

Mark Lynas | Science as activism

It's a Long Story

Edwina Throsby: From Sydney Opera House, this is It's a Long Story, a podcast that uncovers the lives and stories behind the ideas.

Mark Lynas: Part of the wider struggle for science is to try to maintain sanity, if you like.

Back in his student days, science writer and journalist Mark Lynas was one of the first and loudest voices of the anti-GMO movement. He wrote some of the most-read articles about genetically modified organisms, led protests, and may or may not have coined the term “Frankenfood”. But then he really looked into the science of GMO, and did a full 180. In a world-famous speech in 2013, Mark retracted his earlier views, and apologised for having destroyed GM crops. He's since worked with smallholder farmers in Asia and Africa who, use GMO to better cope with pests, diseases and droughts. He is still an activist, but now he forefronts science in his activism.

Mark Lynas, welcome to the Sydney Opera House.

ML: Thank you. It's amazing to be here.

ET: I want to talk about a whole a lot of things with you today, including your journey as an activist. But I'm interested to find out right back in the beginning, were you born into a family with a strong sense of environmentalism or social justice? What was your family of origin like?

ML: Yes, I was, but it was in some ways the journey that we all went on together. So I'm quite old now. I was born in 1973. My dad was working as a geologist. So, I was born in Fiji, not that far away from here. I grew up in Peru. We're there for three years since my dad was doing geological mapping work. And one of my earliest environmental memories was travelling to a Peruvian town up in the highlands called La Oroya where all of the surrounding hillsides are just dead, because it's a mining town and the, the river there runs this peculiar lurid shade, it was red or green. I remember just this feeling, the strange feeling of, my God, what are we doing to the environment the leaden weight of this pollution. My dad was one of the earliest sort of organic proponents in the UK. This was way back in the '80s when—before the movement became really big and went off to farm organically in Wales where they still live. He's actually become sort of critical of the organic movement as have I for various different reasons about science and so on. But yeah, I've been really privileged actually to have parents and family generally who feel similarly.

ET: Was it on that morning on the Peruvian mountainside when you were a child and you saw the environmental degradation, did your childish mind sort of take it to human intervention, or how did you interpret it?

ML: Yeah, it was obvious because there was a smokestack from the mines in the town. So yeah, the cause and effect were very clear. More so than they are for something like climate change. But, you know, lots of us in that sort of environmental generation moved up from, you know, the very obvious local pollution from traffic or from mines or whatever and, you know, cutting down of trees in your local neighbourhood to sort of global concern about global biodiversity loss or global warming in fact. And so, that's been kind of the journey that— well, sort of the journey of our whole species really is that we've been having lots of local impacts and now humanity is transforming to global force mostly in terms of environment negative.

ET: Was your mother a scientist as well?

ML: No. My mother started off as doing teaching work and she mostly raised the kids to be honest. Although, they then swapped gender roles interestingly when we moved to Spain when I was in the age of 14, my mother then became the main breadwinner and she went off to be director at a language school in Palma de Mallorca. So this was in Mallorca in Spain. She's interested in science but they're kind of opposites. That's why they work, they a very strong marriage because they're such different people but they're so close.

ET: In what ways?

ML: My dad is geologist so he's always bringing about the old vision or the Precambrian era or whatever. And my mum thought all rocks are grey except those around where she grew up in Bradford which are black because of the air pollution, you know, so you can see there's a contrast in their personality.

ET: You moved around an awful lot as a child and teenager living in places all around the world. What do you think that did for your sense of the world?

ML: In some ways—So I had quite a peripatetic upbringing. And yes, so I suppose I had a fairly global mindset from early on. I mean, I still look back on Peru where I was between the ages of about six and nine as sort of my true country. I knew more about succession of all the different Inca rulers than I did about the kings and queens of England. And it's such a fabulous fascinating country, it's got the desert and the beautiful glaciated mountains, and then the jungles, well, the Amazon rainforest. So it retains a special place in my heart. But at the same time I've always been a bit envious of people who are very rooted and they've grown up in a small community where they've known everybody all their lives. That's the one thing if you belong to a place because you're born there and you grew up there than your places were. A lot of my fellow activists were quite like that. I mean, they're a bit different in some way. And it became an identity of itself actually. So certainly when I left the university and became almost a full-time environmental activist, it

was a subculture, it was movement, it was something that we live and breathe. For many people, everyone they knew was also an activist. And it was a label that you wore proudly and informed all of your eating, your living, your political opinions and everything else. So I wonder whether that pushed me into it a bit but I wasn't comfortable there either. I didn't have the mantle of a crusty activist as 100% of my identity. I was more ambitious perhaps to make something of myself as a writer or a journalist or something as well.

ET: How did you get involved in the first place?

ML: This was the time of the road protest in the UK and it was very easy to get sort of into that because—

ET: For an Australian audience, what was that?

ML: Yeah. So what was happening was that the government had a huge roads programme and a lot of these were big bypasses and motorways and things, which were cutting through what's left of our native ancient woodlands if you like. So you've got the guys with the yellow suits and chainsaws going and chopping down beautiful old trees. And so, the activist people mobilised—I mean the activists almost came into being as a result of that roads programme and built treehouses and dark tunnels and just lived and mobilised on these sites. And again, you then get evicted and there would be all of this conflict going on. And so that was the—that was my sort of birth in the activist movement was doing that, going up treehouses and things like that.

ET: What is it that brought you in to the anti-GMO movement?

ML: I think it meshed with my world view at the time, which was that the sort of juggernaut of modernity was damaging—well, destroying everything that I and we held dear. And you could see that was with roads, the tarmac where the trees were chopped down and this tarmac was laid over where they'd grown. And with GMOs, it seemed to be similar that there was these new biotech seeds with transplanted DNA and that they were, going to be in a farmer's fields and all of that Monsanto name I had at the time could sell more of its chemicals and farmers were having to a commercialization of life itself. It's partly that and it's partly the reality of environmental destruction, which is happening because we've got this huge well population and everyone consuming more and more and all that kind of stuff. And it seemed to be pushing agriculture in exactly the wrong direction where there'd be more dependents on chemicals, more monoculture. It was industrial agriculture gone mad. It did end up appealing to a lot of conservative people with a big C. Prince Charles famously said in about 1997 that genetic engineering took humankind into realms that belong to God alone. The Daily Mail, our very conservative reactionary tabloid, have this whole Frankenfood's company, which it maintains pretty much to this day. And I remember feeling a bit nervous about that because I was not and am not a conservative person. I'm a very strongly and progressive of thinking myself as on the centre left now – was probably on the harder left back then. This idea actually that you should stop science and that

progress is a bad thing. So, there's a lot more going on here than just specific to the science.

[MUSIC]

ET: Back in those full activist days, what were you actually doing to protest against GMO?

ML: Well, one of the most obvious things that we're doing was destroying them. And from about 1996, '97 onwards, we took it in turns and took it upon ourselves the small groups, load ourselves into a van, drive off to the GMO test site wherever it was and destroy it. Chop it down with machetes and cutting tools based— I mean, I remember destroying sugar beet with spades and just chopping the tops of all of them and once in maize fields in the nighttime just slashing all them down with a machete. Actually that time, I tell the story in the book, the police came and busted us. And there was, you know, police dogs everywhere and flashing lights and I escaped by the skin of my teeth but several other people didn't.

ET: How did it feel to do that?

ML: It felt valiant, I think. When I look at these crops, I didn't see a nice healthy maize plant. I saw some kind of living pollution and something monstrous almost, you know, you can see that in the Frankenfood's idea. But that's how we felt about it, that these crops were abhorrent and they need to be got rid of.

ET: And the evidence for their existence needed to be destroyed as well.

ML: Yeah. I mean, they were experimental crops, they weren't commercial crops. We were destroying the scientific experiments, which were intended to establish, whether they work or whether they were good or bad. I didn't think we were interested in the results of experiments. We didn't think that should be undertaken at all and we were trying to stop the whole march of science. At the time I think some of the scientist said this was akin to burning books because we actually didn't want human knowledge to increase in this area, because knowledge equals power in that sense. We were also against animal cloning, which is why I was one of a small group that tried to steal Dolly the sheep at the Roslyn Institute, and failed, sadly, in that enterprise. A lot of people were against reproductive technologies which are now completely commonplace like IVF. Because they thought it would lead to human cloning and there was a kind of slippery slope argument as well that once we start getting access to certain technologies, it may be good to start with but ultimately they'll lead to some kind of dystopian future.

ET: And then you had your very famous 180. Can you describe the events that led up to that recantation?

ML: Well, it's quite a long story. So, I know this is a podcast but we have all the time in the world. But like all of these things, that was partly, the reassessment of the evidence. So yes, I look at the science and I realise the science didn't support anti-GMO beliefs that I have. But there was also something deeper going on which was

a shift in my own personal identification from being an environmental activist to being somebody who was working with the scientific community. And that didn't come about through my moving into genetics or molecular biology. It was because I was writing books on climate change, which was an easy transition to make as an environmentalist. Because, obviously, we're all concerned about climate change and by and large the environmental movements got the science right there. So there's no conflict. And I went off and I wrote a couple of books and I spent years in my life in this in the peer-reviewed science and I found that was something that I loved almost more than activism was science. This sense of wonder and the majesty, it's a natural world to be able to have numbers to put to things. I would also find that I was involved in the political debates about climate change and I would try to explain that the science was— how strong the science was, how many different lines of evidence I've worked to defend climate change from the attacks of people who were denying it. And also, the issue of consensus, you know? There's such an overwhelming weight of scientific evidence and one which is supported by every academic institution in the world and sort of— anyway, to cut the long story short, the dilemma I was in was that I couldn't defend the consensus, scientific consensus on climate change and deny an equivalently strong scientific consensus on at least the safety of GMOs, never mind the political and economic stuff. So, you know, you've got people going around saying they cause autism or cancer or they're bad for health. And those are the main, to be honest, the main rabble-raising techniques that there are and that's scientifically indefensible. And I felt like, well, it had to stop and certainly I didn't want to be part of it.

ET: You liken it to the anti-vaccination movement.

ML: It's very similar to the anti-vaccination movement, because the pitch is the same that the experts are involved in some kind of conspiracy. That it's harming our health, it's harming our children, and don't listen to the medics, listen to what you see on Facebook, you know? This is the age of this sort of algorithm-based world view where people live in bubbles. And it's also, I think, have to do with the rise of populism. I don't want to get on to Donald Trump and the rest of it but there is clearly some kind of modern phenomenon of anti-elitist sentiment, which I think has led to a corrosion of trust in institutions and academic scientific institutions as well.

ET: I mean it's an amazing thing when science itself has being— is being questioned when something that is sort of build home principles of intellectual rigour and research and peer review. So, lots and lots and lots and lots and lots and lots of people have to agree, is being in a tough question for validity. I'm not quite sure what that says about it as a culture and—

ML: Well, it's a conspiracy theory, essentially. And it's the same for GMOs, it's the same for climate sceptics, it's the same for anti-vaccination people. They assert there is a conspiracy to fake data on the part of thousands of bona fide scientists. And it sounds absurd but then conspiracy theories are absurd, you know? It's absurd to believe that, well, that JFK was assassinated by a grand conspiracy rather

than a lone nut who happened to be up in the book depository. And the same about whether aliens build the pyramids and so and so forth. The sheer lack of evidence for conspiracy theories is what oddly and ironically makes them so appealing to people.

ET: I think it fuels them too because you can't disapprove something that you can't prove in the first place.

ML: Yeah. Well, I mean, it provides a mechanism. People look for cause and effect, you know? That's how evolutionary heritage. And people look for meaning. You can see that with JFK actually. It's more meaningful if it's some grand conspiracy involving the deep state than if there's some lone nut who happened to kill such an important person. And so, I think the question— meaning of the question wider understanding lead people to believe in conspiracy theories because then they believe they've got a privileged insight with something which is really going on in the world.

[MUSIC]

ET: So you had a massive backlash when you delivered your famous speech. I mean, in a way we've just been discussing the public backlash. What were the worst of the accusations that were levelled at you after that recantation speech?

ML: I suppose the worst would be that I was in the pay of Monsanto all of a sudden and that— you know, because the accusation in this—you're completely corrupt and that you've just done something for the money. And there was no— of course, it wasn't true. So there was no evidence for it. But if you have enough people writing this on the web these days and it can become something which, you know, if somebody Googles your name, then that might come up in the top results. So there was a smear campaign against me and there had been something in the Guardian and other places. But to be honest, I'm not complaining about it because I think I knew what I was getting into. And that's why it took me so long to make our mind up to even do this. I mean I started having doubts and even wrote hesitantly for a few places from as early as about 2008. And I didn't make a speech until 2013, precisely because— and my wife did warn me about this. She just said if you go ahead, this is going to consume years of your life. And of course that's exactly what happened five years later, I'm still talking about it. I'm not going to complain because in some ways I feel privileged to have been given opportunity to influence the global debate on something. You can't just pick and choose a subject. You know, if I wanted to save the Great Barrier Reef, I've got no added value there. There's nothing I can particularly do. But in this issue, I've got this history, I've got the story, and it's something which attracts attention. So I felt I might use it to try and do some good.

ET: How about your personal relationships? How are they affected by this?

ML: Well, I mean, in the outset, I mean there was people who I was very close to who even signed a statement against me because I was living in the same town in

Oxford. There were people who wouldn't talk to me at parties or would pin my wife in a corner and say, "What's Mark doing, what's he is up to now?" and this kind of this stuff. I wouldn't pretend it was easy but at the same time I'm not going to play the victim about it.

ET: Did you lose friendships?

ML: Yeah, yeah. I mean even my best man at my wedding, we didn't talk for about 10 years. I mean there was other stuff going on because we have different world views. He's a deep ecologist moving into sort of eco-modernist phase or something but, that was one of the factors. But now, we're friends again and we see each other a lot and that's the case with most of them. So I went back and interviewed people in the book who, who I'd fallen out with. Because actually he wanted to try and get a bit deeper into this issue and try to figure out what the motivations are.

ET: What would those conversations like with old friends who— from the environmental movement who had sort of rejected you after this and then you approached them to say can I talk to you about this book that I'm writing that outlines all of the views that you hate?

ML: Well, I was grateful actually that they agreed to talk to me at all. I mean, in particular I've mentioned Jim Thomas who's the Greenpeace person who first influenced me back in 1996. He's still working at a group called the ETC group, which is still campaigning against rising criticisms of new technologies whether it's nanotechnology or even block chain. And certainly, there are still very much against genetic engineering. So he was a good person to talk to. And we had what I thought and felt was actually quite a really interesting conversation, which I repeat almost verbatim in the book. Because, you know, he's somebody who is trying to do his best to make the world a better place and he doesn't believe that a lot of the technological innovations are going to make the humanity better. And I think that's a real debate to have. So I don't want to marginalise and exclude people who continue to disagree with me from these debates with the exception, I would say, of people who got something to sell, so— the whole snake oil camp, the anti-vaxxers and people who were genuinely doing really serious harm. And there's some GMO groups in developing countries – I don't know if you want a comment on this or not – in Africa who are spreading myth about gay genes and things like that stop farmers— some of the poorest farmers in the world being able to have access to better seeds which could help feed their family. So that I will fight, but I think there is a real debate that we had and it's good to hear people's views reflected on a state.

ET: And this is something interesting that comes out of your book is that, you know, typically, the villain in the GMO debate has been Monsanto. And, you know, I think that Monsanto did some things that can be genuinely criticised in relation to the development of GMO, the seeds that —

ML: Yeah, the Roundup Ready, yeah.

ET: Exactly.

ML: Actually, if you're going to— yeah, you're going to see seeds only.

ET: The seeds that sort of don't work after a particular period.

ML: You see, that's a myth.

ET: Oh, was it?

ML: That's a myth that they become very associated with that's why I let you finish that sentence—

ET: How interesting!

ML: — because I wanted to see if you were going to say that. What happened was that there was thing called terminated technology, the idea that seeds wouldn't been reproduced.

ET: Actually you do write about this in your book. Sorry.

ML: It was in development and Monsanto took over the company, a cotton company called Dalto and Pineland that was developing it. But then the activists found out there's a huge furore that this was a way that the corporations are going to steal the reproductive capacity of seeds. Actually, one of the reasons it was developed was to stop contamination.

ET: Right, because it was developed but then it wasn't marketed.

ML: Well, it was developed in the lab but it never— it was never out there in the environment.

ET: So getting back to Monsanto and the kind of role of big corporations, you know, you actively defend Monsanto in your book in a way that that is quite, you know, quite strident.

ML: I don't know whether I defend them. I actually talk a lot about some of the damaging things they've done in the past like manufacturing Agent Orange and PCPs and things, but they tend to be earlier than the GMO issue. So no, Monsanto is the elephant in the room. I mean, you can't talk about GMOs without Monsanto coming up. And when I was changing my mind on GMOs, people would say you've been taking money from Monsanto. So I had to discuss it. But it's actually a huge and a very fascinating untold story about who Monsanto is and what they did and how GMO seeds came about in the first place. And I actually felt it was an amazing thing for people to find out more about, simply because it's become so misunderstood and so mythologized.

ET: In your book when you go to a lot of places around Africa and you trace the sources of the movements against GMO crops and the propagation of ideas about, the fact that they're going to turn everybody homosexual to control the birth rate in

Africa and those sorts of homophobic stories, you trace them back to really unlikely sources.

ML: Well, yeah. I mean, the groups who are involved in spreading myths on gay genes and stuff like that tend to be funded by European sources. So even in the European Union, I mean you can see this with the golden rice which is another— I don't go dwell too much on that in the book because it's quite a well-known story. But for anyone who doesn't know, this is Vitamin A carrying rice which has been developed in order to address Vitamin A deficiency in young children in Asia in particular. And the golden rice trials were destroyed and have been attacked furiously. The whole idea of golden rice has been attacked furiously by NGOs which turned out were funded by the government of Sweden, you know, and I just—

ET: What was the interest there?

ML: Well, because they believe and, you know, they kind of have a sort of belief in agroecology and organics and, you know, this kind of thing has become very almost hegemonic and sort of good liberal thinking of people who control aid budgets. They don't realise that what they are doing actually is promotion to continuation of poverty by stopping improvements in agriculture.

ET: It's a sort of interesting thing between the idea of natural and unnatural ride comes at the cause of this.

ML: But that's the foundation and that unit is called the naturalistic fallacy by scientists because that's actually what underlies the whole organic movement. The idea that natural is good and synthetic is bad, so they can— you know, the artificial is bad and that the natural is good. There's no scientific underpinning to that you can have the same molecule which is derived synthetically or comes from a natural source and it's going to have the same effect, right, the same molecule but it's considered differently in the organic industry. And you can see this even with pesticides. So you can have pyrethrum which is pesticide that's derived from chrysanthemum flowers and that's an approved organic insecticide in fact is very potent. But you can have a pyrethroid which is a synthetically derived equivalent molecule and that's banned because it's a synthetic pesticide, right? What's the difference? Well, they're probably the same. And so, whether it's natural or not, it doesn't tell you anything about the toxicity or anything which really matters in the real world. And so that's what bugs me about all organic thing.

ET: And we know that that Greenpeace is about to adjust this on GMOs and other environmental parties around the world are reconsidering policy and stuff. How about organic movements?

ML: Well, I think organic will be the last change on this. Yeah, it's greatly Greenpeace is sort of exiting from the anti-GMO fight. And I think they're doing so for the right reasons because they want to be on the right side of science on all the issues they work on which is admirable. Organic has a different problem though,

because the concept is flawed. Like I said, if it's based on a fallacy that natural is better than artificial, then it's not a science-based concept, what you need to know actually is whether something is ecologically better, whether it's toxic or nontoxic and those are things which science can address. Whether a natural or not is not the issue. E. coli can be natural and can kill you, you know? Ebola is a natural phenomenon and that can kill you too. So you know, like I said, you need to know first sustainable agriculture whether something is environmentally better. And organic tends not to be because it has much, much lower yield. So if you're going to try and feed the world organically, we have to lose half the world's population or plow out all of the rainforest, and in what way is that environmental?

[MUSIC]

ET: as well as GMO, the big thing that you've done most of your life's work really around is climate change. And before we end, I guess I'd like to think about the way that climate change is sitting politically around the world at the moment. We're in Australia at the moment and our government has among its prominent members, people that question the idea that climate change is caused by human behavior. What do you think about those sorts of politics at the top level?

ML: Yeah, Australia is second only to the US in terms of the peculiar polarisation of the climate change debate. I mean, you can see this with Tony Abbott's latest salvo to try and destroy the Paris Agreement. I mean, the only other person who's done that is Donald Trump. And this has happened before, it happened with Bush as well, with I think it was John Howard who had the similar climate sceptic approach. And I don't know why it is that you have this but it's this— this left-right polarisation on the climate debate I think is very destructive. What should happen is the all parties should accept the reality of the science and they should put forth proposals to tackle climate change which are compatible with their ideologies and different political approaches, which is fine. You don't have to tackle this in the way that the greens want to, right? And I've actually said the same with nuclear power, I'm pro-nuclear. So I want to tackle this in a way which most conservatives are very comfortable with. Why can't we use a low-carbon power source? You know, we can have all the nuclear debates but the conservatives aren't generally supportive of nuclear. It's low-carbon, so let's accept climate science and that could be your way forward. I'm just sort of speculating here. But the problem, what tends to have happened is the sort of climate narrative has become sort of wholly owned by morally self-righteous greens, and that really pisses off the conservatives. And their reaction to that is quite childish and juvenile, which is to deny the existence of the problem to start with. And that process has really reached its apogee in the US where you've got the Republicans where climate change denial is now an article of faith for the entire party right at the top level of the president. And then you've got the Democrats who are then proposing all sorts of left-wing type approaches and the whole process just goes on. And it's happening here in Australia too, which I think is dangerous and damaging. I would like to not see the same thing that happening with GMOs. Let's try and keep the basic science away from the different political approaches.

ET: You said just now that one of the problems with green movements potentially at the moment is that they've become very rigid and quite self-righteous. Where do you think green activism is now? And how do you see environmental activism as evolving to be effective?

ML: Well, the problem with moral self-righteousness is that it's a dead end. Not only is it off-putting to wider society, I'm just sitting here in Sydney, I flew to Sydney from the UK and the carbon output of that is probably accountable in the tonnes, you know, it's like three or four tonnes. And I know a lot of people who are climate activists who would not do that. And they would say to me, how do you go to sleep to— at night, knowing that you're responsible for several tonnes of additional carbon pollution? But where do you take that argument? In that case, you never drive a car, you shouldn't even have kids by the way, you should never eat anything. And all of a sudden, you can't continue being a human being in any kind of civilised way. So nobody can be morally pure. And actually, the moral purity demand is a dead end and so you have to address this in ways which are more political, and which deliver what people want, which is energy. Whether it's heat or cooling or, you know, transportation, moving you around, bringing you food, whatever it happens to be without destroying the Earth ecology. And to do that, we're going to need all the best tools we've got, which includes modern technologies like nuclear power and even GMOs, God forbid. But it's not only those things. Those are two quite small parts of a much wider challenge. So, in fact, we invented this philosophy called ecomodernism, which was an attempt at least to bring this out into the open, the challenge that you have with more mainstream environmentalism, whether it's refusal ready to engage in, you know, the realities of wider society.

ET: Yeah. So tell me about ecomodernism.

>> Well, there's actually a manifesto called the Ecomodernist Manifesto, but it was about the need to remove the scourge of extreme poverty. We need to continue economic development, but we also need to recognise that the Earth's capacity to absorb ecological shocks is limited, whereas those tend to be the opposite ends of different debates normally. So let's see if we can figure out ways where you can be progressive and you can be environmentalist and you can be pro-technology.

ET: I mean, that's a pragmatic approach really.

ML: Yeah, I suppose but, you know, everyone thinks they're pragmatic.

ET: True. You've spent your career really— you've spent your career grappling with the very, very big problems of the world. And you've had a poke at quite large solutions. If you could boil all of it down into some sort of credo, what do you think it would be?

ML: I believe in progress. I believe that we should get rid of high rates of infant mortality. We should help countries emerge from poverty. We should feed the 800 million people who are going to bed hungry each night. And at the same time, we

should tackle climate change and try and protect the Earth from further ecological harm for the benefits of not just future human generations but the rest of life on Earth.

ET: Pretty good list. Where do we start?

ML: I don't know. We need to give it a name.

ET: But where do we start?

ML: You can't do them in order. You actually have to do them simultaneously and try to figure out multiple winds, really because, you know, there's ways in which they are difficult to reconcile, if you reduce poverty, then you're increasing consumption, and then you're increasing material resource use in the developing world. Therefore, you're increasing ecological impact. But what's the corollary of that? You protect poverty and also stop poor people from becoming as rich as we are and consuming like we do. I mean, that's morally and politically unsustainable. So we have to find a different way to solve the problem.

ET: Having come from a background of collective action, it can be challenging to look at what ways individuals can bring to what is essentially a political struggle like this. Do you have any advice for people about how they can adjust or think about the ways they live that might have some sort of impact for good?

ML: Yeah. Well, I'm quite sceptical of green consumerism. There's a lot of, I think, divisively called 'virtue signalling' out there. And yes, you know, your personal choices in terms of transport and diet and things. I'm actually a big advocate of veganism despite not being a vegan myself, well, not all time.

ET: I have huge admiration for my vegan friends.

ML: Yeah, I actually want to have a vegan offsetting programme where I pay other people to be vegan while I continue to enjoy the odd steak. Collective action requires politics. That's what politics is, is the way that society collectively addresses issues. Whether it's street lighting or, you know, garbage collection or climate change. It's the same thing, you've gotta have politics. And so, that's what matters. And what scares me most about the world today is the way that politics is going wrong with populist movements, with attacks on immigrants and demoralising of people who are different, and the way that seems like the institutions have democracy itself and they want to attack. And so, I see this as part of the why the struggle for science as well is to try to maintain sanity, if you like. Democracy needs to be fought for. It's something that I've always taken for granted when I was younger. I could be an anarchist because parliament would always be there. Now, parliament itself seems to be under attack. And actually, I think it's time to defend it.

ET: So where do you find hope?

ML: I find I'm actually quite cautiously optimistic. Because I'm a historian as well and if I think if I had been born in, I don't know, in 1900— no, perhaps a bit earlier,

maybe say, 1885, I would have been sent off to the battlefield in the First World War and I would almost certainly have been killed because most young men were. Would that have been a more optimistic time to have been born than we are today? I don't think so. So we've got everything to still fight for. We're going to get a warmer world but it doesn't have to destroy human civilisation and we can still save most of the species. And so let's go out there and let's try and do that.

ET: Well Mark Lynas, on that vaguely hopeful note thank you very much for coming on *It's a Long Story*.

ML: Thank you. It's been a pleasure.