

### 3. THE MISSING CIRCLE

**Dan** Um, and then, well, I met in the morning and then we met at and um, yeah, I was in the car with Derren and he was, he was didn't tell me what it was, but he was like, we're going to blindfold you. We're going to walk you up to something. And, 'don't worry'. And anyway, I was convinced the whole time I was blindfolded I was on the edge of something and I was like 'don't let go of me' and they were like 'you are not on anything, you're literally on grass!'. I was like, "I don't believe you" *[both laugh]*...

**Dan** Um, and then they showed me it. So I was on the ground and then they showed me like "this is..." turned me around "this is what you're going to kind of stand on". Um...

This is Dan Cash, and he doesn't like bridges...well, no, I mean; it's worse than that - he's *deathly* afraid of them. He can't set foot onto a bridge, without getting dizzy, feeling sick and starting to panic. He *knows* it's a kind of silly fear but he just can't get his head around happily walking across something *so* precariously suspended in the air. It's even worse if there is a river beneath; the dark unknown watery depths, down there waiting for him.

And yet here he is, in 2012, on a chilly overcast morning, standing on the grass by a huge river and a huge bloody bridge. The river is the River Don, in Doncaster, and the bridge is actually a viaduct, a massive grey structure of stone and metal.

Dan is wearing a blindfold at the time, so he could only see all this when it was taken off.

**Dan** It felt enormous, I think it was 140 feet kind of, something like that. Um, and then I got there and there were, there were some steps leading up to the railing and I was like, right...Um, and then I kind of climbed up the steps, which was fine. And then I stood at the top and I was like, right, this is actually a bit like mad, mad...But I didn't [extend pause] like, I didn't feel [extend pause] a lot. Like I felt it was all, I didn't feel scared at all. I think an overwhelming thing was that I'm doing something that I never, ever would have thought I'd do.

No, not if you can't even cross a tiny bridge in your hometown, so I suppose the question remains, why was he doing it? Or, rather, *how* was he doing it?

**Derren** I'm here at the headquarters of Cicero pharmaceutical solutions to make a documentary about their new wonder-drug called Ramiadyn, which they claim completely eradicates

the experience of fear. Having worked under the high pressure conditions of warfare it is now being released for civilian use. And tonight we are going to follow the first members of the public to take this new drug....

### *Series Intro*

My name is Tilly Robinson and you're listening to *The Water We Swim In*. A 7-part mini-series that explores what system-change really means. Each episode investigates a story that helps us understand the way our society's been designed, so we can see the invisible forces leading us towards the climate crisis...because in order to know where you're going, you first need to know where you *stand* and how you got there.

Last week, we discovered why our scientific model doesn't really understand how nature works, and how embracing *complex systems* is key to changing that.

In *today's* episode, we're going to look at one of the most important social narratives ever written and check it for plot holes.

### **PART 1: THE INTERPRETER**

Dan was twenty and working as a teacher in France when he read on Twitter that Derren Brown was looking to find people to appear on his new show. He's a big fan, so Dan responded to Derren's Tweet – but he never heard anything back, and soon he forgot all about it.

Several months later, he received an email from an unrelated production company asking him if he would like to appear on a new TV show. They were looking for participants who were willing to try a drug that might cure them of their phobias.

Dan thought: I'd quite like to be able to walk across a bridge.

And before he knew it, Dan was in the headquarters of the pharmaceutical company Cicero being injected with a drug called Rhemiadyn. He was then given several bottles of capsule pills and told to take them twice a day for the next few weeks to see whether the drug could lessen his fear of bridges.

But, as you might have guessed, this *was* a Derren Brown show. And Derren loves a twist.

**Derren** Rhemiadyn doesn't exist [*record scratch*]. I made it up. It hasn't been developed for the military, anywhere. Cicero doesn't exist either. The injection they're getting is saline solution and these capsules that they'll be given later contain nothing more medicinal than sugar.

Everything Dan was taking was a placebo.

Now, it's possible *you're* not completely surprised by this, Derren Brown is an illusionist, after all. Trickery is his trade. But he's very good at it, and Dan had been well and truly hoodwinked.

You can't blame him. The amount of detail that went into setting up this fake drug trial was staggering. I mean, a whole facility was created, filled with actors pretending to be scientists. Contracts were signed. There were even stickers on the windows for different pharmaceutical brands.

Everything needed to be as convincing as possible, because what Derren and his team *really* wanted to find out, was what would happen if someone with deeply established fears *truly* believed that those fears had been chemically eradicated.

In Dan's case? He was able to sit on the edge of Doncaster's massive viaduct, his legs dangling above the void

[Clip from 'Fear & Faith' emotional music] - 34.08

**Derren** Wow

**Dan** Wow

**Derren** Look at you Dan Cash!

**Dan** I can't believe I'm doing this! Now I know that I'm not scared of bridges or heights, that the phobia has gone, in my self, I know it. I can do this. I just feel so much more optimistic. So much more positive...

**Derren** And if someone was thinking about taking Rhemidyan, what would you say?

**Dan** Oh, I'd say do it. I'd say definitely do it.

**Derren** Good....there is one thing I haven't told you about Rhemidyan...

**Dan** Um, so yeah, I sat down and Derren sat next to me. And then that's obviously when he said it was a placebo, which again, I wasn't expecting... it's *ridiculous* that I wasn't expecting it....Like I, and then almost expecting everything to just go.

So I was expecting the whole like fear to just suddenly come back. Cause I was like, it's a placebo. It's not real. Oh God, here we go. And I kind of was waiting for this big heart drop moment of, Oh my God, what am I doing?

But he didn't have one. The fear didn't come back. It still hasn't. Dan happily skips across bridges to this very day. And that tells us something.

What this particular Derren Brown special was trying to demonstrate was the sheer power of stories.

Derren is an illusionist and showman, which means he has a particular interest in stories; they're the key to making something feel *magic*. Get an audience to buy into a narrative, and you control what is real. It's a central part of his trade, he understands the power of them and, crucially, their malleability.

And in this TV special, he wanted Dan to understand the power of stories. Quite simply, Dan was given a chance to change his mind. He believed in a narrative that went: 'When I walk over that bridge, I will be scared'. The placebo allowed him to believe in a different narrative: 'When I walk over that bridge [for whatever reason] I won't be scared.' Rhemaydin gave him permission to change the story he had about himself, and that was enough to change the reality of his experience.

The reason this worked for Dan, and for all the other participants in Derren's TV show, is because they were tapping in to a fundamental neurological process; storytelling. Cognitive psychology has now shown, for a while, that our brains are hardwired to create narratives - it's the way that perception works.

The Left Hemisphere (where the language centre of our brain is located) is nicknamed 'The Interpreter'; because it's constantly sifting through stimuli for us, making causal connections and 'creating order out of chaos'; creating a narrative to explain our actions, emotions, thoughts. Without it, we'd drown in a sea of details, overwhelmed by all that data.

In the same way that we need a mouth and a stomach in order to eat and digest food, we need our storytelling ability in order to digest reality. Otherwise it would all be too *raw*.

We use it all the time: let's say something happens to you. Let's say...you lose your job. Now, the way we see this, is that the *event* (losing your job) - something external to you - *makes* you feel something. "Getting fired *made* me sad". "My boss *made* me feel worthless". That's how we see

it. Except, that's not really true, *it's missing out a crucial step* - where 'The Interpreter' gets to work. The truth is, losing your job might make you feel *all manner of things*; angry, embarrassed, relieved? dejected, worthless, proud? (if you disagree with the company or something)...and it depends on the *narrative* you have about it: *your* perception of the event and how it corresponds to the story you have about yourself.

But, because it's an implicit process, we aren't really aware of doing it. We don't consider it. And that can cause problems.

Ok, here's Matthew, another writer on the podcast. He's going to try something with you.

**Matthew** Ok, here's an exercise I want you to do. You'll need to write something down, so grab a pen or open up the notes app on your phone. I want you to write down a word, all caps. The word is *whirl*. W H I R L. It's an anagram, and I'm going to give you 8 seconds to untangle it. *Don't* pause the podcast - no cheating.

*[8 seconds pass]*.

OK, hopefully you've managed that. If not, don't worry, we're just going to move onto the next word, which is *slapstick*. S L A P S T I C K. You have another eight seconds. Go.

*[8 seconds pass]*.

Did you manage that? OK, great. Now, the last word is a slightly unusual one: *cinerama*. C I N E R A M A. Go.

*[8 seconds pass]*

Alright, stop. Did you get it?

If not, don't worry. Because *you weren't the only one*.

**Charisse** This is a 9 year old activity this is not to tax you, these are easy things. This is just to kind of get you feeling, what we're going to go over. So everyone take out a piece of paper.

**Matthew** This exercise was devised by psychologist Charisse Nixon, who tried it with one of

her classes at Penn State University. She gave her students a list of three anagrams, and asked them to put up their hands once they had solved each one.

What she *didn't* tell the class was that one half had been handed a different list to the other. The first half received the anagrams I gave you: *whirl*, *slapstick*, and *cinerama*. But the other half received another list, in which the first two words were different: instead of *whirl* and *slapstick*, they were *tab* and *lemon*.

Now, *tab* and *lemon* are really easy anagrams. You could probably solve them in under five seconds without a pen and paper: *tab* becomes *bat*, and *lemon* becomes *melon*. Whereas *whirl* and *slapstick* aren't just difficult anagrams...

...they're actually impossible. Unsolvable. Sorry Imagine you're in Charisse Nixon's class at Penn State – specifically, the half of the class who got the impossible list. You're looking down at *whirl*, struggling to unscramble it, and then you start to see a lot of your fellow students put their hands up - they've finished the task already. *You* don't know that all they've done... is turn *tab* into *bat*.

Ms Nixon tells you to move on and try the next word: *slapstick*. Again, you can't see any solution, and again, other hands are going up – the hands of geniuses, it seems, although unbeknownst to you these geniuses have simply found *melon* in *lemon*. You feel frustrated, maybe a bit stupid, why can't you do this simple task?? And then you come to the third and final word.

Here's the thing: *cinerama* is an anagram of *American*. But did you spot it? Maybe, maybe not. But if you didn't, don't worry, because I did everything I could to make it hard for you. I tried to make you feel like a *failure*, by giving you two impossible tasks up top and pretending they were easy.

Charisse Nixon did the same thing to her students - and made it worse by getting them to believe they were less clever than their classmates.

## Charisse

Here's what we did this for, I was able to induce learned helplessness in this side of the room within about 5 minutes. I want you to think about what happened in this left side of the room when you saw the right side of the room *raising* their hands because they already had the task done! What happened to you during that time?

She planted seeds for a story they would tell themselves – a story in which they couldn't complete the task.

It worked – they believed the story, they couldn't find cinerama, and they failed. The results were the same when Nixon repeated the experiment with other groups. It's a phenomenon known as 'learned helplessness'.

This is the trap we can fall into. Because we build these narratives constantly and *automatically*, we ignore our involvement in their creation and believe them to be objective *fact*. Which can make us the victim of our own bias thinking and our own self-imposed limitations.

And this is what Derren wanted to demonstrate to Dan, because once you realise your own active role in building these narratives, it gives you the power to check them for falsehoods, to re-write them if need be. If you have power over your stories, you have the power to change your reality.

So...what's this got to do with economics? Well...of course, these stories aren't limited to personal ones. We partake in social and cultural narratives too - collective ways of seeing the world, like religion, philosophy, social traditions - things that shape our society.

But, of course, for the really *serious* stuff - when we want to *understand* the mechanisms of the way our society works so we might actively shape it - we like to make things a little more...*tangible*. We like to rely on *science*. We like to make sure that it's *fact*. *Not* just a perspective, or a story. That's why we like to use data collection, analysis, peer-review...*objective* processes.

And what's more serious...more important ....than economics?

Economics is one of the most significant and influential practices in today's society, because it helps us understand the way society *works*. 'Money makes the world go round' and there's hardly a government, international agency, or large commercial bank that does not have its own staff of economists. It's the mother-tongue of public policy, affecting almost every area of our lives.

And yet...going into this. I knew...nothing (?) about economics. Diddly squat. Despite the fact it's - *evidently* - pretty central to how our society works. It still, to me, felt very... *opaque*. Intimidating? *Boring*, too probably. Out of my remit, definitely. I think a lot of us feel like that. And to be honest we get by pretty well knowing the little we do - so what's the incentive to

learn more. They've got it covered.

But then again, if you don't understand any of it...how would you know?

## PART 2: GROWTH, FOREVER

So, I decided I wanted to get to grips with it, at least a bit and I started by going back over the notes I had from the *one* unit of economics I did in my post-grad degree. And I found this definition: 'The study of wealth'. Ok... and after some googling I found that wealth is defined as 'goods and services', so economics is the study of the production and movement *of* those goods and services.

Right, ok. That still means very little to me.

I did some more research, did a refresher course, and looked at supply and demand graphs etc. and picked about this much: economics isn't *just* about money. It's about how humans behave, and the value they place on things too. It's kind of about...everything.

Like, let's start with breakfast. Say you were feeling classic and understated this morning, and went for *cornflakes*. Right, well – they didn't just appear in your house. The seeds for the corn had to be sown on land that was purchased or rented (*economics!*). Then, after about 6 months the corn has to be harvested and taken to factory where it's rolled out into those little flakes that are toasted; all this done by workers, who are paid a wage (*economics!*). Then the flakes are packaged and sold to a supermarket which has to determine which price to sell them at (which depends on things like how rare they are and how much demand there is for them) - which is economics, too. Then, finally...because other people have been paid to make the packaging attractive and build a brand that is appealing, you choose to start your day with a delicious bowl of toasted corn. It's all economics!

So, that's clearer. But - knowing that it's *everything* isn't actually very elucidating.

I wanted a way *in*, you know, to really understanding it. And then I thought...well, *what's its goal?* In acting it's well known that the key to getting into your character's skin - to understanding them and what they're about - is to establish their *motivation*. And that's because it gives you particular insight into who they are. Want to understand someone? Ask them what they want, their desires, plans and dreams - what's the direction in which they hope



to advance their narrative. It makes sense.

So, if we're trying to understand our economy, then perhaps we should think about its aims. What does our economic policy want to achieve? What's its *goal*?

*Politicians and economists talking about economic growth*

It wants to get bigger.

That's the **goal** of our economy, and it's a clear, explicitly-stated one. To get as *big* as possible, as *quickly* as possible. It's on all the meeting agendas, all the Important Documents. That's its MO. It's one true desire.

So what does that mean? Well, growth means more goods and services this year than last year, and even more next year. It means more cornflakes. More farmers to create them, more supermarkets to sell them, and more people born to buy them and eat them. The total value of all these things is measured by GDP, 'gross domestic product' – gross meaning total, domestic meaning within one country, and product referring to both goods *and* services. When the economy grows, GDP goes up, and vice versa.

Sounds ideal, so far.

**Tilly** I know you've talked about the biggest barrier being, just deafening silence, do you think people are more willing to listen now.

**Herman** Yeah, that's a, that's an important question. I think it continues, the silence....I mean, at least looking at it from my own point of view. I mean, I'm, an old man now, so I've been at this a long time and early on, you know, what was dominant was, I guess was silence. I mean, well... "Daly's a little odd, let him do his own thing".

**Tilly** And did you, did you receive any hostility for those, for having those views? That were sort of...

**Herman** Yeah, sure. Uh, partly there was benign neglect, and partly there was, there was definitely hostility.... I er, um, I.... *(trails off)*...

May I introduce you to Herman Daly. Herman is a very skilled economist, but first and foremost he is a Texan gentleman. When I emailed him to ask if he would talk to me, he didn't reply in the usual way, with the list of questions and quotas. He simply wrote, 'Tilly, it would be a pleasure, let me know how.' Maybe style like that only comes with age – Herman is eighty-four and kind of resembles a dignified tortoise in aviator-style glasses. Through zoom I caught a glimpse of his life: shelves heaving with books, notes pinned to the wall. He lives with his wife of sixty years, Marcia, who - after we had been talking for a couple of hours - appeared and started tidying up quite loudly. That's when I realised it must be lunchtime in Texas, and wrapped up our interview.

But our conversation *started* with Herman suggesting that he tell me a story.

**Herman**        So maybe, maybe I can tell a story. This is, this is actually a very true story and it takes place in 1992 when I'd gone to work for the world bank in their environment department.

Herman was born in the 1930s, a decade defined by the Great Depression, a time of unemployment and widespread destitution. Maybe it's no surprise, then, that when it came to choosing college majors Herman chose economics. 'Well,' he thought, 'maybe it'll help resolve poverty'.

And over the course of his long career Herman did introduce some seminal ideas...so, when he was fifty-four he was hired by the World Bank as one of their senior economists. And he hoped he could do some good there.

**Herman**        The world bank does, every year or two, what they call a world development report, which takes some topic and goes into it in depth...And in 1992, there, they were doing the first one ever on, uh, on environment and development....So I was very pleased with that. This was great. This was a real chance to say something. So here comes the first draft of the report, lands on my desk, I eagerly start to read and there in the first chapter pages was a diagram and the caption of the diagram was "The Relation of the Economy to the Environment". So, okay. That's good.

Diagrams are a big deal in economics. The diagram that the World Bank gave Herman was a riff on something called Samuelson's Circular Flow. The Circular Flow also looked at the economy as a whole by imaging it as a sort of plumbing system where money acts like water, being pumped around the pipes, syphoned off and reintroduced by various drains and taps. It's used to demonstrate the interdependence of production and consumption, showing how wealth moves

through society. One engineer-turned-economist even constructed a working model, a hydraulic machine with *actual* pipes and water.

And this particular diagram was incredibly influential. The book it was first published in is the best-selling economic textbook of all time. In a way, the diagram forms the foundation of our economic story.

But Herman felt there was a problem with it. It was missing something.

The earth.

Paul Samuelson was trying to demonstrate the flow of money around the economy. He did that very nicely, so nicely that it became the go-to diagram of the economy. Which is a problem, because, of course, the economy isn't just a diagram on an otherwise blank page. It's not a hydraulic machine exhibited in an empty room. It exists within the biosphere of our planet, requiring colossal amounts of material and fuel, expelling colossal amounts of heat and waste. When I described the system of exchange that produces your cornflakes, I didn't mention the flow of energy and matter that is involved, the fact that everything in that process relies on resources from the earth, and all the waste that is produced by that process is expected to be absorbed by the earth. And of course, it's not just cornflakes. This goes for everything that's produced and consumed on the entire planet. All the goods. All the services. Used by everyone

The fact is, the economy can't exist without the environment, and yet it is almost always conceptualised without it. Samuelson's Circular Flow demonstrated the flow of money without a wider context, and for years and years everyone did the same. Insert pause. We forgot the earth. Forgot that we lived *in* it and forgot we are dependent upon it.

And that was OK, because now - in 1992 - the World Bank has hired Herman to show them the wider context. So here he was, looking at their first attempt at a new diagram entitled 'The Relation of the Economy to Environment'. He was excited because, in his words 'this was a chance to really say something'.

**Herman** Well, the picture was a rectangle labelled economy and an arrow coming in from the left label input and an arrow exiting to the right label output, no further discussion in the text about the diagram.

An arrow coming in from the ether, and exiting, apparently, back into the ether. Not exactly what Herman had in mind.

**Herman** I said, well, okay. Um, so I wrote my comment. One has to try to be, uh, a little bit, um, uh, careful with what one says and, you know, so I said, well, this is a very good idea to draw a diagram. That'll get us started in the right direction. Uh, but this diagram does not have the environment. It only has a picture of the economy. And, um, so the, the arrow coming in from the left comes from nowhere. We don't know what it has. The arrow exiting to the right goes nowhere, we. We don't know where it's going. So what we need is to put in the environment, let's draw a great big circle around the rectangle and we'll label that circle environment. Then we'll know that the environment is supplying the input and it's absorbing the output.

So, Herman did just that, he expanded the diagram to represent the biosphere in which the economy existed, and he did it as simply as he knew how: by drawing a circle around the rectangle that was already there. This was the version he submitted for their consideration. Insert pause.

So...back it came, and they'd made some alterations. They'd changed it to from a circle to a big *rectangle* around the little rectangle - to show layers of the economy instead: a picture frame, Herman described it as. But the circle had gone, so still no environment.

**Herman** So I wrote back and basically said the same thing all over again, and made a few extra suggestions. Uh, then the, here comes the third draft. After that, no more diagram. They completely gave up...It's too difficult to draw a diagram of the economy, to the ecosystem, to the larger ecosystem. And that, that really, uh, that really got, got me. I said, why, you know, why is it so difficult? Well, it's difficult because if you do that, it threatens you with obvious questions to which you do not have a good answer.

As simple as Herman's diagram was, the World Bank found it impossible to accept. Because "it threatened them with obvious questions to which they did not have a good answer". Because as soon as they let Herman draw that circle, our economic story didn't make any sense.

Our goal is growth. But, like, forever. Our goal is *perpetual* growth. And that would be fine if we had the whole universe to expand into, if we had an infinite stash of material to draw from and an infinite amount of space to chuck the byproduct. *If* the economy existed within a void. But it *doesn't*, it exists within the earth, and that's all the space we have.

And as we already know, there is only so much carbon our atmosphere can handle, only so many chemicals our eco-systems can absorb, there is only so much *space* we can occupy. Already, we know that we're in the 'Danger zone' and pushing the limits of our 'planetary boundaries'.

These days, Economics is all about maths, so let's do some calculations ourselves.

Anthropologist Jason Hickel estimates that the maximum amount of materials we could sensibly consume a year is about 50 billion tonnes – 50 billion tonnes of *stuff*- to make, consume, and dispose of. After that, we start destroying the web of life our existence depends on. We're currently using 80 billion, which is already 60% over the safe limit but according to our goal we want to *continue growing* by at least 3% each year. So if we carry on as we are, by 2050 we'll be using 180 billion tons.

Humans aren't really programmed to understand exponential growth. But we want our economy to grow *exponentially*. And 3% economic growth each year means the economy *doubles* every 24 years. 180 billion tonnes becomes 360 billion, 24 years after that? 720 billion tonnes, and it continues, doubling alllll the way up to one hundred and forty-four thousand *billion* tonnes of material *per year (!)* by the year 2100. That's a long way from 50, and very much not feasible for our survival.

I don't know about you, but learning, it struck me that the costs are outweighing the gains. That the economy is, by definition, becoming uneconomical.

But, of course, if you don't *do* the calculations, you don't have to deal with the problem.

**Herman** I suppose, so you just, you, what ends up happening is you do not perceive or register any costs to growth. I mean, you're not giving up anything when you grow, there's no opportunity costs. You don't grow into a finite environment. You just grow into an infinite void. Uh, well, that's kind of silly. I mean, really when you stop and look at it, but of course the secret is don't stop and look at it. Don't draw the diagram.

\*

**Donella** Let me just give you some complicated examples because I don't want you to get the impression that loops occur singularly. We may pick them out to look out singularly, but almost always we find loops connected to loops, embedded in

loops, and so on, and then things get a little complicated.

Herman, brilliant as he is (and by the way, he *is* - he was nominated for a Nobel Prize in 2018) was not the first person to point to this flaw in our plan. The person you can hear is Donella Meadows giving a lecture in the 1970s. She looks like something from Little Women: a pinafore dress layered over a plaid shirt, a low bun where her hair sweeps over her ears, she speaks very gently. But what she had to say certainly packed a punch.

Meadows' scientific field was *complexity*, or...you might know it as 'Systems Thinking'.

**Donella** ...Today I would like to try to try and tell you what I regard as the essence of system dynamics, as a philosophy for learning about complex systems, and it is a philosophy. I want you to understand that this is going to be a difficult task for me to do, it's kind of like describing the lenses in your eyes, which you never see, you only see through.

Donella, was a *systems* specialist. Which, we know from last week's episode, means she saw the world in a different way to most scientists. She saw *the whole picture*: she knew how *interconnected* everything is, how difficult it is to control nature... and understood the very real risk of tipping points and *system collapse*.

So, in 1972, along with several other authors, she wrote a report in which they calculated, using *systems thinking*, what will happen if we keep chasing growth. Their findings were pretty clear: we'll run out of stuff, we'll run out of space, and that will lead to system collapse. They called the report 'Limits to Growth'. It was actually *really* widely read - went on to become one of the best-selling environmental titles in history.

And *still*. It was ultimately ignored.

How could they ignore something like that? How could they make such a massive mistake...and then *not* revise it? Then *refuse to draw* Herman's diagram.

*Economists!* Who create 'the mother tongue of public policy', who advise banks, governments, and international agencies. How could they not revise their theories when we're clearly hurtling towards catastrophe?

Well...maybe because, in reality... the nature of economics has actually been ambiguous for centuries. The Ancient Greeks thought of it as an *art*, 'the art of household management', but by

the 1600s science had become more prestigious, thanks to people like Isaac Newton, and economists vied to be viewed with the same authority. So it adopted some aspects of science, and since then, economics has been *thought of as a science* – initially as a political science, and then as a behavioural one.

*But*, it's never fully embraced the scientific process...the one that really makes sure you're dealing in *objective fact*.

It's sort of been an academic hybrid ever since. And that's a weird combination.

**Herman** The way, the way that this has happened, I think historically is that there has been external criticism of economics and the response of the, uh, economists has been to, uh, to tighten the circle to, uh, well, they used to teach methodology. Now they don't include courses in methodology anymore. There used to be courses in comparative economic systems, capitalism, socialism, and so forth. Now the idea is, well, you know, there's no alternative...So, um, so whatever is comes under critique from the outside gets jettisoned and you circle the wagons more tightly and defend your, your little core area.

**Tilly** Yeah. That sounds to me more like it's becoming less of a science and more of an ideology...

**Herman** More of an ideology. Yes, I think that's true now.

According to Herman, economics has become an ideology that thinks of itself as a science, a discipline that has confidence in its own objectivity, without practising any.

That is to say *it's a story that's forgotten it's a story*.

**Herman** Well, I think it's basically a fairy tale and the Swedish girl, she nailed it. She called it fairy tale. And, uh, I think she hit the nail on exactly right. It is a fairy tale. It's just like the, you know, it's, uh, the King's new clothes, you know, it takes the child and say, look, the King doesn't have any clothes on.

If something is part-narrative, obviously you can get things *wrong* but if you're convinced that what you know is hard cold irrefutable *fact*, you're probably not going to be willing to review it. So, when somebody comes along and *points out a flaw in your plan?* Suggest *changing* it? Well,

you're going to ignore them. 'Daly's a little odd' remember? 'Let him do his own thing'.

But obviously, that becomes harder to do as time goes on. Donella Meadows may have been disparaged and laughed off the stage by many of her peers ... but it turned out her calculations weren't far off. In fact, if you follow her projections through to 2023 - we're pretty much right on track, following the trajectory she laid out 50 years ago.

And the effects are becoming pretty difficult to ignore: biodiversity loss, chemical saturation...climate change. It's becoming apparent we need to do something, even to those who think Donella and Herman are.... a little *odd*.

But if we have to do something and we're *not* listening to either of them... what's the plan?

### **PART 3: THE PLANE THAT CAN'T COME DOWN**

So, the problem economists are facing: we don't want to limit economic growth, that is still our goal (for lots of great reasons) but also, it's becoming harder and harder to ignore the fact that unfettered growth has serious and scary repercussions - for both us, and the economy.

So, what do we do?

I'm going to borrow an image from economist Kate Raworth here to explain the solution -

*Sounds of being inside a plane*

Imagine economic growth as an enormous passenger jet, a commercial airliner, and the whole human population is on board. It's nice on the plane - for those of us in business class, at least - but the pilots in the cockpit know that not all is as it seems. There's something wrong with the plane, a small malfunction that means big trouble. They have to make a decision about what to do.

Now, some of these pilots - it's a big plane, there are a lot of pilots - some of these pilots don't believe that there's anything wrong with the plane. They want to keep flying, and are happy to ignore any passengers who complain about the terrible grinding noise coming from the engines. What do passengers know about planes, anyway?



Other pilots recognise that there's a problem, but they don't think that there's any way to safely land the plane. A smooth descent isn't possible – the only way this plane is coming in contact with the earth is at 300mph, meaning big explosion and instant death for all those on board.

*Their* preferred approach is to try and fix the plane while it's in the air. To get human ingenuity to transform the engine, make it electric and solar-powered, allowing us to *fly forever*.

This is something called "Green Growth".

Green Growth is the idea that we can *decouple* (or separate) economic growth from ecological degradation. That we can keep growing the economy as planned, but by switching to renewable, clean energy, and increasing the efficiency with which we use natural materials, we won't have to destroy ourselves in the process. Growth happens, but resource depletion and pollution don't.

We keep the plane in the air. Keep growing but change *the way* we do it. Just *tweak* the design. It makes sense. It's been sanctioned at the very top, the Paris is based on its possibility...it's the horse that everyone is backing.

I wanted to talk to someone about it, to understand how it would work. But having talked to Herman, I thought it prudent to find a top economist who has been adequately critical of perpetual growth, someone who understands the scale of the problem in the engine and who can appraise the 'fix' fairly.

So, I contacted Tim Jackson. He's a serious man, with serious white hair and serious black eyebrows, so it was interesting to find out that he had a more playful, creative side. As well as being one of the top economists in the UK, Tim's also a playwright.

*Clip of one of Tim's plays*

But he was all business when I asked him about Green Growth.

**Tim**            What economists come along, and they say, actually, you know, if we're clever enough with technology, we can reduce the material impact of that growth, almost indefinitely. We can reduce the carbon associated with fossil fuels by changing it to renewable energy, we can improve the technology of our processes over and over again. And what that will allow us to do (and this is the economists saying, this really) is, that will allow us to an economic activity

measured in money, but at the same time, reduce the material impacts that it has on the planet. And we can go on doing that indefinitely is their argument.

Tim explained to me that Green Growth relies on the development of technology that changes the way we consume - that helps us become *super* efficient with our materials: use less stuff, keep our stuff longer, produce less waste. If we make it so that the economy doesn't have a negative impact on our planet, then we can keep growing it, forever. Obviously that's not going to be easy: we'd have to switch from a goods based economy to a services based economy (so, think more 'classes' and 'tours' for birthday gifts than new clothes from ASOS). It would have to become circular, too: materials are cycled around and around: shared, reused, recycled.

Not easy. But doable...right?

Well. There is one problem, the technology needed for this to work doesn't exist. We just have to assume that it will develop in time. And given our crazy rate of technological development over the last hundred years, taking us from steam engines to facial recognition perhaps it's not crazy to assume that we'll keep on evolving?

Fix the engine in the air. Tweak a few things, and keep flying forever.

**Tim** And so the question around that, and it's a, it's a really serious question is how far can you go with that technology? How far can you reduce? And also how fast can you reduce? Because even if you can do it for a certain number of years, you know, to reduce your efficiency, and even if there aren't any limits on efficiency itself, which it turns out there are for thermodynamic reasons, the question is, can you run fast enough up that escalator as it's coming down faster and faster towards you because you've expanded the economy in the process.(16:07)

So, it's a great idea. But here lies the problem: it doesn't matter how quickly you climb the escalator if it's *constantly speeding up, coming faster down towards you*. We could be one *hundred* times more efficient than we are, but if the scale of the economy keeps growing exponentially as well, our impact remains as damaging as ever.

**Tim** It's a fantastic idea, green growth, but the reality of, of it is, is, you know, historically at least, we just haven't delivered green growth. And the challenge of delivering it - even over the short term is - is really substantial because of those dynamics. And the challenge of delivering it *forever*, if you're talking about infinite economic growth, which some economists do, is impossible.

**Tilly**            Hmm. Impossible?

**Tim**                Yeah. Thermodynamically impossible. There are limits to the efficiency of processes. And so at some point, you know, it might not be immediately, but at some point when you reach those limits, you can't just substitute away from technologies and achieve economic activity that continues to grow exponentially.

Impossible. This is obviously a bit of a blow. We *can't* fix the engines whilst the plane is in the air. And that seems to be our only plan.

And if you're still dubious as to whether it might work, Matthew did some more research, just to double check it. Here he is again -

**Matthew**        *Despite* the fact that it's thermodynamically impossible in the long run, the UN built a model to prove that green growth *will work* - to prove that, if we *commit*, all will be well in the end. They carefully constructed this model running the best case scenario: saying, let's imagine we do a really good job in actually implementing policies that create *green growth*. Let's say we encourage clean energy by whacking a *huge* price on carbon emittance (so people don't want to do that), and we tax the extraction of materials from the earth (so people do less of that); let's assume that governments around the world adopt pro-climate policies; let's be optimistic, and assume that technology will rapidly advance and more than *double* our efficiency. That's a pretty good green growth scenario.

Kind of embarrassingly, this model showed that, *even with these policies*, by 2050 we'd be looking at... 132 *billion* tonnes of material, every year.

That's *miles* above the safe limit of 50 billion.

\*

So...Green Growth doesn't really work. Which isn't great news. The question I'm left with, is why are we pursuing it then?

Well. It strikes me that our logic is, quite simply, that *it's our only choice*.

Because ... if we *don't* try Green Growth, if we *don't* fix the engine whilst the plane is in the air...then our only other option, according to the pilots, is to crash and burn.

What's the crash and burn scenario? No economic growth. We stop growing. And without GDP steadily increasing each year, things vital to the running of society will plateau, or drop...wages, employment, public services, government spending, national security, social initiatives. We stop progressing, even slide backwards. And that's a terrifying prospect.

"Without growth, society will collapse". That's the thing isn't it, the core belief at the centre of the story, that's our protagonist's motivation for their goal. Growth *must* strive on, because otherwise everything will go to hell.

But of course, when we're looking for faulty thinking - reviewing our tightly gripped to narratives - we've got to check *all* of our assumptions. Especially those ones with fear attached to them, like for Dan, the ones that feel like life or death.

And the central assumption underlying our economic model is that GDP is synonymous with well-being.

And without our well-being will plummet.

So, let's double check that. Time for one more economist.

**Peter** Let me try turning mine off because I can get some things from your facial expressions such as, would he please stop talking now he said enough on this point or whatever. Uh, is that all right, then you'll have to turn you off as well.

**Tilly** That's fine!

This is Peter Victor, I know he sounds English, but he's lived in Canada for most of his life, and if there is a Canadian out there who defies the cliché about Canadians being lovely, Peter is not that man. He is lovely. He *cares* about people's well-being. And he doesn't think growth is a good way to ensure it.

**Peter** I do just want to say one thing... normally I stay away from anecdotes but, one of the graphs that I use in my presentations shows from 1945 to about 2015 in the US two things, GDP per capita, and the percentage of Americans who described themselves as 'very happy'. And what's happened is that since 1970 GDP per capita has risen steadily, maybe there's a declining rate of increase with some ups

and down, but there's a, it's just been going up overall. Whereas the percentage of Americans who described themselves as very happy has if anything declined. It's dramatic to see that.

It's dramatic because it's not what we expect. When our economy grows, it often creates conditions in society in which we get more of the things we want and our well-being is increased. In order to measure that, we just measure growth: *GDP*. The assumption here is that they are synonymous. Growth *is* wellbeing. And if that's the case, it makes sense to protect it at all costs.

But something that is starting to become very apparent to Peter, is that *they are not synonymous*...at best, it's a rough proxy.

Ok - to demonstrate what he means, I'll pose the same question that he posed to me: if growth = well-being that means that it can only be a good thing for us when our economy grows no matter *how* it grows, right?

Say, we sell the NHS - privatise healthcare so that we all have to pay for our heart attacks and C-sections, - that would be great for the economy, think of all that extra money floating around, but would we be better off? Or how about transforming all of our national parks into logging mines for IKEA furniture, again - it would be a boost, but what about wellbeing?

Peter says this is what Herman calls "Illth" instead of "Wealth". And it's not taken into account in our current economic model.

And the other side of the coin is that using GDP as our well being metric, means that anything that doesn't have a price isn't valuable. Things like: the care parents' provide their children and elderly relatives, the benefits of clean air, *lower inequality* even - things any idiot can tell you are *vital* for well-being...and they're not counted.

It can't be overstated: *GDP only measures the size of a nation's economy*. That's *it*. It's a proxy for progress, and not even a very good one.

**Peter** ...Actually I often will describe what I do as storytelling, we are telling stories and I think, if you're telling stories, but not realizing it, then that could be very, very dangerous, and I think that is one of the aspects of economic growth...

Peter questioned this stuff, perhaps, because he's under no illusions that economics is a perfect science. In fact, conveniently for this episode, he calls himself a storyteller, and he feels it's his duty, as an economist, to try and write a new story - one that makes more sense.

**Peter** So just to try to influence the public discussion and debate about what our options are, but, you know, um, uh, it was Margaret Thatcher who made famous the Tina principle, Tina T I N A, there is no alternative. You're not heard that? Oh yeah...there is no alternative. She told us there's no alternative. Well, that's the most mind numbing notion that you can have about, about the future.

Our two economists, Peter and Tim, actually know each other. They got in touch - when Peter was over in the UK - and decided to go for a drink. Peter jokes it's just because both had 'without growth' in the title of their books. And it was over this drink that, inevitably, they got to talking about an idea that had obsessed them both: what would happen if we *just* focused on things that actually increased our well-being. If we left growth out of the equation, if we got rid of the middleman?

So, being economists - they decided to design a *model*. And in this model, they devised a *new measure for progress*: the "Sustainable Prosperity Index", the SPI. The SPI doesn't totally get rid of GDP but it just takes other things into account as well. All of Herman's illths: unemployment, environmental impact, inequality - stuff that isn't accounted for currently. And this way, the SPI gives us a much more accurate picture of how our economy is *actually* serving us.

And growth? That's sort of by the by. It's not treated as a *bad* thing, because it's not. It's just not the *focus* of the story. Remember how the other economists treated Herman Daly? 'Benign neglect'. I'd say that Tim and Peter treat growth with benign neglect. It's not the *point* anymore.

So, they put all the relevant data into their model, and ran three scenarios. Scenario number one was 'business as usual', we keep going as we're going.

**Peter** Uh, we put all those together in an index and that continuation of past trends look awful. That's a disaster scenario. Um, then we look at a second scenario where we say, okay, let's suppose we go really hard after greenhouse gas emissions/carbon emissions: we have a high and rising carbon tax. We go into renewables and electric power sector. So we have a lot of activity in the, every other sector as well. And so on. Um, well that's better, that's certainly a better

future, but it's still a deterioration from the present because we're not paying attention to inequality and indebtedness and unemployment.

That scenario is essentially green growth. Trying to chase growth in a green way. It'll be *better* than our current disaster model, but still ultimately lead to our decline. It's a sticking plaster on a bullet wound.

**Peter** Um, so then we have our sustainable prosperity scenario where we do have programs, initiatives, if you like for all of these things. And, um, eventually the economy stops growing and things look a lot, a lot better because they're scoring good points on all these other things.

And then you have the third scenario. Where we focus on what is needed for us: e.g. lower inequality, healthy environment, low unemployment - that stuff. And *eventually* - because we're not chasing it at the *expense* of our wellbeing- growth kind of plateaus. But the plane doesn't crash...it comes down to *land* safely. Because what Tim and Peter have demonstrated is that if you treat growth with benign neglect and actually focus on things society needs to be happy and healthy?

Then bingo: we start to see an economy which makes sense.

**Peter** Um, because I think if we can show that we can manage quite well without growth in GDP, and by that, I mean, reduce the impact on the biosphere. There have a more equal society, have full employment. And so on, then it went back to storytelling. Then we have a different story that we can tell, and if enough people find it an attractive story, then it's a story that we can make happen.

According to Tim and Peter's model, we *can* land the plane. We just need to redesign our economics a little, which shouldn't be a wild suggestion - after all that's what it's therefore. To serve *us*. To help us design a happy and healthy society.

Here's the thing: if you believe, without a doubt, that when you walk over a bridge you will be terrified...And if you believe, without a doubt, that without economic growth our society will collapse...then you're stuck. You can't move forward. You become the victim of your own self-imposed limitations because you're *so certain* you don't *check* them to make sure that they're correct.

But, as Derren demonstrated to Dan - if you realise that it might be a *narrative* you've had an active role in building - then you know it's at least worth *checking* your underlying assumptions, seeing whether it can be updated, improved, re-written in a way that might take you in a different direction. And that gives you power.

Peter's right: to believe that 'there is no alternative' is one of the most unhelpful, mind-numbing beliefs you can have about the future. This is why he, along with economists like Tim and Herman are still fighting so hard to get their work heard. To show us that economics is a way of designing our economy and it should *serve* us - and if it's not working, it should *be re-designed*. They want to show us that *there is an alternative*.

They're not the only ones.

Kate Raworth has her own story to tell.

Despite having emerged from Oxford University, deep within the heart of traditional economics, she's referred to as a 'renegade economist' - that's because she's saying something different than her peers.

But she's certainly on the same page as the people in *this* episode. Like Donella Meadows, she's used *systems thinking* to develop a new model; and, like Tim and Peter, she's designed a *new progress indicator* to replace GDP, one that centres human and ecological well-being and ignores growth. It's so persuasive that Amsterdam has started trialling it as *their* economic model.

Not only that, but Kate is committed to making her ideas *accessible*. Not boring and opaque - something beyond our remit. No, her book is written to be *understood*. It's where I found the plane analogy, and it's full of other great examples of storytelling that have made it a *big, big* bestseller. It turns out that people like being able to understand what's going on.

One of the best things about it, though, is the title. *Doughnut Economics*.

Why is it called Doughnut Economics?

Because she drew a diagram with the economy in the centre. And *then* she drew this *biiiiig* circle around it, to represent the world. Finally, the diagram is being seen.



I asked Herman about it. He approves.

\*

You've been listening to *The Water We Swim In*. This episode is dedicated to the life and work of the great mind and consummate gentleman, Herman Daly, who has sadly died since our interview.

Next week, we're going deepen our understanding of the ideology behind economics, discover that we've been robbed of something we didn't even know we owned, and learn about a document that prevented kings from turning poachers into eunuchs.

If you're interested in finding out more about the revolutionary Doughnut Economics, head on over to our website [waterweswimin.co.uk](http://waterweswimin.co.uk) - we have lots of resources there, including links to lots of accessible books - like Peter Victor's new book *Escape from Overshoot*.

If you enjoyed the episode, please rate and review on iTunes. We'd really appreciate it, it makes a big difference.

Producing this episode was me, Tilly Robinson. Co-writing was Matthew Robinson. Mixing by Naked Productions, and original music by Drew McFarlane.

