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Sustainable Human Development

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"No Good Choices Left": Our Dilemma Under a White Sky

—Techno-fixes won't circumvent the need to change our lifestyles

Elizabeth Kolbert – Olaf Bruns

After her Pulitzer-winning The Sixth Extinction, Elizabeth Kolbert's new book, Under a White Sky, describes the world of "techno-fixes" to the damage we have inflicted on nature. Today, the world faces the dilemma that even the most well-intentioned interventions risk making matters worse, though we may no longer have the luxury of refusing them. In a century that will be shaped by the climate crisis, learning to navigate humanity's "mixture of hubris and cluelessness" when dealing with nature will be essential.

Olaf Bruns: Before delving into your new book, Under a White Sky, I'd like to go back to your previous one, The Sixth Extinction, which argued that we're in the midst of a new, man-made wave of species extinction. Seven years later, the climate crisis has certainly entered public perception but does the biodiversity crisis receive appropriate attention?

Elizabeth Kolbert: Clearly not. The problem is that the biodiversity crisis is such a sweeping problem. It involves so many different components of our globalised world. And globalisation itself is a significant driver of extinction, for example by

constantly moving species around the world. Climate change, even though a monumental problem, is only one component of the biodiversity crisis. There are others: changes in land use, fragmentation and destruction of habitats, invasive species, ocean acidification (which is intimately linked to climate change). All these are synergistic. That's why it's so difficult to even identify the problem.

Olaf Bruns: What led you from The Sixth Extinction to Under a White Sky?

Elizabeth Kolbert: After The Sixth Extinction I wondered: where do we go from here? The first part of Under a White Sky, which is about the Super Coral Project, connected to this question. At the centre of the Super Coral Project [which aims to create more resilient coral species by crossbreeding, selection and applying external stress] was the idea of intervening at a very profound level to try to alter nature so that it can survive in the altered world we're creating. I started to see a pattern: where we should reduce emissions, for example, we tend not to even try any more. It's either politically too difficult or simply a humanitarian problem: with a world population of almost eight billion people, you can't simply say, "Let's stop using nitrogen fertiliser." So instead, we try to "fix" the problems. We're in this terrible dilemma where there are simply no good choices left!

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Olaf Bruns: Does the title Under a White Sky point to one of those attempts to "fix" the problems?

Elizabeth Kolbert: It comes from what could be described as the ultimate idea of intervening in nature to counteract previous interventions: the idea of solar geoengineering, that would mimic the temperature-lowering effects of volcanic eruptions by injecting substances into the atmosphere to reflect more sunlight back to space. One of the many possible side effects of this type of geoengineering would be to make the sky whiter.

Olaf Bruns: There's tinkering with the genome of coral and there's geoengineering, with all its unpredictable side effects. Your book also describes the electrification of a canal to prevent artificially introduced fish from entering and wreaking havoc in another ecosystem, and the construction of a 4.5 million dollar replica of the living environment of the Californian desert pupfish to house a "backup population". It gets more surreal with each example! But it's also constantly flipping back and forth between tragedy and comedy.

Elizabeth Kolbert: It surely is black comedy! Obviously, all these things are profoundly tragic: for the species that are going extinct, it is the end of a long history; and of course it is tragic for the many, many people around the world already suffering from the effects of climate change and environmental degradation. But our attitude towards this situation is a sort of bumbling mix of hubris and cluelessness that has a profoundly comic element.

I also wrote it as a dark comedy because often books about environmental disasters come up with some sort of list – "the 10 things you can do about…". I don't really know how we're going to solve this. My book's logic is the opposite: it's supposed to be kind of fun to read. But at the end, the problem is precisely that there are no good answers.

Olaf Bruns: Sometimes the absurdity of your examples depends on perspective. For instance, you describe the levee flood protection system around New Orleans, which essentially counters the fact that humans settled where they shouldn't have because the lands were too instable. They scramble to make the levees higher and higher to counter the rising tides which result from yet another human-made problem: climate change. Looking at this situation as someone who is half Dutch, it suddenly seems much less surreal: it has been that way for centuries in the Netherlands, which are

largely built on land reclaimed from the sea. In the Netherlands, it's hard to think of nature as something that is not human made. Could a more realistic idea of what nature is and how much we've already changed it (intentionally or otherwise) facilitate a more cool-headed debate?

Elizabeth Kolbert: *Yes, probably. Gene editing is a similar example that will bring these issues to a crisis point. We'll be able to gene edit species so that they have better heat tolerance, for instance. With gene drive technology [which helps propel certain mutations through a population], we might even be able to push these traits out into the world. Again, there are no easy answers. Rejecting these technologies as "unnatural" won't bring nature back. The choice isn't between what was and what is, but between what is and what will be, and that might often be nothing. Your natural sense of revulsion, or your ethical horror, will often have to be re-examined considering the situation.*

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For example, the American chestnut tree – a very important species in American hardwood forests – has been decimated by a fungus imported from Asia. You cannot find a mature Chestnut tree anymore. For years, people have been trying to back-breed the tree, without success. Until someone inserted a single gene and a promoter into the American chestnut tree, making it fungus resistant. Currently, various US federal agencies are deciding whether those plants should be allowed out into the world. My first reaction was that would be totally crazy! But after reflection, I changed my mind: once they're approved, I'd plant one of those trees in my backyard. Because unfortunately, we don't have the luxury any more of being as fastidious as we might like to be.

Olaf Bruns: Pushing the previous question to the extreme: do you think romantic misconceptions of what nature is prevail in the environmental movement?

Elizabeth Kolbert: *I don't want to denigrate it as "romantic". But it's true that archaeology increasingly points to profound human impacts on nature, going back farther and farther in time. In the US, unlike in Europe, there still exists a kind of wilderness and a veneration of this, even though, as many have pointed out, all these places were occupied by humans for thousands of years before the colonists arrived. These places all had a human footprint, but it was a small one because there just weren't that many people. So it's wrong to think of these places as primeval nature. But on the other hand, if there's no baseline, if you don't imagine a pre-human nature – or at least one prior to industrialised agriculture – what is it that you're trying to preserve?*

In Europe more than the US, that's a really complicated question. Think of all the programmes in Europe, for example, which continue to involve mowing places because they've been mowed for thousands of years and current ecosystems depend on it. What nature are we talking about? These are tough questions. It starts to become what might be called romanticism when the answer is some kind of return to an agrarian past. That simply isn't happening without complete societal breakdown, which you can't really wish for. Billions of people survive on industrial agriculture today – it's not going away.

There tend to be these camps: one that thinks technology will save us, and another advocating for some return to the past or a step back from technology. Neither will work!

Olaf Bruns: On the flip side: if there is romanticism in the environmental movement, isn't the idea prevalent elsewhere of "repairing the planet" with yet non-existent techno-fixes bordering on magical thinking too?

Elizabeth Kolbert: Indeed, there tend to be these camps: one that thinks technology will save us – that's a very American view – and another advocating for some return to the past or a step back from technology. Neither will work!

Olaf Bruns: You mentioned gene editing. Stratospheric sulphur injections in the earth's atmosphere only seem a small step further. So the ethical question is, given the urgency of climate change and mass extinction, should we do it?

Elizabeth Kolbert: Fortunately, or unfortunately, we don't have to answer this question yet because we don't even know if it would work. Even the most basic applied research is still lacking. Nobody's actively advocating for deployment now. But there are a few who say – and it's not an unimportant argument – if we'll do it one day, we should begin sooner rather than later. Because the aim is to cut the top off the heating risk curve. And when will the top of this curve be? Hopefully, within the next few decades. As carbon emissions reduce, the idea is that there'll be peak warming at some point, and that geoengineering could – theoretically – reduce this peak.

Olaf Bruns: What different types of geoengineering are there? Or, alternatively, what ways are there to get carbon out of the atmosphere?

Elizabeth Kolbert: Over the last couple of decades, these two have been lumped together. But today there's growing consensus that they're different technologies with different effects.

CO2 removal is already moving mainstream because it's baked into any net-zero scheme, which Europe for example has embraced. The question is: what is the "net" in "net zero"? Well, the "net" means that what we continue to put into the air needs to be taken out of it. And there are many ways to do this: there are certain rocks that are not in equilibrium with the atmosphere yet, and they can be ground up to absorb CO2. Then there's biomass, which can be planted, cut down, burned, and the CO2 captured and stored underground. There are chemicals. CO2 can be sucked out of the air.

Geoengineering, on the other hand, consists of attempts to like those manipulate clouds or the stratosphere to produce more reflectivity. With the same aim, there are also proposals to pump water onto ice sheets to stop them melting. Ice sheets are very reflective. If that reflectivity is lost, it begins another feedback loop. The proposals to brighten clouds seem theoretically possible even if they've not yet been demonstrated. Finally, the ultimate idea is shooting reflective material into the stratosphere to reflect sunlight back into space.

Olaf Bruns: You also describe how all scenarios to keep heating below 1.5 degrees put forward by the UN's Intergovernmental Panel on Climate Change include carbon capture or some form of negative emissions, as do most 2-degree scenarios. Is it fair to say that there's no such thing as limiting warming to 1.5, or even 2, degrees without removing CO2 from the atmosphere?

Elizabeth Kolbert: Yes, indeed. Critics of the IPCC would say you only get out the scenarios what you put in. Theoretically, there could be more scenarios that involve radically cutting CO2 emissions, and very fast. What prevents the IPCC from modelling these are the economic and humanitarian implications. They're models, and I don't want to comment on how accurate or inaccurate they are. But yes: in the IPCC special report that looked at a huge number of scenarios for how to limit warming to 1.5 degrees, all of them required negative emissions. The vast majority of scenarios to result in 2 degrees or less also involved negative emissions. And quite significant ones at that.

Olaf Bruns: Environmentalists tend to fear that if we create the means to remove CO2 from the atmosphere, we take the pressure off industry to reduce its emissions. Where do you stand on this debate?

Elizabeth Kolbert: When I started covering climate change almost 20 years ago, there was already talk of "adaption to climate change". Some people didn't even want to talk about this because acknowledging the need for adaptation meant that we weren't doing enough to tackle the problem. Today, that's not a debate anymore. Adaptation is happening on a massive scale because of the changes that have been set in motion. Now you can hear similar arguments related to CO2 removal. That argument is also going to pass because we need to do both: CO2 removal and massively reducing our emissions. It's not either or anymore. If we as a society can't get our heads around that, we won't stand a chance.

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Geoengineering has even more of this hazard argument. But eventually we may well get to a point where that hesitation goes by the boards as we end up needing everything.

Olaf Bruns: But if we do CO2 removal, it will have to be on a scale that's difficult to achieve – difficult even to imagine!

Elizabeth Kolbert: It's a pretty simple calculation: one could argue that our entire industrial infrastructure is a carbon addition infrastructure. All our pipelines, industry, every single car and house – they're all part of this vast apparatus for converting fossilised carbon into CO2 in the atmosphere. To make a dent in that with CO2 removal requires something on the same scale of the entire industrial infrastructure! And all that stuff has to be piped or buried somewhere. It's huge.

Olaf Bruns: And on top of this, it's hugely difficult to finance carbon capture.

Elizabeth Kolbert: Because there's no incentive for it. It's like dumping your garbage for free versus paying. If it's still possible to dump garbage on the street rather than pay for it to be picked up, there'll be a lot of garbage on the street! The current economics don't work. But there's a lot of venture capital today, because of the hope or conviction that one day dumping emissions in the atmosphere won't be free anymore.

Olaf Bruns: So, how to create those incentives?

Elizabeth Kolbert: There are many ways to do it, but it all boils down to some charge or limit on how much CO2 you can emit. Then you might end up paying for the carbon capture to "net out" the CO2 you put up there. Or you could tax carbon, for example – it's not rocket science.

Olaf Bruns: The new US administration has certainly brought change to the American voice on climate. What's your assessment after six months?

Elizabeth Kolbert: Joe Biden has put good people in key positions. They absolutely know what they're doing. But it won't necessarily be heartening when we see all this run up against a sclerotic political system. So far, the administration has done a tremendous amount by an executive order which rolled back a lot of what the Trump administration did. But in terms of making meaningful legislative progress it will be difficult because everything will be litigated and taken to the Supreme Court. It's not really looking good.

Olaf Bruns: US climate envoy John Kerry recently said that Americans would not necessarily have to change their lifestyles because there'll be a techno-fix to all problems. To quote him: "I am told by scientists that 50 per cent of the reductions we have to make to get to net zero will come from technologies that we don't yet have, that's just a reality." Beyond the oxymoron of admitting that we don't yet have these technologies while calling them "a reality", isn't telling people they can continue with their lifestyles in the current situation a case of textbook populism?

Elizabeth Kolbert: What Kerry said played badly in Europe, but in US politics there's a saying: you don't touch our system of retirement payments and social security – the "third rail of US politics" – unless you want to get electrocuted. It would be the same to tell people they have to change their lives: you just never do that! On the very progressive wing of the Democratic party, there's the proposal for the Green New Deal, a very optimistic project that tries to gather a large coalition: organised labour, communities of colour, the whole broad tent of the Democratic party. But nobody says people will have to change the way they live. It's sort of an article of faith in the US. Even people much more progressive than Kerry wouldn't say it. I don't think anyone would be willing to say it, at least not for political purposes.

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- **About the author: Elizabeth Kolbert** is an American journalist and author. Her books include the Pulitzer prize-winning The Sixth Extinction: An Unnatural History (2014) and Under a White Sky (2021). **Olaf Bruns** is trained anthropologist, he has been a journalist in print, online, radio, and television for over 20 years. After 5 years as deputy chief of Euronews' Brussels office, he is now – amongst others – deputy editor-in-chief of the Progressive Post.

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