk really effectively about the cuckoo goal of growth. Do you think there's particular points at which we lost sight that we are embedded within the web of life and that crucially the economy is embedded? Do you think it's a gradual process that we've lost sight of our relationship to the world around us and our economy's relationship to the world around us, or were there particular turning points in the recent 150 years or longer?

Kate: Great question. So first of all, let's recognise that we're talking about the Western economic mindset. And I think of D*oughnut Economics* as something like a Western mindset recovery programme. Starting with the mindset that we've inherited, how can we find our way back towards something much more holistic, which is of course, deeply embedded in many indigenous cultures thinking. The starting point is recognizing embeddedness in the web of life. What else could you possibly imagine, they might say. Well, Western mindsets manage to imagine something very, very different.

So, yeah, back in the time of Adam Smith, he and fellow economists would have recognized, let's say, if they were trying to create economic equations or reduce it to factors of production, as you might call it, they would have recognized land, labor, and capital. Right, so labor being the work done by those paid a wage, and this is all still market relations. Capital being the ownership of finance or financial assets like factories and machinery or intellectual property. And then land symbolizing not just land, but all Earth's resources and living systems. Now that got collapsed over time into today, much more likely to encounter labor and capital. And they said, well, land is a form of capital, right? It becomes a form of capital. There's a massive collapsing going on there because it's falsely, I think, reducing the complexity of living systems, which have their own dynamic, their own laws, the laws of nature, the laws of thermodynamics and the flow of the way life works on a regenerative pattern. Life grows, growth is a wonderful healthy phase of life, but then things grow, they grow up, they mature, they live and then they die and then they are regenerated by nature. So it's a circle, a regenerative cycle. To lump that in and say, well, that's just another form of capital, we're going to put in the same box as what we've called capital, which is dominated

by the design of finance. The finance is designed with the expectation of endless accumulation.

It's a completely different pattern. In fact, you couldn't ask for two patterns more diametrically opposed, but they've been clumped together in one box named capital. What happens is actually land just disappears, the notion of it. So the living world and its own dynamics and its own requirements and its own boundaries and constraints and generosities and abundances, it's all disappeared and we don't learn about it.

And I think one of the reasons may be because, for example, David Ricardo began thinking that the availability of land was going to be the constraining factor upon economic development, but then when you get empires opening up, when you get colonialism and extraction of resources from around the world through trade, through power, then suddenly, oh, land doesn't seem to be so limited after all. We are extracting globally, and so the limits seem to have disappeared temporarily, and the mindset develops around the idea that actually those limits are negligible. And so it embeds a deeply extractive and exploitative resource mentality, as well as a deep power mentality of other cultures.

Noah: So I asked, how did Kate respond to this?

Kate: So, okay, where's the biggest diagram of the economy that's taught? Like if you said, you know, you started me here with supply and demand of market, that's starting at the level of market interaction, but let's pull out, show me the biggest picture of the economy you have. And this is what I often would challenge an economics professor to say, show me the biggest picture you have, what's visible and what's not visible. And the biggest picture that's usually shown and taught in macroeconomics is called the circular flow of income and goods. And it's a diagram that has the household and the business at the center. It's got labor and capital flowing around, right? Households provide labor and their capital, their finances or their resources. In return, they get wages and they get profit and they get goods and services that they can buy for that.

The living world is just invisible here. In fact, this diagram looks like it's a circular diagram and it's called the circular flow. And it looks like things just go round and round. It's drawn as if it's a perpetual motion machine. There's no input of, let me say, matter, the living materials from the world. There's no outflow of waste and pollutants. There's no recognition above that, that actually everything is created and fueled and charged by energy from the sun. Energy, so energy and matter are just missing. And the dynamics of that, as Georgescu-Rogan, who was one of the founding fathers of ecological economics, would say, you know, the fundamental flow of the economy is not round and round, as they tell us that's where money's going. The fundamental flow of the economy is a one-way street. It's the laws of thermodynamics. It's the quality of energy that comes in, high quality energy initially coming in from the sun, and due to the laws of entropy, goes out as waste heat that can't be used.

This isn't taught in economics and yet actually energy and the laws of how energy works, this is fundamental to the world in which we live. This is fundamental to this universe and definitely to life on this planet. And if we don't understand that, how can we actually ever hope to manage or steward our household? Satish Kumar, who's a new economic thinker, he would always say, you know, before you ever want to be an economist, a manager of the household, you need to be an ecologist and understand the household. He once went to the London School of Economics and was showing around and he said, where's the ecology department? How can you have the study of economics if you don't understand the living world? And it's a really sound point.

So the fundamental diagrams are missing us, living materials and matter, it's missing the streams of pollutants that we put out, it's missing recognition that this has to be bounded if we're going to protect the living systems on which we depend, and it's missing the thermodynamics of energy coming from the sun. These are really, really big things to be missing. And no wonder we find ourselves facing the environmental externalities today of climate breakdown, ecological breakdown, because if you miss something that matters, if you miss something fundamental in your model, they're going to come back and slap you big time if you failed to pay them attention.

Noah: One thing that Kate's work makes very clear is the extent to which we're just missing out on the wider picture. But economists also tend to ignore the immense value of what's been called the core or the care economy, namely unpaid and often unrecognised work, work which is fundamental not only to the economy but indeed the entirety of society. I asked Kate how the excessive focus on monetary growth has devalued how we see the core economy, the work of families, of communities and ultimately the importance of connection, not only with those around us but with the natural world itself.

Kate: Yeah, so I decided to redraw the circular flow diagram, or rather I decided to draw a new big picture of the economy. If I was teaching economics to people who've never studied it before, what would be the biggest picture of the economy I would show them? And I drew a diagram that I call the embedded economy diagram, drawing on ecological economics and feminist economics and commons theory. So drawing on the insights of many, many others, and I was trying to put them together in one picture. So it's three concentric circles. It's the economy, it's a subsystem of society, it is a social construct, right? Our economies are inventions of human relations and design and the good news there is we can reinvent them. And human society itself, of course, is embedded in the living world and a subsystem of it and we therefore need to learn for our societies and our economies to be compatible with the conditions conducive to life so that we can thrive on this planet. So economy in society in the living world that's the 101 move of ecological economics but also within the economy. Mainstream economics I'm talking about like what's taught at A-level and even in universities, it starts with the market and then it says well sometimes markets might not be the first-best solution, so let's look at the state and you get this focus on the market and the state.

And this turns into a very 20th century ideological boxing match. Are you for the free market, let's say for capitalism, or are you a state loving socialist? Or somewhere in between and what kind of mixed economy do you want? The focus on the market and the state focuses on value created that actually shows up in GDP. It shows up in monetary exchange, it's paid for, whether it's exchanged in market or service provided by or purchased by the state. So that focuses on what gets measured in national income and what gets counted. It's the monetary value of goods and services produced in the year. What it's completely missing is two other fundamental ways in which we provision for our essential needs and wants, not just through market exchange or through state provision, but one, through the household, where we begin every day, interestingly, unless we're students or others, right? The students at a particular moment in life, when you're learning about the economy, students are often plucked from the household and they're living in accommodation. So it's actually a much more market-based relationship and they're not experiencing, oh yes, all that unpaid care of the parent or the younger siblings or for the elders, but the unpaid care work that goes on, some call it the core economy or the care economy, it's the cooking, washing, cleaning, sweeping, the raising the kids, doing it all again tomorrow. That's what gets labour fresh and ready for work every day, to show up in the market or in the state relation. So it totally underpins it and subsidises it, but it's unpaid and therefore it's unrecognised. And therefore if it's unrecognised, it's likely to get squeezed or exploited or overworked if policy isn't focused on caring and respecting its role.

So we've got the market and the state, we've got the household, but then also there's the commons, which is the work of Elinor Ostrom. She made this really visible. The commons are where people come together, not through markets or through the state, but as a community to co-produce goods and services that they value. It might be Wikipedia, right? People are contributing to editing Wikipedia and creating something of remarkable value to many.

It might be a vegetable garden on the corner of your neighborhood block. So money often doesn't change hands, but people are creating things that they really value. Again, unpaid and therefore invisible in GDP or national income. So when we recognize that our well-being depends upon meeting our needs and wants through all of these four forms, the household and the commons, as well as the market and the state, that's a much more balanced way of looking at what we're trying to pursue, of what it means to generate value. There's a balance between them, and it's not going to show up in monetary terms, all of it, by any means.

It also recognising that that pursuit of value has to exist within the constraints of the living world. Otherwise, we start to run down the very foundations of our wellbeing. So this is a much more holistic form of pursuing well-being and pursuing a successful economy. And you're not going to be maximizing any one thing here, because there's no one number that's going to do justice to balancing the whole.

Now, if you ignore the fact that the economy is a subsystem of the living world, and if you ignore, as economists did for centuries, generations, ignore the household, because the

founding fathers of economics were fathers, and they didn't really notice the unpaid care economy. They left it out of their theories. If you ignore the commons, then you end up with the market and the state, and this is measured in monetary output. And so it's much easier to say, ah, a successful economy will be one that's maximizing and continually growing the monetary value of the goods and services it produces. What's not to like? We're producing more goods and services. People want to buy them. They are valued. What's not to like? Well, if you're ignoring all the other constraints around it, then yeah, you can too easily end up chasing growth and thinking that that's going to be a good enough proxy for human and planetary well-being.

And it is not. And it's very clear, I believe, in our times and our generation that the gap between chasing economic growth and thriving and the health of the planet and indeed the health of communities has massively come apart.

Noah: One of the things that just as you're speaking now I found really interesting is when we think about how we're embedded in nature and how you talk about emulating fractals of nature in the book, which I think is really powerful. I find it quite interesting that that core economy does emulate those fractals. You can only clean the house to a certain extent and then it will cycle away, it goes dirty. You can only raise your kids to a certain extent. I think it's really interesting how we've lost sight of that.

But how do we combat that? What sort of communications, what sort of interactions with both ourselves and with the natural world, where do you think that ignition, the spark, thinking in a more holistic and nature-based way comes from?

Kate: So let me say I think there are two parallel but very different projects going on at the moment to bring Western economic thought back into relation with the living world. And I'm going to start by a wonderful quote from the 20th century philosopher Hannah Arendt. She said a stray dog has a much greater chance of surviving if it's given a name. And if we say okay, Western economic thought has treated the living world as if it were a stray dog, it only showed up in economics as an environmental externality. So, how do we name it? How then do we do justice to this? Starting from where we are, building out from the mindsets that we find ourselves embedded in.

So there's two projects I think that are happening. One says, let's name it explicitly and make it visible in the frames that we have. So we'll talk about ecosystem services and the value. Did you know the value of ecosystem services? That bee pollination is worth billions a year in the economy. The value of clean water in this river is worth millions to this community. The value of trees in the city. A tree is worth a million pounds. It produces a million pounds worth of ecosystem services in terms of the cooling and the nature and the air quality, for example. So we can represent values of, let me say, the environment. I don't use that word, but let me sit with that word from a value of environment through giving it financial value.

But let me go back one step. I often say to people, tell me how you talk about the living world and I'll tell you what your job is, right? If you say, oh, I talk about the environment in terms of valuing ecosystem services and the value of natural capital. Then I'll say, I bet your job is policymaker facing. You are trying to persuade today's power holders, the Ministry of Finance, the Ministry of Industry, they're trying to persuade them that they should recognize the value of nature. And if you put it in their language and speak it in their language, and then you can add it to their balance sheets, and you can add it into their costings, and they will at last take account of it. And you may be right. Today's power holders may indeed, that may be the best way to get them to notice it. The danger of course is that you're then in the process framing all of life in economic valuation in the same way that original economists sort of gradually subsumed land under capital. You are saying, well, natural capital, yes, yes, it's a particular kind of capital, but we can treat it as capital. We can give it a financial value as well and then it becomes fungible. Can it be exchanged? If I've got more financial capital, am I willing to actually accumulate more financial capital because it's worth more than that natural capital you were talking about. So there's a real danger that it seems to be tradable with other forms of capital. So you might be winning today's battle to get the Ministry of Finance interested and paying attention, but you are handing over the whole of the living world to today's economic language.

If I say, tell me how you speak about the living world and I'll tell you what your job is, if someone says, well, I never use the word environment and I've actually, I don't use the word environment because I think about it, in French it means environ, it means surroundings. Your environment is your surroundings. Well, right now my environment is a room with walls and books. There's nothing alive about the word environment, it's not living.

So if someone says, I always speak of the living world, so they'll invoke life, make sure that my language is framed around life and living systems. And I want to make visible that humanity is embedded in the web of life. I want to make visible the complexity of ecosystems and the importance of human design, no longer degenerating them, but regenerating them. And then I say, OK, you're here for the long view. You're here for deep transformation. And you know that your words don't land easily in the ears of today's politicians and business leaders because it just doesn't fit with what they're already doing. But you're here for a deeper, bigger, longer transformation.

So when we go back to Hannah Arendt, you know, how are you going to name the stray dog? Are you going to call the stray dog natural capital? Or are you going to call the stray dog life-supporting systems? Are you going to talk about planetary boundaries? Are you going to talk about the web of life or natural resources? These are really big choices.

I personally speak of the living world. I personally go for the longer transformation. That's why I wrote a book whose subtitle was “Seven Ways to Think Like a 21st-century Economist”, I'm not trying to fix this week, this month, or the next three years, because if we only look at the adjacent possible, we'll really come up with things that seem feasible and doable and possible for politicians today and will be at real risk of being incremental. Let's go for a leap. And of course, the language that we then adopt, talking about the living world,

talking about the web of life, we're moving much closer to framing that is deeply known in Indigenous world views. So it's a Western mindset learning from and moving towards what's already held there.

Noah: I think it's really interesting what you're saying there and that inherent conflict in, okay, how we recognize the importance of the world. I'm thinking, I forget what the occasion was, but the Secretary of State was recently giving a talk where she said, businesses have only just realized the cost of climate change, which felt a bit late to be saying that. But it seems like the growth and clean up mindset, which you highlight and then deconstruct in the book, it just isn't sustainable and it isn't going to work. However, there are economies and there are power structures and there are important figures who seem to be taking on doughnut ideas and the wider ideas of support. How big a shift do you think it's going to take for our current society, "Western society", to shift into this view? Who should we follow? What are the examples, if we can be humble enough to admit that we're not the best?

Kate: Oh, big questions. So I drew the doughnut as a global concept, all of the world's population and the whole planet. But some researchers, Dan O'Neill, Andrew Fanning and others at Leeds University, downscaled it to, they created over 150 national doughnuts. And we can compare one in, say, Malawi, with a massive human shortfall without overshooting their share of any planetary boundaries. At the other end, the US, Canada, Australia, almost meeting the needs of all people with extraordinary levels of ecological overshoot and by the way of course huge levels of inequality within those nations. Across all of these countries, the country that's closest to meeting people's needs almost within the means of the living world is Costa Rica on around 22,000 dollars per person per year, so a third of the US and Canada and without actually directly trying to do it. So every country in the world needs to transform. There's no country that currently could say, we're meeting the needs of all our people within our share of the living planet.

We need transformation everywhere. I wrote *Doughnut Economics* and it came out in 2017. And what blew me away was actually the number of city councillors or town councillors or district councillors or state government, local government or subnational government staff and politicians who got in touch and said, well, what would it look like to do this here? And so we created a set of tools that we call Doughnut Unrolled, where we invite every place to ask itself this question, how can our locality, our city, town, neighborhood, district, how can this place become a home to thriving people in a thriving place, a locally ecologically thriving place, while respecting the well-being of all people and the health of the whole planet? So it's a very big holistic question that calls on places that say we're not here to maximize our GDP. There are over 70 local governments that, till today, have been in touch with us and said we want to use these tools. In some way we're adapting. So it shows that it's not just one or two places. There's a lot of people who've gone into government in localities around the world and said we want to actually start putting this into practice where we are. So the dougnut provides them with a holistic framework.

For example, the vice mayor of sustainability in Amsterdam said, look, we know we need to create more housing. There are more people coming to this city, but if we produce more housing in the way we've always done it, we're just doubly blowing our carbon budget. We can't keep doing things the way we've always done things. And it's made people be really creative. I think boundaries unleash our creativity. And when you see there's a social boundary and an ecological boundary, we're just going to have to do things differently. So they started saying, can we create more social housing? Can we create circular housing? Can we rebuild using existing materials so that we're actually having a far lower footprint in the world? And I think we're just at the beginning of this journey. I mean in the Netherlands recently, the European Commission really forced the country to realize that they are massively overusing nitrogen in fertilizers and in animal feed, so they need to come back within their ceiling of used nitrogen. It kicked up a massive conversation in the Netherlands about the nitrogen ceiling. And this for me was the first time I'd heard a country talking not just about our carbon budget and our carbon requirements, but now nitrogen.

This is going to happen more and more. And it can create very polarized politics in the country where we've left it very, very late. And suddenly these barriers or these limits become very real and we need to comply with them, which is all the more reminder to us to act much earlier than we have done because the later you leave it, the more drastic the action, the more drastic the action, the more likely it is to create rifts and inequities.

Noah: Fascinating. And it's inspiring to see with the research for this podcast and wider reading, I think one of the things which really came across to me, including after reading your book, is just the importance of local community. And I think as the book really effectively shows, we're no longer in a situation in which the classic household or the classic community or the classic nation view of economics works effectively. We're now in a global economy. We're not united by a similar sense of relation to a certain geography or a certain state of land. But on the other side, the really interesting thing is if we increase creative thinking, we increase social connectedness. And so it shows that when social connectedness increases, so does connectedness to nature and all that comes with that.

Kate: Can I jump in there now and say, so one of the reasons why we created this tool called Doughnut Unrolled for local places was to highlight both a local aspirations of a place and that would be what it's visible and looks and feels like to be in a place and its global responsibilities precisely because, as you just said, everything is interconnected and you know wherever we are if we think about the clothes we're wearing, the food we're eating, the consumer products we're using, the electronics that we're in our hands, they've come from all over the world. They've drawn on materials, minerals, matter from across the world, and they've had labor put into them by people worldwide. So we are inherently connected to people worldwide, wherever we live.

In Doughnut Unrolled, we highlighted that actually we need to have two ecological concerns or two concerns with the living world. One is the local, about the ecology of our local place. And here we use ideas from biomimicry and the thinker Janine Benyus. If we were in, I don't know, if we're in the city of, let's imagine we're in Stockholm, you say, okay, let's go to the

nearby wildland next door. Take us to the wildland, the healthy natural ecosystem of this place. And let's actually measure nature's generosity here. Nature has a genius for surviving and thriving in every place. She's generous because she keeps producing conditions conducive to life. Everywhere nature is, she's figured out, whether it's at the top of a mountain or in a valley, in a wetland, in the tropics, in the temperate regions on the coast, nature's figuring out how to store carbon there, how to cleanse the air, how to filter the water, how to house biodiversity.

How can we bring that generosity into human settlements or into human agriculture? How can we build cities that don't release carbon but actually store it, that house wildlife, that cool the air instead of creating urban heat island effects, that absorb the rain instead of creating flash floods? So there's big questions about local ecology and of course this becomes very real in people's lives of air pollution, degradation of their locality, and even just the feeling we have when we are in a place in connection with nature has a massive impact on human health and well-being. So that's the local ecological question and that's what's visible.

But then let's think of all the invisible ecological connections we have through the clothes we buy, the food we eat, the electronics we use, the goods we buy, the construction materials that build our houses and buildings. These have come from all over the world and these are having impact invisible to us here, but through our consumption of virtual water and virtual carbon emissions elsewhere in the world, we're having impacts worldwide. So we also have to take account of that. And that's where the climate change and material exhaustion comes from. So we have to think local ecological health, but also global ecological impacts.

And this is, I think as you're saying, it's about increasing our awareness of our relationship to the living world. We're embedded in the web of life. Part of that web is very, very local, and we can feel it tangibly in our own lives, on our own skin, in our own neighborhoods. But also, part of that web has very, very long threads to people on the other side of the world, and we have a responsibility to understand it, to make it visible to ourselves, and to reduce that impact. So it's a local to global ecological awakening that's required in the heart of our economic thinking.

Noah: I think it's fascinating and I think it's so important to recognize that we're entangled in this wide web of life. I find it really interesting, I've noticed that you call nature she, and obviously there's precedent for that and it's really interesting.

I'm interested in how, if we look back on the young Kate, do you think your view of nature, if we're going to call it nature, is sort of othering it, or the view of the web of life which we're part of? Do you think personally that's changed much, or do you think you've realised that more?

Kate: I wasn't raised in a deeply ecological family with a deep ecological awareness. I had the privilege to be raised around trees and greenery. My parents had a beautiful garden, but

it was a very manicured garden, right? It was high intervention in the garden. It wasn't about understanding ecosystems and letting nature do her thing. But I had the privilege of being raised in a community where there was a river and there were trees. But I don't remember as a child, I, you know, some people might come on this podcast and say, yes, as a kid, I ran wild in the woods and this was my first home. And that wasn't the case for me.

I remember my first ecological action was fury at litter. Adults were throwing plastic beer cups along the river, and I organized a group of about 20 kids. I was about 16 and I organized a group of about you know, 10 to 15 year olds, and we went along the river and picked up the litter. So that was my ecological awakening of a kind.

No, my awareness has really changed over time. I mean, I was a teenager of the 1980s. So there was acid rain. I remember the first time on the TV news when they said there's something called the greenhouse effect. So I was growing up with the beginnings of this awareness. And one of the reasons I went to university to study economics was I wanted to help tackle that. And I was just gutted and appalled when the tools weren't forthcoming. So in a way, my ecological awakening was in shock at its absence in the subject that I'd chosen to study.

It has changed over time. After university, I lived and worked in Zanzibar for three years, and worked with communities in the villages across the two islands who were deeply embedded in the living world, whose resources were all from the forest. And I was working with craft producers who were drawing their resources from the forest. And so I saw a much more ecologically embedded community and world there. But no, it's been my own Western mindset recovery programme. I'm on my own journey back towards something which is much more deeply held in other cultures and learning to think of the web of life.

And yes, I do call nature she, because I think nature's fundamental dynamic is regenerative. And I think it's a quality particularly evident and obvious to us in female reproduction in the generation of regeneration of life. And it's a feminine quality that I think can exist in both men and women, but that feminine quality of regeneration, of holistic thinking, of not maximizing the single, of not seeking domination but seeking interdependence, I think that's a feminine quality. And I like to speak of nature as she. It can cause little ripples if you go into a conference of financial economists and you say, you know, the living world and nature as she. But then that's one of those moments where it's important to challenge the mindset and what we feel comfortable about. It touches closer to emotion. Being living beings rather than economists talking about price.

I like pushing on our own boundaries of what feels like comfortable language. We all need, as Hannah Arendt advised us, to rename our stray dogs and we need to give them names that actually make us—they're not even our dogs, right? They definitely don't belong to us, because no dog or cat belongs to anyone. There are living beings living alongside us.

Noah: And I think the deep beauty in that is we also rename ourselves. When we emulate nature, we recognize that we ourselves, we can regenerate our thoughts and we can grow in different directions and cyclical directions.

It was a pleasure talking to Kate and our conversation really brought home to me her fundamental challenge to any human self-conceptions that overemphasize our separation from nature and put us as outside onlookers on a pedestal, tasking ourselves with manipulating nature to fit our wants and desires. However, as our conversation touched upon, when we start to recognize that we ourselves are sustained and embedded within nature's fractal structures, it starts to make much more intuitive sense that it's unsustainable to simply chase after growth for its own sake, especially when it causes such destruction to our natural environment. Indeed, the natural balance of things isn't constant growth. It's also imperative that we work on our roots and make sure that we're firm and resilient and, crucially, sustainable.

Kate's challenge to our thinking, perceptions and notions of who we are in relation to the world around us, can, I think, bring about a change in our own thinking, our own self-identification, and a change in how we identify ourselves in relation to nature. These are themes I continue to think about in the next episode, where I travel to meet Philip Lymbery, Global CEO of the charity Compassion in World Farming. We discuss how modern industrial farming and agriculture practices, which push our planetary boundaries over their limits, reflect a deeper disconnection with nature and the natural world.

I look forward to you joining me for the next episode. Until then, thank you for listening. I've been Noah and this has been *Entanglements*.

Credits: Written, produced, presented and edited by me, Noah Rouse, on behalf of the Jesus College Intellectual Forum. Original music by Xanthe Evans.