

Climatic and Other Catastrophes

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A talk presented at "KitcherFest," a workshop in honor of Philip Kitcher, at Columbia University, New York City, November 14-15, 2022.

This is a lightly edited version of the talk as given, with some slides included and a few extra comments in the notes.

Given the peculiarities of our profession, it's not common for philosophical events – the publication of books and the giving of talks – to be infused with historical irony. But we do have an instance of that rare category here, with the publication of Philip Kitcher and Evelyn Fox Keller's climate book, *The Seasons Alter*, and this long-delayed talk about their book.

What do I mean? The book was published in 2017, and written, Kitcher says, before the 2016 US presidential election. The actual writing is by Kitcher, but it was joint work with Keller and published by both.

The book has a preamble, a fictional scenario to set the scene. A leader in the future, 2159, is giving a speech after a series of disasters. Humankind has partially recovered from the following sequence: climate change, then conflict over water, leading to huge disruption and world-wide wars including the use of nuclear weapons.

And then: a pandemic.

Its origin is unclear, probably due to farmed birds, and over 99% of humanity is lost. Without this pandemic, the leader notes, conflict would probably have resumed, especially over water. When Chris Haufe got in touch about this planned conference, I knew I'd want to talk about the climate book – I had not read it, but had been meaning to. That was in November 2019, with the conference to take place in 2020. And here we are now.

It's even more natural now, surely, to pursue the theme of disasters, climatic and otherwise, from Kitcher and Keller's book. I will also talk about science, energy policy, democratic processes, and *trust* – all of them big Kitcher themes over many decades.

The talk will have two substantive parts. First, I'll talk about links between the actual events of last two years and arguments in the early part of the book. Then I'll talk about possible solutions in the area of climate, which Kitcher and Keller cover in the latter part of the book.¹

1. Scientific Incentives, Covid Origins, and Trust

The Seasons Alter is partly in the form of dialogues about climate change, between a sequence of more skeptical voices (all called Joe), and more concerned voices (all called Jo). The first Joe is spelt with an "e" and the second Jo is spelt without one, but this is a phonetically challenging choice of names when giving a talk. I'll distinguish *Concerned Jo* and *Skeptical Joe*.

In the first dialogue, Skeptical-Joe raises doubts about warming itself, and Concerned-Jo gives arguments. A crucial moment in the exchange is one where Concerned-Jo draws on ideas about incentives, power, and the social structure of science. Skeptical-Joe says he's not willing to see scientists as saintly, pure-of-heart figures ("saints in lab coats").

Concerned-Jo replies that scientists are indeed quite self-interested, but in a particular way. We know some of the outlines of what follows from Kitcher's other work (*The Advancement of Science*, 1995), also from David Hull and Robert Merton.

Concerned-Jo relates an anecdote, something she was told by a scientist. The scientist said: "Like most people, you think scientists want the truth. They don't want the truth. They want to be right." Concerned-Jo goes on: "That really puzzled me. I couldn't see the difference. Finally I got it. Scientists don't just want it to happen that the truth emerges. They want to be the ones who find it out and are recognized for doing so."

¹ For discussion and correspondence about the Covid issues, thanks to Zeb Jamrozik and Rob Bezimienny; for the climate issues, thanks to Jonathan Symons.

The exchange continues. If you worry that scientists who find problems with orthodoxy will be too scared to air their concerns, you should not worry. This is because: (i) the rewards of successful challenge are great, and (ii) the establishment does not have so much power that they could shut an unwanted challenge down.

Skeptical-Joe worries that causing trouble is just too risky; if you don't tow the party line, you might get thrown out of science. You shouldn't rock the boat. Concerned-Jo replies: no, the leading climate scientists aren't Mafia bosses. They're not that unscrupulous, and again, they couldn't shut a challenge down, even if they wanted to. There's a whole world waiting to hear about ways in which they might be wrong.

Concerned-Jo continues: If you're a young researcher, looking to make your name, and you think something is wrong with established work, you can show people to be wrong and thereby get a great deal of credit. "Scientists are *really* fond of asking their peers whether they have considered some rival approach." Make your name by exposing the mistakes.

THE SEASONS ALTER: HOW TO SAVE OUR PLANET IN SIX ACTS

wool over everyone's eyes. They want their peers, and maybe a broader public, to see that their ideas are true. They want credit.

And that sort of motivation makes a huge difference to how people act. How do you get a lot of credit? By doing something big and splashy. What better way to do it than by exposing the flaws in some important conclusion that all the rest of your community accepts?

Joe: No, it's too risky. Not toeing the party line would get you thrown out. If you really want credit, you shouldn't rock the boat.

Jo: I think that's dead wrong! First off, the leading climate scientists aren't Mafia bosses. They aren't that unscrupulous, and they don't have that power. And there's a whole big world waiting to welcome anyone who could expose errors in the

orthodox reasoning. ⁵

Remember where our logic-and-science bit left us. Climate scientists have used two sensible strategies. You worried—reasonably—about whether they'd been thorough in pursuing them. What I'm now suggesting is that, if they hadn't, some of their ambitious colleagues would have been *very* eager to show them up. ⁶ If the data behind the graphs were insufficient or if the statistics had been fudged or badly done, that would provide a great opportunity for some young researcher. Make your name by exposing the mistakes. Or showing how some viable alternative explanation of the correlation had been left out. Scientists are *really* fond of asking their peers whether they have considered some rival approach.

The upshot of this pivotal part of the early chapters of the book is the idea that climate science is very difficult, but if we want to know what to believe, we can be reasonably confident that the incentives and power structures of science are working *with* us, not against us.

I think this passage looks different in 2022 from how it looked in 2019. It looks different to me, anyway.

Some of you know that I have been critical of quite a lot of the mainstream approaches to Covid policy, here in the US, in Australia, and over much of the world.² In the US, especially problematic policies included school closures and also vaccine mandates for young people. In Australia, we had excesses of police enforcement of a sort not seen in the US, forcible prevention of protest, and school closures (not quite as destructive ones) as well. I think it's also possible to be critical of how the "lab-leak" hypothesis was handled, critical of attempts to get social media to companies to censor unorthodox voices as misinformation, and so on.

A lot of my dissent in this area depends on larger questions of value – the prioritization of the interests of the young over the old (something I believe in to some extent), the value of basic liberties, a distrust of censorship, and so on. Here, though, the thing I can do that might be most informative is to focus on a purely empirical, scientific matter, one that can be discussed independently of evaluative and policy questions, to a large extent – and anyway *should* have been discussed in that manner. This is the handling of lab-leak versus zoonotic hypotheses about the origin of the outbreak. I think, to put it bluntly, that the way this has been handled shows that we can't have the same level of confidence in those ideas about science that I was just discussing (the ones on the Kitcher & Keller slide above) – a level of confidence that we would certainly like to have, and that we could have, to a significant degree, before.

² My main published paper, "Covid Heterodoxy in Three Layers," in *Monash Bioethics Review*, is here: <https://link.springer.com/article/10.1007/s40592-021-00140-6>. The last of the unpublished versions is longer, with some filling-out of details, anecdotes, and comments about politics: <https://petergodfreysmith.com/wp-content/uploads/2021/10/Covid-Heterodoxy-PGS-v4K.pdf>

More fully, I think things were better somewhat *further* in the past – not just before Covid, but a fair way back. Things have been getting worse over a number of decades, but Covid has made things worse.

I'm going to talk about the handling of the lab-leak hypothesis. Let me first say that I don't believe the lab-leak hypothesis. I'm neutral. It's an open question for me. And there'll be nothing in this talk that bears on the biology of why you might believe or not believe the hypothesis now. It's all going to be based on who said what, at what time. What I don't like is how it was handled.

At the start of the pandemic, US mainstream authorities wondered about the possibility of a lab leak. Later, via freedom of information requests, we learned about a series of emails and conference calls between leading virologists, Tony Fauci, and others. Here's perhaps the most important of the emails that's come out. This is an email from Kristian Andersen, a virologist at the Scripps Institute.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Sat, 1 Feb 2020 18:43:31 +0000
To: Kristian G. Andersen
Subject: RE: FW: Science: Mining coronavirus genomes for clues to the outbreak's origins

Thanks, Kristian. Talk soon on the call.

From: Kristian G. Andersen (b) (6) >
Sent: Friday, January 31, 2020 10:32 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)
Cc: Jeremy Farrar (b) (6) >
Subject: Re: FW: Science: Mining coronavirus genomes for clues to the outbreak's origins

Hi Tony,

Thanks for sharing. Yes, I saw this earlier today and both Eddie and myself are actually quoted in it. It's a great article, but the problem is that our phylogenetic analyses aren't able to answer whether the sequences are unusual at individual residues, except if they are completely off. On a phylogenetic tree the virus looks totally normal and the close clustering with bats suggest that bats serve as the reservoir. The unusual features of the virus make up a really small part of the genome (<0.1%) so one has to look really closely at all the sequences to see that some of the features (potentially) look engineered.

We have a good team lined up to look very critically at this, so we should know much more at the end of the weekend. I should mention that after discussions earlier today, Eddie, Bob, Mike, and myself all find the genome inconsistent with expectations from evolutionary theory. But we have to look at this much more closely and there are still further analyses to be done, so those opinions could still change.

Best,
Kristian

On Fri, Jan 31, 2020 at 18:47 Fauci, Anthony (NIH/NIAID) [E] (b) (6) > wrote:

Jeremy/Kristian:

This just came out today. You may have seen it. If not, it is of interest to the current discussion.

Best,
Tony

Regarding that list of names, "Eddie, Bob, Mike and myself": Eddie Holmes is at my university (Sydney). He's an important virologist who's been central in these discussions. Mike Farzan is also at Scripps.³ Other people in the picture include Francis Collins (the former NIH Director), Tony Fauci, who everyone knows a lot about now, and Jeremy Farrar, who was the head of the Wellcome Trust in the UK.⁴ There was an initial discussion, and then this email, which included the fact that the virologists were concerned. "Eddie, Bob, Mike, and myself all find the genome inconsistent with expectations from evolutionary theory." Andersen, just above that, emphasizes that you don't see this by looking at the total genome; you see it by looking at a couple of little bits of the sequence. The initial concern was in large part due to the presence of a short stretch of the sequence that specifies a structure on the "spike" of the virus that is susceptible to being cut by a particular enzyme, an animal enzyme called furin. So it's referred to as a "furin cleavage site." It's a part of the physical virus that's susceptible to being cut by the host enzyme, furin.

That was the initial focus of some suspicions on the part of these central, mainstream people. Here's another passage from the freedom of information requests. This is now Jeremy Farrar, head of the Wellcome Trust in the UK, summarizing Farzan's concerns: "He is bothered by the furin site and has a hard time (to) explain that as an event outside the lab, though there are possible ways in nature but highly unlikely." Also from Farrar:

"I think this becomes a question of how do you put all this together, whether you believe in this series of coincidences, what you know of the lab in Wuhan, how much could be in nature - accidental release or natural event? I am 70:30 or 60:40."

Later emails showed that by February 4, Sir Jeremy had revised his estimate of a laboratory leak to 50:50, while Professor Eddie Holmes, of the University of Sydney, gave a 60:40 estimate in favour of an accidental release.⁵

³ I am not sure which Bob this is – I think Bob Gary, who is at Tufts.

⁴ BuzzFeed and the *Washington Post* did the FOI request.

<https://www.washingtonpost.com/politics/interactive/2021/tony-fauci-emails/>.

<https://www.documentcloud.org/documents/20793561-leopold-nih-foia-anthony-fauci-emails>

⁵ This is from: <https://www.telegraph.co.uk/news/2022/01/11/scientists-believed-covid-leaked-wuhan-lab-feared-debate-could>

Within a few days, some of the virologists seem to have changed their minds – which is, of course, 100% fine to do. Some of them were coauthors on a *Nature Medicine* paper asserting a natural origin.⁶ This was published in March, after these discussions in February – it was all done very quickly.

Correspondence | [Published: 17 March 2020](#)

The proximal origin of SARS-CoV-2

[Kristian G. Andersen](#) , [Andrew Rambaut](#), [W. Ian Lipkin](#), [Edward C. Holmes](#) & [Robert F. Garry](#)

Nature Medicine **26**, 450–452 (2020) | [Cite this article](#)

5.72m Accesses | **2598** Citations | **35458** Altmetric | [Metrics](#)

From the paper: "Our analyses clearly show that SARS-CoV-2 is not a laboratory construct or a purposefully manipulated virus."

Press: "By comparing the available genome sequence data for known coronavirus strains, we can firmly determine that SARS-CoV-2 originated through natural processes," said Kristian Andersen, PhD, an associate professor of immunology and microbiology at Scripps Research and corresponding author on the paper.

<https://www.scripps.edu/news-and-events/press-room/2020/20200317-andersen-covid-19-coronavirus.html>

Andersen, the first author, is the person who wrote the email to Fauci saying that he couldn't see how the genome was consistent with evolutionary theory. Andersen was very soon after referring to the engineering idea as a "crackpot" theory – he used that word in emails. The idea was pushed to the margins in a matter of days. The scientists were pressed on this, and Andersen and others have said that it was more discussion and data that convinced them, especially a close relationship between the Covid virus and a virus in pangolins. As it turned out, the pangolin virus does not have, and was known not to have, the most controversial part of the Covid virus, the furin cleavage site that prompted the initial concern in that first email. The whole pangolin link seems to be more or less dropped from discussion now; they don't seem to be a bridge species. But, of course, the

⁶ <https://www.nytimes.com/2021/06/14/science/covid-lab-leak-fauci-kristian-andersen.html>

virologists might have thought at the time that this link was likely, and that's all perfectly fine.

Questions can be raised about a lot of this, and people do raise questions about the speed with which the conclusions were being shifted. But what I want to focus on is what happened later, especially what's happened *this* year (2022), a couple of years on.

As we all know, there was a politicization of the outbreak question – from the right especially by Trump, who was as irresponsible and destructive as he always is. That led to the lab-leak idea being associated habitually with the right, and it was labeled a conspiracy. The word "conspiracy," or "conspiracy theory" was used by Francis Collins in emails – he said we have to shut down this conspiracy.

The left-leaning media got on board quickly. Below is a comparison of headlines, but not from different stories.

The image displays a side-by-side comparison of two versions of a Washington Post article. On the left, the original article from February 17, 2020, is shown with the headline "Tom Cotton keeps repeating a coronavirus conspiracy theory that was already debunked". On the right, a revised version from June 2021 is shown with the headline "Tom Cotton keeps repeating a coronavirus fringe theory that scientists have disputed". A "CORRECTION" box on the right explains that the original headline and text were inaccurate and have been removed.

Washington Post in June, 2021
modifies headline and text of
an article that ran in Feb, 2020.

By Paulina Firozi
Feb. 17, 2020 at 11:04 a.m. EST

CORRECTION
Earlier versions of this story and its headline inaccurately characterized comments by Sen. Tom Cotton (R-Ark.) regarding the origins of the coronavirus. The term "debunked" and The Post's use of "conspiracy theory" have been removed because, then as now, there was no determination about the origins of the virus.

On the left is a *Washington Post* story that was posted with its headline after US Senator Tom Cotton began asking questions about the lab-leak idea: it is referred to as "a conspiracy theory that was already debunked." Over a year later, the *Washington Post*

changed that headline.⁷ On the right of the slide is not a new story; it's a new headline for the old story, taking out "conspiracy theory" and "debunked," and putting in "fringe theory that scientists have disputed." In the time since that early media-led attack, people have had to concede, more or less, that we don't really know enough about the origins of the virus to say what was being said with the word "debunk" there.

This was not a good thing to do. Headlines should never be changed in this way; they are part of the historical record. They're part of the responses that people had at the time. If that was the headline you had, it should be the headline that stays. But this was the dynamic; there was an early attempt to label it as a mere conspiracy theory. The fact that Tom Cotton was involved is, of course, important in this.

Since then, not just the media, but also government agencies have resisted investigation of the idea at various stages. Jeffrey Sachs, who is here at Columbia, chaired a *Lancet* Commission on Covid. That commission recently released a report that simply said that both options for the source of the initial outbreak were live possibilities. For those of you who follow these matters, the list of authors there includes some very mainstream people. It's not a bunch of renegades that Sachs has put together.⁸ (Some people who are against the lab-leak idea did leave the commission, though, and Sachs asked some others to leave because he thought they had conflicts of interest.)

**The Lancet Commission on lessons for the future from the COVID-19 pandemic**

Jeffrey D Sachs, Salim S Abdool Karim, Lara Aknin, Joseph Allen, Kirsten Brosbol, Francesca Colombo, Gabriela Cuevas Barron, María Fernanda Espinosa, Vitor Gaspar, Alejandro Gaviria, Andy Haines, Peter J Hotez, Phoebe Koundouri, Felipe Larrain Bascuñán, Jong-Koo Lee, Muhammad Ali Pate, Gabriela Ramos, K Srinath Reddy, Ismail Serageldin, John Thwaites, Vaira Vike-Freiberga, Chen Wang, Miriam Khamadi Were, Lan Xue, Chandrika Bahadur, Maria Elena Bottazzi, Chris Bullen, George Laryea-Adjei, Yanis Ben Amor, Ozge Karadag, Guillaume Lafortune, Emma Torres, Lauren Barredo, Juliana G E Bartels, Neena Joshi, Margaret Hellard, Uyen Kim Huynh, Shweta Khandelwal, Jeffrey V Lazarus, Susan Michie

Executive summary
As of May 31, 2022, there were 6·9 million reported deaths and 17·2 million estimated deaths from COVID-19, as reported by the Institute for Health Metrics and Evaluation (IHME) throughout the report, which is and peace that governments are committed to pursue as members of the UN. We address this Commission report to the UN member states, the UN agencies and multilateral institutions, and multilateral processes such as the G20 and the G7. Our aim is to ensure that

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[https://doi.org/10.1016/S0140-6736\(22\)01585-9](https://doi.org/10.1016/S0140-6736(22)01585-9)

⁷ This was discussed on twitter here:

https://twitter.com/greg_price11/status/1399813030066724865?s=20&t=ayyUVjn6Y3GphP7mQ3WHaA.

⁸ <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2822%2901585-9>

Here's their statement about how things look:

Key findings

- The proximal origin of SARS-CoV-2 remains unknown. There are two leading hypotheses: that the virus emerged as a zoonotic spillover from wildlife or a farm animal, possibly through a wet market, in a location that is still undetermined; or that the virus emerged from a research-related incident, during the field collection of viruses or through a laboratory-associated escape. Commissioners held diverse views about the relative probabilities of the two explanations, and both possibilities require further scientific investigation. Identification of the origin of the virus will help to prevent future pandemics and strengthen public trust in science and public authorities.

... And here's how things went for Sachs when he was trying to put this together. This is from an interview. Sachs said: the NIH was asked at one point, give us your research program on SARS-like viruses. "And you know what they did? They released the cover page and redacted 290 pages. They gave us a cover page and 290 blank pages. That's the NIH for heaven's sake. That's not some corporation."⁹

CURRENT AFFAIRS

SACHS:

The most interesting things that I got as chair of the *Lancet* commission came from Freedom of Information Act (FOIA) lawsuits and whistleblower leaks from inside the U.S. government. Isn't that terrible? NIH was actually asked at one point: give us your research program on SARS-like viruses. And you know what they did? They released the cover page and redacted 290 pages. They gave us a cover page and 290 blank pages! That's NIH, for heaven's sake. That's not some corporation. That is the U.S. government charged with keeping us healthy.

What I found is that we have a lot of data which we're not finding right now. And I don't want to have to rely on FOIA and leaks, though

⁹ Source is: <https://www.currentaffairs.org/2022/08/why-the-chair-of-the-lancets-covid-19-commission-thinks-the-us-government-is-preventing-a-real-investigation-into-the-pandemic>

I think that emphasis is important. This is the NIH refusing to give information to Jeffrey Sachs of Columbia University, who is just trying to get to the bottom of things. This, of course, has made Sachs very suspicious. Sachs has now become fairly outspoken, saying he thinks the government is keeping things from us.

A Republican Senate Minority Report also came out in October (2022), which said that they thought, on balance, that the outbreak was more likely to be lab-related than a natural event, although this was not intended to be "dispositive."¹⁰

While precedent of previous outbreaks of human infections from contact with animals favors the hypothesis that a natural zoonotic spillover is responsible for the origin of SARS-CoV-2, the emergence of SARS-CoV-2 that resulted in the COVID-19 pandemic was most likely the result of a research-related incident. This conclusion is not intended to be dispositive. The lack of transparency from government and public health officials in the PRC with respect to the origins of SARS-CoV-2 prevents reaching a more definitive conclusion. Should additional information be made publicly available, and subject to independent verification, it is possible that these conclusions would be subject to review and reconsideration.

In response to that report, Kristian Andersen (Andersen of the email to Fauci saying he wondered how the genome could be consistent with evolutionary theory), and others have raised the temperature very far. Below is a Twitter response by Andersen to the GOP "report" (his scare quotes), and to a *Vanity Fair* publication that summarized the report and some data on which it was based. This was mostly data from internal communications within China – they got experts to look more closely at who was saying what in China at the time.



¹⁰ https://www.help.senate.gov/imo/media/doc/report_an_analysis_of_the_origins_of_covid-19_102722.pdf. The report was released by the Senate Committee on Health, Education, Labor and Pensions Minority Oversight Staff.

"Flood the zone with bullshit" – that's how Andersen describes what's going on.

Most important of all, here are some passages from an opinion piece by two other leading figures on the scientific side. These are both authors on a more recent "market origin" paper in *Science*, which says the outbreak was centered on the live animal market and there's no evidence for a lab leak.¹¹ The *New York Times* covered the paper extensively (both the preprint and published versions). Michael Worobey is the first author on that *Science* paper, and Angela Rasmussen is also an author. This (below) is from an opinion piece they wrote for the *Toronto Globe and Mail*.¹²

Our work should put to rest the hypothesis that SARS-CoV-2 emerged from a laboratory. To date, the sole evidence supporting a lab origin is the fact that the virus emerged in Wuhan, where WIV is located. However, WIV is not the only laboratory in China – nor, for that matter, in the world – that houses bat coronaviruses. If community transmission began at WIV, we would have seen it at the centre of early cases. We did not. That means WIV is as incidental as any train station, department store or dentist's office.

From this work, the evidence is clear: Huanan market was the epicentre of this tragic pandemic, and it is virtually certain that the emergence of SARS-CoV-2 was linked to the trade in live wildlife. Anyone who tells you otherwise either doesn't understand the science, or doesn't want you to understand it.

OPINION

COVID-19 almost certainly did not come from a lab leak. Here's how we know

ANGELA RASMUSSEN AND MICHAEL WOROBNEY
CONTRIBUTED TO THE GLOBE AND MAIL
PUBLISHED JULY 28, 2022



The important part is the last thing they say. "From this work, the evidence is clear: Huanan Market was the epicenter of this tragic pandemic, and it is virtually certain that the emergence of SARS_CoV-2 was linked to the trade in live wildlife. Anyone who tells you otherwise either doesn't understand the science, or doesn't want you to understand it."

There's a lot we could say here, but I want to focus on this little bit in particular. It's not the Mafia, to use Kitcher's analogy. Absolutely. It's not the Sopranos (who are also mentioned in Chapter 1). Very far from it. It's nothing like that. But if you are a young scientist with ambition, and some doubts, how would you respond to this? Suppose you

¹¹ <https://www.science.org/doi/10.1126/science.abp8715>

¹² <https://www.theglobeandmail.com/opinion/article-covid-19-almost-certainly-did-not-come-from-a-lab-leak-heres-how-we/>

A bit more: "we can confidently say the pandemic began at the Huanan Wholesale Seafood Market in Wuhan, with all evidence pointing resoundingly at zoonotic spillover (transmission from live animals sold there)."

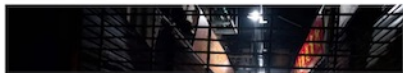
have some ideas of your own about the furin cleavage site, some things that people might have overlooked, or some other aspect of the genome that looks funny to you. You would like to press a bit. And what you read from two people who are absolutely central as insiders on the scientific end of things is: "anyone who tells you otherwise [an alternative to the mainstream view] either doesn't understand the science, or doesn't want you to understand it."

Below is a comparison of that passage with a key passage from Kitcher and Keller again:

OPINION

COVID-19 almost certainly did not come from a lab leak. Here's how we know

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tragic pandemic, and it is virtually certain that the emergence of SARS-CoV-2 was linked to the trade in live wildlife. Anyone who tells you otherwise either doesn't understand the science, or doesn't want you to understand it.

have been very eager to show them up. If the data behind the graphs were insufficient or if the statistics had been fudged or badly done, that would provide a great opportunity for some young researcher. Make your name by exposing the mistakes. Or showing how some viable alternative explanation of the correlation had been left out. Scientists are *really* fond of asking their peers whether they have considered some rival approach.

It's not the Mafia; it's an emergency in which people are doing science with a sense of broader priorities – relations with China, not wanting the biomedical establishment to be discredited. This has led to a degree of insistence and refusal to doubt that I think is very discouraging, especially here in this passage, an attempt to *pre-label* future dissent as incompetence or deception.

This deliberate stuff combines with larger developments. Other things have changed. Here we are looking not just at recent years, but a little bit further back. There's more centralization, it seems, in the networks that fund science. There's also a need to continually get new grants. A paper by Gross and Bergstrom talks about the vast amount of time that researchers spend writing grants. It can often be around 20% of a person's

research time, and anecdotally, in medical schools it can be fully half of their time.¹³ In that situation, who can you afford to anger and alienate? If you're a young scientist with ambition, bothered by genetic oddities around SARS-CoV-2 – or even if you're *not* bothered by that, even if you have doubts about something completely different, with no relationship to the pandemic, but that goes against the mainstream and has some public health visibility.... If you were a young scientist, how would you respond to this?

That's where I want to end the first part of the talk, the part about changes in the networks of trust and power relationships around science.¹⁴ Now I'll talk a bit about climate change.

¹³ <https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000065>

¹⁴ Here is one point that came up in the question period at the Columbia talk.

The person who has been criticized most in this general area is Tony Fauci, but in the material I am talking about, the government official who appears inclined to intervene in more problematic ways is Francis Collins, the (former) NIH director, not Fauci. This passage is from Nicholas Wade's article "A Covid Origin Conspiracy?" (<https://www.city-journal.org/covid-origin-conspiracy>)

Even after the March 2020 *Nature Medicine* article, which made the natural origin theory the mainstream view, Collins still fretted that the lab-leak idea had not been sufficiently suppressed. "Wondering if there is something NIH can do to help put down this very destructive conspiracy," he emailed Fauci on April 16.

Fauci was less concerned. "I would not do anything about this right now," he replied the next day. "It is a shiny object that will go away in times."

Fauci's "shiny object" attitude seems quite reasonable (assuming he stuck with it). Let people freely discuss the question, and see where things go. One of the ironies of this affair is that the broad attempts to discredit those discussing the lab-leak hypothesis and to keep information under wraps have made people much more suspicious – have consistently made the object shinier. See, for example, the Sachs discussion above.

2. Possible solutions in the area of climate, which Kitcher and Keller cover in the latter part of the book.

The Seasons Alter is, again, mostly about climate problems, and the treatment of trust and dissent that I focused on just now is ancillary to the discussion of climate change itself. In that area, there's just one idea I want to offer (and this part of the talk is much shorter).¹⁵

First, what do Kitcher and Keller say is the solution to the climate crisis? Here is a crucial passage. This is a discussion between a different Joe and a different Jo later in the book. The argument from Concerned-Jo is that we need a global alliance, "an alliance of all humanity," to combat a new enemy. The enemy is atmospheric carbon, which threatens our future.

(Pause.)

Behind the League of Nations was a splendid idea. Of course, the League itself failed. Spectacularly. Catastrophically. The UN has done better—but not as well as its architects hoped. Not well enough to offer much encouragement. (Pause.) If we had that model in mind, there wouldn't be a serious basis for hope.

But there's another way to think about global governance. The League and the UN emerged after devastating wars. Wars in which nations had worked together as allies and supported one another in a common cause. We believe we should see our situation today in just that way. We need an alliance . . . a global alliance . . . an alliance of all humanity . . . to combat a new enemy. Atmospheric carbon. It threatens our future.

Joe: Of course you're right. Nations do ally together. They make deals and support one another. But only while the threat endures.

Jo: And . . . you'll say . . . nobody will sign on to a *permanent* global structure. It's a good objection. (Pause.) But can I set it aside for

the present? I promise to come back to it. OK?

Joe: Sure. Go on.

Jo: What does this alliance need if it's going to defeat the enemy? First, it must have what previous international climate meetings . . . climate summits . . . have already provided. A forum for discussion, and for making commitments. But what we've had so far isn't enough. The threat to the future is so large . . . so urgent . . . we can't settle for periodic meetings. You need constant review. You need a body that meets all the time and is always equipped with the latest . . . the best . . . information. And, as I said, with enforcement powers.

Its scope is limited. After all, it's set up to win a war. Anything not relevant to winning that war is no part of its purview. But more falls within its scope than you might initially think. Policies for helping developing nations. Global population policy. Not just schedules for phasing out fossil fuels.

That's because you can't have a stable alliance unless the terms of cooperation are recognized as fair. Seen as just by all

I have always thought of this as unlikely to work, no matter how bad things get. My view is stronger now. I think, to be blunt, that it's not at all a reasonable thing to hope for. If this is what we need, and if the Kitcher and Keller view regarding the threat is right, then we are probably doomed.¹⁶

¹⁵ Another book I have found helpful and interesting in this area is Jonathan Symons's *Ecomodernism: Technology, Politics and The Climate Crisis*, 2019.

¹⁶ This is also a place where I disagree with the Symons book, *Ecomodernism*. He also puts a lot of hope in global democracy. For the record, I think Kitcher and Keller are perhaps overstating the risks. But that is not a topic for this talk.

The Ukraine war, and other recent developments since the publication of the book, have made some of this clearer. Germany, in particular, had put enormous investment into renewables before the war, many billions of euros, and now finds itself reopening coal-fired power plants – plants fired by brown coal, the worst coal – in response to difficulties caused by the Ukraine war. The appearance this gives to the rest of the world is that negotiation goes on with lots of public fanfare, but when things get difficult, the walk-back is immediate, even from a country with a very strong Green political presence, like Germany.

So are we doomed? No, I don't think we're doomed, and I want to have on the table an alternative approach. I think that a solution to the climate crisis has to be viable at a self-interested national level. Governments setting policy locally for their populations have to have a practical reason to choose clean power. And despite the gesturing and the rhetoric, they presently do not. What is needed is not a source of energy – solar and wind are essentially unlimited – but a storage medium. We need something with the convenience and reliability of coal and diesel. Basically, we need a kind of synthetic diesel, along with a fuel for jet planes. We need something that's like those fuels – something that's energy-dense at normal temperatures, unlike hydrogen, not too costly on the input side, as in the case of biofuels, ethanol and biodiesel, and something that doesn't require special handling at all stages.¹⁷ There's lots of research going on about this, but I think the solution might need to be thought about a bit differently. As this is the best real solution, it would make sense to have a truly massive government-supported project. I think of the situation *not* as one calling for a sort of new League of Nations, but one calling for a new Apollo or Manhattan Project.¹⁸

¹⁷ On biofuels, this is helpful: <https://climate.mit.edu/ask-mit/why-arent-biofuels-more-prevalent>

¹⁸ This technology could, in one sense, be quite an inefficient one. This is because the energy source used to create the fuel will probably be solar and wind, and those resources are essentially unlimited. There is no need to worry about getting a lot of the storage medium per unit of sun or wind, as long as we get a lot of the storage medium itself at reasonable cost. It's hard to make such a thing. But unlike manned spacecraft, nature has already made it. We can too. I write about all this in a bit more detail in a blog post from a few years ago: <https://metazoan.net/78-ecomodernism/?/>

What would that mean? According to a report from US Congress in 2009, those projects in their peak years – Apollo and Manhattan – absorbed about 0.4% of US GDP.¹⁹ That would be about \$92 billion per year now. That sounds like a size that would make things politically difficult, but I think it's not so difficult, at least not compared to every other option. My reasons for saying this take me to my last point.

This is not a project that the US needs to dominate or direct in any sense, but that doesn't mean that I envisage this as being guided by a huge international enterprise. Those earlier US projects show how a special kind of accounting can go with respect to projects of this kind. National prestige is irrelevant to the private sector, but is politically very powerful in democracies. Whether or not Apollo itself was worthwhile, it shows what is politically possible when national prestige at this scale is on the table. So the optimistic picture I have in mind is one where massive state investment by some country (or the EU) gives rise to the required technology, and it rapidly becomes rational for others to use it as well.

Finally: not everything has gotten worse since Philip and Evelyn's book was published, back in that faraway time before Covid, and positive developments can arrive more quickly than one might expect. There's another late passage in the book where the protagonists talk about what a decarbonized future might look like. Peering forward, they cautiously wonder whether it might be reasonable one day to rely on electric ambulances. They are already here.²⁰

¹⁹ <https://sgp.fas.org/crs/misc/RL34645.pdf>

²⁰ <https://newatlas.com/automotive/docgo-electric-ambulance/>