Jerry Ravetz in Discussion with Matt Finch, June-July 2020

Matt:
So, what does an exponent of post-normal science make of the current pandemic?

Jerry:
For a while, the uncertainties and complexities diagnosed by the post-normal science approach have been coming in from the margins, until right now they're almost in the mainstream of thought and discussion. Once that happens, it will open new possibilities - and new problems.

Some people say that COVID-19 is overblown, basically no worse than a new flu. Clearly people are dying in a nastier and more distinctive, identifiable way. We're getting a constant flood of tearjerking stories: lovely good people struck down, and we must do everything we can to stop it.

On the other hand, we've got people asking whether we are destroying our economies to no good purpose. If governments are seen to be heartless, that will cause them a lot of problems, but it's also the case that people are always dying, and we have to make decisions about which deaths we try to prevent, and how far we go in that intervention.

In previous pandemics, the solution has been to wait it out, accept that some will die, and understand that eventually life will go on. Now, however, we can try to preserve people from this thing. It's the trolley problem which philosophers like to debate: what should you do when you can save a life, but at a cost?

These paradoxes are insoluble, and they only occur when you have the agency to intervene. Governments have to decide right now, on the basis of whatever information and advice they have available, what to do. Lockdown gives us a pretence of quantification: we can say we spared X people a day from getting sick, or dying horribly. However, if you ease the lockdown, it helps the economy. the negative impacts and costs of lockdown are less easy to quantify and the story we tell about the costs of lockdown is less clear-cut.

I saw the Wall Street Journal piece comparing the relatively successful lockdowns in both Aotearoa New Zealand and Australia, pointing out that the Kiwis are expected to bear a heavier economic cost for their stricter approach.

The natural reaction is to avoid the most well-defined killer outcomes, but that's because of how well-defined and quantified the pandemic deaths are, it doesn't necessarily reflect the severity of the impact.

A lockdown like the one the British are experiencing wouldn't have happened if we hadn't made a mess at the beginning. The New Zealanders have done well, as have Greece - Greece! with all the economic turmoil they've been through. Somehow or other they managed to have a sharp reaction.

In 2019, the Global Health Security index had assessed 195 countries' ability to prevent and mitigate pandemics; the UK had been ranked second only to the US. These nations should have been able to provide an exemplary and effective response to COVID-19, but instead are floundering.

Both the US and UK had high level committees that warmed them of what was coming, and I believe those experts assumed that the administration would be ready to snap into action.

However, both countries have had years of right-wing governments, leading to what John Kenneth Galbraith described as "private opulence and public squalor". The focus has been on superfluous private goods instead of necessary public goods, that's the name of the game. Naked capitalism in the US, and in the UK a smeared-over, quasi-welfare-state. Those who are in

real desperate need simply don't have a voice: just look at the residents of British care homes for an example.

The pandemic has definitely exposed the lack of care and respect our societies show for the elderly.

There have been ongoing scandals for years running up to the current pandemic, conditions were known to be terrible, but a committee would be called together and some reports would be written, but ultimately the decision was that here was nothing to be done. There were no votes in it, and it would take a lot of money to fix.

In the US there's really no provision for the "throwaway people": prisoners, nursing home residents, those who are just plain homeless. I wouldn't be surprised if they have historically been focus points for disease; they are certainly suffering under the COVID-19 pandemic. Disease of bad sanitation have been flourishing in California; people living in cars, with no access to toilets and hygenic facilities.

I was in Sacramento last year and I was astonished by the level of rough sleeping. Walking through Sacramento just after dawn, you could see all the building managers and superintendents kicking the homeless people out of the doorways and nooks in which they'd been sleeping, knowing that they would return late that night. Brushing the problem out of sight for the daylight hours.

I know that such visible homelessness is also to do with climate - I lived in Brisbane, where it's easy to sleep out in such warm nights - and that homelessness in colder locales can be hidden, with people enduring precarious living conditions, temporary accommodation, couch-surfing.

Technically, the US has some of the very best healthcare and science, the best in the world, but the delivery gets worse and worse until you get down to this level, that of the "throwaways".

So it's a question of inequity and health disparity, too. <u>I saw the CDC's report on how health inequalities can exacerbate the effects of COVID-19 on disadvantaged minority communities</u>.

In the UK, the story is slightly different. You can compare it to the BSE crisis of the 1990s. There, too, we saw this very English civil servant reaction: avoid public alarm and don't spend money.

When BSE was first recognised as a problem, the government called together a committee of the great and the good. The report said that the probability of a serious outbreak was small, but the impact, if it does happen, will be grave.

By the time the report went to the minister, the first part of that phrase was included, but the clause about the impact was left out. The work was being done by MAFF - the Ministry of Agriculture, Fisheries, and Food - and the Ministry of Health. This meant any serious research had to get around a lot of civil servants.

The official line being taken was that BSE couldn't spread beyond cattle. Then it spread to other ungulates. Then a cat got it - they named him Mad Max! He got it from eating bad meat. This raised the question, if the cat can get it, maybe people can, too? "Oh no," they still insisted, there's no evidence." But pet food suppliers didn't take the chance and they promptly stopped

using British beef. That meant that for the next five years, you were safer eating cat food than going to the butcher in Britain. The public didn't know this at the time. Did John Gummer know this when he ate that burger for a publicity stunt?

I imagine that a government is thinking about protecting its beef exports in such a situation, and that could motivate people to downplay the dangers.

There was a microbiologist in Leeds, Richard Lacey, who was quite openly critical of what was going on. His department, however, was totally dependent on government support. A decision was made by the Ministry to cut its funding, but then the department was told, if Richard Lacey takes early retirement, we'll think again. So he left, and wrote about it in an autobiography.

Elsewhere, a farmer named Mark Purdey was unconvinced by the blame for BSE being put on recycled meat. He was an organic farmer in south-west England; he never used the cattle cakes which were being blamed. His herd were grass fed, yet still had BSE. He had an alternative theory, that the insecticide which was put along the spine of the cows to prevent Warble Fly was to blame. The fly made pits in the skin which reduced the value of cowhide, so this insecticide, a neurotoxin was used, and he suspected this was getting into the cows' spinal cord. His suppositions had some support from scientists at Cambridge, and from a sympathetic Tory MP, but he began to experience a great deal of harassment, and was ultimately driven to sell his farm and move.

The civil service was determined to avoid public alarm, until people started coming down with symptoms like Creuzfeld-Jacob Disease, and the Ministry of Health intervened. There were a dozen or so cases reported, with lesions on the brain, and it looked pretty clear that the disease had made it from cattle into the human population.

A senior civil servant told me that MAFF were like rabbits in the headlights, with no idea of how to act. Between ministers, civil servants, and scientists, there was a leak and then early one morning on the Today Programme, the minister was put on the spot and had to let it be known.

This political issue then influenced the science. The Chief Scientist at the time was a very outspoken Australian, Bob May. With the Major government collapsing, Bob May inserted some guidelines for scientific advice, formalising how science related to policy - a kind of Plimsoll Line.

I feel that in the UK right now, we're also feeling the impact of that old paradigm where the state knows best - what you call the "decide - announce - defend" approach in *The No-Nonsense Guide to Science*.

Well, they try it but they don't get away with it. We still have a pretty vigorous media in the UK and there is open debate. There is disagreement with scientists and policymakers. When the airlines are told there will be restrictions on their operations, they don't just take it, they say: "Let's see the science."

But science, in any case, is not going to tell you to put a quarantine in place today. That's not what science does; it gives evidence, models, ideas, but then leaders have to make a decision.

In the UK, mistakes have clearly been made. Matthew Syed did a good job of explaining about that in his recent piece for the *Sunday Times*. It was the classic English civil service "play it cool, keep the public muddling along, aim for herd immunity, prevent the peak." And there is strong

evidence that the Prime Minister had just too many other things on his plate to be bothered with this.

Along comes a scientist, himself not entirely unproblematic, who says that the worst case could be half a million dead and the NHS overwhelmed.

We're talking about Neil Ferguson, right? What made this scientist "not entirely unproblematic"?

Previously he'd given advice on epidemics, which always predicted huge damage unless severe measures were taken. On occasions when his advice was not followed, the epidemics turned out to be quite minor. Then in the debates over the management of the pandemic, his model was criticised. In response, he told an interviewer for the Sunday Times that he had 15,000 lines of code and no documentation at all, so no-one else could use the model and he was too busy to share it.

He said "For me the code is not a mess, but it's all in my head, completely undocumented. Nobody would be able to use it . . . and I don't have the bandwidth to support individual users."

Regardless of the possible defects in the model, this behaviour is so contrary to any principles of scientific practice, as to be quite breathtaking. Of course he has had his defenders. He had to leave his advisory position because of being caught breaking lockdown with a sex partner; but professionally he seems as secure in his position as Dominic Cummings is in his.

Once the possibility of the NHS being overwhelmed was raised, that changed matters, didn't it?

This government has many faults and failures, but they did recognise they can't afford to allow the health service to be overwhelmed. Under no circumstances can you allow your health service to collapse: once doctors and other staff get sick, teams break down, routines and processes fail, and it's not a question of repairing the service, it becomes a question of rebuilding it. And that means going a long time without a functioning health service.

So that's why we had a lockdown - to protect the NHS. Prior to that we'd had the Prime Minister going on holiday, failing to attend COBRA meetings. There was a complacency in the civil service which then turned into panic.

Again, this was pretty sound thinking on the government's part, to say: Stay Home, Protect the NHS, Save Lives. It was pretty explicit why this policy was in place.

Why was there complacency? It comes back to that GHS report which suggested the US and UK should have been well placed to deal with a pandemic.

Partly this was because of disbelief in the warnings they had been given. There are always warnings, and the question becomes which potential crises to prepare for. Like the Carrington Event of 1859; this was a solar storm which took out telegraphic communications on Earth. Today it would take out the whole bloody shooting match, and we have no idea of when we would get things up and running again! However, we would have some notice of an impending solar flare; hopefully we would be able to tell people to shut down, switch off their computers and so on, then send out the carrier pigeons to tell them when to restart everything.

And these disasters - pandemics, solar storms, are the nice disasters, to use the phrasing of Martin Rees, the Astronomer Royal, who does spend time worrying about such existential threats.

What makes these "nice" threats?

There's no corruption, no stupidity, they're just a force of nature. The challenge comes in how we choose to respond to them. This leads us back to the philosopher's trap, the trolley problem: do we destroy the economy to save lives?

The lockdown creates new challenges: if you send kids to school, they'll likely be okay, but they can then infect parents; if the kids stay home, this has an impact on people's ability to do their jobs and take care of responsibilities other than childcare. Whatever you do, there's a disruption.

What about the US?

The situation there, I'm still making sense of. The challenge is that politics has become so polarised that you effectively have two sorts of science: Democrat Science and Republican Science, and each demonises the other. It's like Sunni and Shiite, Protestant and Catholic. There's a totality of worldview, an assumption that I'm perfectly right, and a demonisation of the other.

We've long talked about what CP Snow called the "two cultures", but here we see two cultures within science. For a while this division was focussed on climate change, then all of a sudden the virus becomes the battleground. Trump's comments have accentuated the divide but it has been there a long time.

When do you feel this split happened? Because there clearly have been more technocratic Republican administrations where scientists, policymakers, and politicians had a less fraught dialogue?

Well, if you really go all the way back, you can take it to Andrew Jackson. The first six presidents were all New England aristocrats. Then Jackson comes in, and at that point America changed. However, there was still a monopoly on high culture in New England, and this culture was fed by big business and high finance. This culture was contrasted with what you found in regions away from the coast, in the Midwest, in the slave-owning South. There was the Civil War and beyond that, an era in which the rich were running the joint: the time of the robber barons.

At the turn of the century, you had a progressive movement, you had William Jennings Bryan and the Populist Party.

I don't know much about American politics, and certainly not this era. He was a significant force in the Democratic Party at the time...nicknamed "the great commoner"?

Bryan, representing the agrarian Midwest, wanted to move to silver instead of the gold standard. In the cities there was a great movement for cleaning up corruption, and general reform. Teddy Roosevelt rode that wave to the WhiteHouse. Then there was Woodrow Wilson - "the intellectual's President". But after the War it was the time of big business, under Coolidge and Hoover. And after them, the Depression, FDR, and his patrician revolution, and the Second World War.

And you feel the war changed the nature of American science?

Yes, because of the refugee influx. These brilliant minds, these talented researchers, came to the US, fled from the conflict in Europe, from the oppressive regimes there, and found new homes in the US.

Prior to this, American science had been very far from the global mainstream. They had a tradition of wonder workers, wizards almost; self-educated souls like Luther Burbank and George Washington Carver, making amazing scientific discoveries in fields like agriculture without having come via the more institutional route to scientific authority that you found elsewhere in the world. Figures like Edison, Tesla; each of these was something of a wizard. The agricultural men were really mystics; Tesla was interested in psychic research.

These were larger than life figures, cultural and institutional outsiders. But an infusion of overseas talent, and the bureaucratization brought about by FDR's policies and subsequently the war effort, transformed things. We had more internationally great universities, we had Big Science, the beginnings of the military-industrial complex and the technocracy of the Cold War.

The "wizards" had been folk heroes, outside universities. But now the whole apparatus of science was tied in with the university system and the federal government; a reappropriation of science by coastal elites and their institutions, cut away from folk traditions.

Of course, these folk traditions had been part of a colonial enterprise.

That meant that a lot of scientific discoveries had come about as a result of local ingenuity. Historically, the elite had been geographically and culturally distant from the general populace. The American folk heroes of science had been practical figures; there wasn't the mandarin culture you found, say, in Germany, and there hadn't been a formal ecosystem of scholarship. The refined elites had a very small audience, and the big names of science weren't part of that elite.

Once that tradition in American science had been neutralised and absorbed, the telling of what happened remained with the sophisticated elites of New York and New England. But the culture which they disdained had its own integrity. This side, the folk science, was repressed. The elite had captured the prestigious institutions, the mass media - and yet it persisted. It was alive and kicking, only ignored by the powers that be.

I saw it teaching in California, in Santa Cruz, at a time when hippie culture was prevalent. I went to a seminar by a well-known conservative intellectual; a student had said to me, "You might find this weirdo interesting."

At the event, I met a grad student who had converted to conservative Christianity. He said he felt like an invisible minority, he made the comparison of saying they felt like Palestinians. To them, it seemed that if you were a Christian who actually believed in Jesus' miracles, for example, there was no point in applying to the divinity schools of elite universities. An author like Phyllis Schlafly wrote book after book about the evils of the secular world, and they sold like hot cakes, but they'd get no attention from the New York *Times*, would never appear on their book list; there was always an excuse, such as that they didn't count theological texts. But what was really going on, I think, is that an increasingly secular elite didn't want to know about these people. I have seen that there is now a film about her!

The heirs to this are people like Paul Krugman reviewing a book on climate change by Michael Mann and saying that these people (Hillary's 'basket of deplorables') are 'depraved'. Two worlds are divided on the science with a religious intensity.

With climate change, you can point to weaknesses in the argument, but what you're always told is that catastrophe is always ten years from now. So it never really goes away.

With the pandemic, people are dying right now, so the crisis isn't deferred. Somebody comes along with pills that were intended to treat malaria, another they're used for lupus, they are cheap and in universal use, and it would be bad for business for the biomedical industry if they were employed as a treatment. They're already used on-label and the off-label risks are well known. Somebody says at a certain stage of the coronavirus infection, using these pills might make a difference. And this becomes folk medicine against elite scientific medicine; it doesn't have the institutional imprimatur but people want to try it. This conflict, too, becomes folk against the elite - folk medicine, suppressed for all these years, rears its ugly head again.

Trump then says, I take these pills; he talks about taking bleach and sunlight into the body. This is Trumpery; he is a populist president so of course he aligns himself with folk thinking and anti-institutional movements. I wouldn't vouch for the idea that these pills do any good, or any scientific validity to that point of view - but the point is that the pills are a political battlefront between different kinds of knowledge, and communities that respect different authorities.

I'm a little cautious here, and I'd say this is the hardest part of our conversation for me to process. Firstly, in humility, that's because I just don't know the US history well enough to speak confidently on this topic, especially not in these broad-brush terms. It's also because of that question of folk science arising from the colonial enterprise; the links to slavery, colonisation, treatment of Indigenous peoples. Andrew Jackson might be a president who didn't come from that coastal elite background, representing a different side of America, but he was also a slave owner and trader, and caused harm to Native American communities and people of colour. He was a champion of white men, not "the people".

It would also be dangerously easy to depict your narrative as saying there was a good, pure, healthy American "people's science" which was in opposition to out-of-touch elites, and then foreigners came in - many of them Jewish, Central European victims of totalitarian and racist regimes - and corrupted or suppressed this folk tradition, in collaboration with big business and coastal elites.

Whereas presumably, Native American, African American ways of knowing and mastering the natural world were also excluded or damaged - both by the institutions and by the "folk science" you describe. Certainly in Australia, sophisticated Indigenous ways of knowing practised by Aboriginal and Torres Strait Islander peoples were neglected, overlooked, and disdained if not worse by European settlers.

Can you tell me more about that side of this history?

You can read Howard Zinn, *A People's History of the United States* – a book that has transformed the self-image of a nation for subsequent generations.

Also, isn't it just the case that the complexity of contemporary science makes it very difficult to be a "wizard". It's one thing to find new ways to improve crop yields in the 19th century, or experiment with physics as Edison and Tesla did, but science is now so

advanced and sophisticated that don't you really have to have more institutional apparatus around you to research at the leading edge and make credible discoveries? You seem to suggest as much in both "Science for the Post-Normal Age" and *The No-Nonsense Guide to Science*, when you talk about the ways in which women, the poor, and historically disadvantaged communities are excluded from science because they simply can't get the head-start and sustained focus on their education which is needed.

Finally, I can understand that business will look for ways to profit from health crises and health problems, but is it really the case that if something worked, an industry wouldn't quickly seek a way to profit from it? And isn't the bureaucracy of drug testing largely in place to ensure safety? Do you believe there's a conspiracy to stop people finding out that lupus meds are effective for treating the coronavirus, because there's no profit in it?

But suppose what worked was a common, cheap generic pill, so that there would be no profit in it and it would take away profit from other remedies. You know of *Bad Pharma* by Ben Goldacre.

You talked about the climate crisis always being ten years hence.

Reality testing for climate change is always being deferred. There are confirmations, but not refutations - we're quick to point to it being the hottest month on record, or polar bears dying, but when something happens which doesn't fit the narrative, it's the weather, not climate.

You're talking about a battle of anecdotes.

Anecdotes, rather than statistics, are the province of folk science.

But I know that doesn't mean you trust statistics! There's that section in your 2018 essay "Heuristics for sustainability science", where you critique Descartes' preference for geometry over more humanistic ways of knowing: "Many practitioners who nowadays receive emotional security from the belief that their spreadsheet will tell them precisely what to do with a project or company are living with the consequences of Descartes' desperate grab for certainty."

What is all this distrust and conflict going to do to science?

For me that is the great big question. Think of 5G, anti-vax, and genetic modification, to say nothing of nukes. Here, Big Science is lined up with very controversial technologies.

Let me take this back to the UK, because there's a British twist here. The UK government actually bought a whole bunch of these pills on the off chance that they were approved. A big trial was organised by thousands of participants, testing some five or six medications. The test will report by the end of the year - once again the outcome is being kicked into the long grass.

Why is that?

The answer depends on what is plausible for you.

There is a mass of debate going on, with lots of contested evidence. There's a small French test, far from definitive; another paper from a VA hospital, in turn critiqued. From my perspective, we've got pots and kettles calling one another black. A scientist might find that pills work under certain conditions - even the proponents don't say it's in all circumstances - but on the other hand, Big

Pharma also doesn't have a great record for integrity in tests. There will always be ground for a lack of trust. And this deepening lack of trust can become increasingly damaging and divisive.

So, if I get you right, you're saying that - irrespective of whether the pills work - Trump, by refusing to appeal to conventional institutional scientific wisdom, is strengthening his populism by tapping into a strain of folk wisdom that has long been entwined with American cultural and scientific life?

I guess the challenge for me there, in grasping this, is of course we still have folk wisdom, like family remedies for the common cold, but there's a danger in people going around ingesting bleach. And a kind of childlike nonsensical quality to hearing that sunlight seems to shorten the life of the coronavirus outdoors, so can we get sunlight into the body.

I'm also considering the way the White House physician carefully phrased that letter without stating directly that Trump was actually taking the medication he claimed to be taking. Why would he be doing that? Not to champion an alternative form of medical knowledge, except insofar as he profits from it in some way?

Trump is thinking about his audience. What he was saying about bleach might not look great, but compare it to the scientific research on opioids in the 1970s, saying that they weren't addictive. It seems ludicrous now, but institutions weren't admitting the truth until journalists blew the lid on it.

One particular drug company with a very high profile philanthropic family got caught, and the rest of the industry has stood by. So you can't have blind faith in the mainstream institutions, or contrast them with fringe knowledge in the way you suggest. We can't go into an analysis of scientific institutions assuming competence and integrity, you have to assume that the institution may be corrupted.

Does that cut both ways, though? Are you arguing for a deep scepticism of Trump's claims but also of the medical mainstream?

For the person who takes the pill, they might get better, they might get worse, but in the overall politics of the situation it doesn't matter. It's about two forces struggling for authority. Science ain't like it used to be - doing experiments to confirm a clear hypothesis. Reality testing isn't as decisive as we used to think it was, either. The differences between scientific and religious knowledge have become less sharp.

We might find ourselves in the situation of saying that even when the evidence for a particular thing, by some criteria, is very strong, you needn't look at it - "I don't want to know".

Here, I can grasp some of what you're saying. When I spoke about post-normal science centres to the Asia Pacific Science Centres conference last year, I had to make the confession that I took the science of climate change on faith, based on my trust in journalists and certain media outlets and certain institutions.

However, there's always going to be that question of trust, inevitably. Years ago, I met a Holocaust denier in Sydney, a French guy. It totally shocked me. My doctorate was about exile, emigre, and refugee scholars who fled Germany and Austria to the US and UK, so it was especially weird for me to run into someone who said, "How do you know the Holocaust happened? Have you been to the camps? Have you seen the showers, do you know for sure that they dispensed gas?"

At one point in a very long and tiresome argument, I said to the guy, look, I've never been to Ghana, but I feel pretty confident that Ghana exists...

It does seem that simple Holocaust denial is less prominent now than previously; but it may be that it flourishes on its part of the Internet where I don't see it.

The thing is that people on the fringe of science do discover things that lie outside the current paradigm. They know the criteria of accessibility are impossibly high, that scientists will say to the stuff that comes from the far side: "Even if I saw it, I wouldn't believe it."

But Kuhn's talk of the paradigm shift captures this - I think he even talks about conversion experiences as we move from one paradigm experience to the next, an explicitly religious metaphor.

I mean, at this point, I feel we need to be bringing the anthropologists in. Maybe the trick is to look at human practices of knowing and affecting the world as if we were an alien anthropologist, with no investment in any particular institution or community? How would such an outsider describe and analyse our processes?

We already have one, in Prof. Mike Hulme at Cambridge, seeing Climate as Culture.

Can we learn from the debates on religion? There we have belief at best, superstition and dogma at worst. My god is right, yours is wrong, it's undecidable. Distinguishing between the correct and incorrect, between good and bad science, becomes compromised. Pragmatically, I still believe there is a basis for judgment of quality, but maybe the undecidable area is now very significant.

I can personally believe a city or community is safer under lockdown, but maybe I'm wrong.

Strangely, the other thing this conversation is reminding me of is the fiction of Ursula LeGuin; fantasy and science fiction stories that are deeply humane and rooted in an anthropological world view. Hari Kunzru interviewed her for the *Guardian* back in 2014, and wrote about her as:

"one of the great writers of the American west, a product of a coastal tradition that looks forward at the Pacific with a wilderness at its back and the great cities of Europe very far to the rear. [...] Le Guin claims to "get very uppity" about the "parochialism and snobbishness" of the East Coast literary establishment. "The idea that everybody lives in a large city in the east, it's such a strange thing for an American to think.""

I'm going to give myself a bit of comfort here, because I'm nervous venturing out into the realm of bleach-takers, and UFO researchers, and the lineage from Andrew Jackson to Charlottesville in 2017. From your comment, "maybe I'm wrong", I'm going to point you back to the Quaker principle which you cite in *The No-Nonsense Guide to Science*: never forget that you might be mistaken. Maybe I can take that with me when I'm asking questions about responses to the pandemic, or climate change, or other big challenges of our time.

Up until now, every epidemic in history has gone through the acute phase, into herd immunity, and then vanishing.

Or coexisting less catastrophically with humanity. And isn't the point - going back to your comments on agency and the trolley problem - that now we do have the chance to intervene, and therefore we should seek to minimise harm and save lives where we can, even if we have to have a debate about how far we go?

All of these arguments are conditioned by uncertainty. We can, in very general terms, anticipate the consequences of lockdown - but not all of them. If we release lockdown, we can much more precisely anticipate how many will die. And so we focus on what is precise, because it's more convenient for us cognitively.

I don't know how this way of thinking moves us forward. Is it simply to acknowledge that uncertainty is present, and we must live with it, and acknowledge it in our thinking in a way we previously haven't?

Finding ways to openly address and acknowledge uncertainty may come to be recognised as the big problem.

What is really new now after COVID-19? Well, we've been firmly reminded that there are predators for whom we are prey. We cannot simply run the world, we are vulnerable.

Even Extinction Rebellion is still in the Cartesian dream, that we are in charge, and we can destroy nature. Maybe so, but more likely that nature may happen to destroy us.

I'm reminded of the novelist Douglas Coupland's line. A character asks, "If you could become an animal, what would you be?" and the punchline is, "You already are an animal."

This is an opportunity to rethink ourselves and nature, our identity and relationships. But it's also about what our societies can choose to do about health and welfare.

Sometimes politicians make decisions about going to war not on a rational basis, not because they want to, but because they want to preserve a way of life. These are the moral dilemmas that come with power. Think of William James' "Moral Equivalent of War":

"I spoke of the "moral equivalent" of war. So far, war has been the only force that can discipline a whole community, and until an equivalent discipline is organised, I believe that war must have its way. But I have no serious doubt that the ordinary prides and shames of social man, once developed to a certain intensity, are capable of organising such a moral equivalent as I have sketched, or some other just as effective for preserving manliness of type. It is but a question of time, of skilful propagandism, and of opinion-making men seizing historic opportunities.

The martial type of character can be bred without war. Strenuous honour and disinterestedness abound everywhere. Priests and medical men are in a fashion educated to it, and we should all feel some degree if its imperative if we were conscious of our work as an obligatory service to the state. We should be *owned*, as soldiers are by the army, and our pride would rise accordingly. We could be poor, then, without humiliation, as army officers now are. The only thing needed henceforward is to inflame the civic temper as part history has inflamed the military temper."

I believe that reality is always refracting; things will always go wrong, and our visions and plans will never fit perfectly. If the people making decisions can encourage belief in their perfection, they will go on and on until we are destroyed.

You make the point elsewhere that, despite the common belief that science does best under democracy, certain branches of the sciences have done well under authoritarian regimes.

But you also argue that democracy is the best setting for science, because it encourages the open debate and criticism which challenges vested interests, powers, privilege, and prejudice.

We need criticism and a free press. But that freedom also means we need to hear the voices and criticism that come from flyover country, from the throwaways, those who were labelled "deplorables".

I'm thinking of Sarah Kendzior's book *The View from Flyover Country*. She's an anthropologist turned pundit and vociferous Trump critic, but one of her points is that coastal elites have failed the residents of "flyover country" and that, for many, if you're born in certain parts of America, to certain parents, and a certain community, and you want a job that has a social mission rather than just making money, you're probably looking at a stint in the armed services.

It sounds like she was making useful warnings; whether they registered in time, however, is another matter.

Fiona Hill, the former White House Russia expert, was also interesting in this regard. She just got interviewed in the Guardian and talked about the problems of the US, of Russia, and of northern England, where she grew up, as being the problems of 'flyover country':

"Education becomes the purview of the elite. You start to see all educational opportunities confined in a certain income bracket or region [...] Just as in the UK, in the north and other places where the economy collapsed and the tax base eroded, it's the same in the United States. Local education authorities can barely make ends meet, and the same goes for Russia. So big swaths of the population in all three countries don't have the skills that are transferable."

I'm also concerned about the "woke", about no-platforming, and the unwillingness of people on the left to listen to certain voices. Sometimes it seems as if the only person not worthy of our sympathy is the white worker, who gets labelled as the oppressor despite their own dismal situation.

Again, I can't help but sound a caveat here. Look at the new Democratic candidate for President, another old white man. Do you think Biden represents a branch of American politics which won't court the white worker?

More seriously, thinking about no-platforming and "the woke", I can understand people not wanting to encourage or host hate speech. Speech connects to political and concrete actions; I can imagine that if I were transgender, already quite a marginalised identity, I'd be very fearful and concerned about people who denied the existence of trans people and their rights in a public forum.

For me, I'm frightened by the idea that if we aren't careful about how we have this conversation, we end up with Trump saying "there were very fine people on both sides" after Charlottesville. And I don't believe that's where you want to go, Jerry.

We reject uncomfortable knowledge, things that don't fit with our frame.

But how do we help people find common ground for conversations? How can they take on board stuff that is threatening? And how do we protect the vulnerable from hate?

Adam Kahane.

I'm so glad you said that! I love Kahane. *Collaborating with the Enemy*, what a book.

When I'm dealing with people who are at odds with one another, I draw on Kahane's examples from Colombia, Thailand, South Africa. If you can get people who are in armed conflict with one another to talk, to agree that the unwritten future is their common ground - that they both want a different future, even if they differ on where they want to head - that is the beginning of a discussion which brings together all parties.

And don't forget Ireland!

There are dilemmas and faultlines between elite and folk cultures. The line is cut most sharply in the States.

And my caveat again is about there being multiple folk cultures - not just the white working class, the South or the Midwest, but native and migrant communities whose ways of knowing might also have been disdained, rejected, attacked by the authorities.

But is there any way round this? Can the faultlines be bridged?

It's an ethical or spiritual ground, I believe. "Even though this person has views which are totally abhorrent to me, he or she is still human."

I'm thinking of Terence, and "I am human, and nothing human is alien to me."

But again, this speaks to issues like racism and trans rights. If someone sees an ethnic group as less human, or less than human; if trans people are seen as less human, or less than human, how do you find the common ground?

I can well imagine people from marginalized backgrounds being asked to show empathy and compassion for the supposedly pilloried white worker, but the question is how to get people who are racist, or sexist, or homophobic, or transphobic, to reach out to this common ground, common humanity, too.

It can be done. There's been some work on this in Patagonia; a sociologist and conflict researcher who spent years dealing with groups in armed conflict with one another.

I don't know enough about this - where in Patagonia, which groups? Is this within Chile, Argentina, or across the border?

It was just local problem somewhere, where there was close to civil war between the sides. They called in a couple of academics from Buenos Aires.

The researcher spent years secretly meeting with people on either side. Trust is slowly established, and then messages can be carried back and forth in the first year. After five years, the communities were able to speak to one another. The Northern Ireland peace process is another example. There, as in South Africa, the clergy could meet and carry messages, laying the ground for future direct meetings.

This brings me back to the voyage of discovery in my first book, *Scientific Knowledge and its Social Problems*. The idea of gaining objective value-free knowledge about the value commitments and integrity of the researcher.

Your comments elsewhere about good faith participation in discussions, and the fact that good faith can be legally policed, must apply here too.

Yes. These conflicts are political ones, there aren't logical solutions. It's about what we choose to value. You and I disagree profoundly, but we're both American.

I'm reminded of the Dutch anthropologist Abram de Swann, who was a survivor of the Nazi regime in Holland and studied ethnic conflicts in Yugoslavia and Rwanda. He talked about the ways in which identities are grounded in shared emotional concerns. He suggested that perhaps for us to agree on our common humanity, we would have to experience a shared threat - an extraterrestrial invasion, or a global environmental crisis.

I think of the Dreyfus case. French society was split down the middle, between Catholics and secularists. The Germans attacked and, in coming together to respond, they said, "We found the essence of France, we were all Frenchmen from that point on."

The Dreyfus case was also about antisemitism, so again, given the experiences, especially of the 20th century, I have to ask: how do we talk to the person who sees us as less than human?

You have to say of yourself, I don't care what he is. We're both human.

But is the problem whether you care what he is, or whether he cares what you are? How do you shift the perspective of the person who is persecuting you?

I encountered antisemitism as a kid in New Jersey. Where we lived in Camden, across the river from Philadelphia, it was a formerly good suburb, and there were some prosperous Jewish families, and other families who weren't so well to do.

We were totally secular and there weren't many obvious cultural differences, and I was pretty good friends with some Gentile kids, and one day I realised why they didn't like us: it was that we had leather shoes and they had sneakers. We had central heating. They saw us as doing better than they were, and they had negative feelings to these well-fed kids. When I recognised it as a matter of envy, I felt liberated.

I suppose the follow-up question there is: did it change their negative feelings, though? If I'm being treated badly because people perceive me as different or lesser, how much of the solution is about shifting my perception, and how much is about shifting theirs?

Does what you're saying speak to the future of science - a kind of peacemaking and reconciliation process across different communities with very different values of knowing?

Kahane did an excellent job with secular and ultra-orthodox Jews in Israel. He brought them together, but there was a blunder in planning: the Orthodox Jews said they couldn't begin the negotiation, because their Sabbath started at sunset on Friday. Kahane said, let's let the project run anyway, and even though no formal activities could be carried out, people hung out together. They showed one another pictures of their kids. There was a way forward to common ground. This was true of Kahane's work in South Africa too --

The future as an unwritten common ground --

-- and if you can tap into it, that's the way forward. Even a gangster worries about his kids.

After all, that's the main dynamic in *The Sopranos*, where the immigrant culture was not reproducing itself, and the family had to pretend to be suburbanites.

Something which occurred to me when re-reading this transcript was that the "fringe" knowledge which proves to be vital might also come from the transgender community. I was thinking about the writer Meg-John Barker's work, including the book [Life Isn't Binary](), which looks at applying the non-binary approach more people are taking to gender and sexuality and looking at other social issues through that lens. (There's a piece here on [using her writing to consider the COVID-19 pandemic]() which I found interesting).

I can see that there's a question here of allowing previously depreciated ways of knowledge to be heard and discussed.

As we were reviewing this transcript and tidying it up, you mentioned the "democratic turn" in science. So, just to conclude, I'd like to ask you two more questions.

The first is just whether you could elaborate a bit on this "democratic turn", and the other is about the question of compassion.

This might one of the really critical issues, which might be why it is never mentioned. I dealt with indirectly in an essay on science & nonviolence. It was delivered in response to an invitation from a Pugwash group and published in their journal. I tried to get various scientists interested in it, including one prominent Quaker, but had no success at all.

I've seen the piece, and I can see that it points us towards a notion of "non-violent science", characterised by the strains of non-violent thought in world religions; you mention "awareness: of one's own ignorance and propensity to error; of the readiness to learn from anyone, be they a student or a citizen; of responsibility for the unanticipated consequences of one's discovery or invention; of the possibility of doing evil in the name of good; and of the contradictions that afflict anyone who faces the corrupting pressures of power or responsibility."

When we first met, you suggested to me that one way forward for science or its successors was to think about science as a compassionate endeavour. I was interested in this, having just read Will Davies' book *Nervous States: How Feeling Took Over The World*. There, he argues that "Throughout its history, modern science has been vulnerable to the charge that it is aloof, amoral, and oblivious to ordinary people. Science, from this perspective, turns nature into something mechanical, abstract, and distant. But the entangling of politics and science, and the unruliness of climate in particular, today put an end to that."

The description fits quite well to the "Hillary-elite" who of course comprise most of the scientists. These are the sort of intellectuals who consider coal miners in Appalachia to be Bad People because they are contributing to Global Climate Change. Or, as Bruce Springsteen said, make a Presidential campaign issue of plastic straws when people in the rust belt are worried about their jobs.

Just as today we trust doctors and especially nurses more than many other kinds of professionals, Davies imagines a world in which the successors to scientists and science-minded policymakers are trusted rescue workers providing "emergency services": "[R]escue operations will occupy a more prominent role in society. Scientists are dealing with mortal systems whose decline and disappearance is an emotional issue, which should be recognised as such."

A beautiful sentiment. But only a very small minority of scientists see themselves as so employed.

Can you tell me more about how you see the potential uses and abuses of compassion?

I took a long time thinking about this. If you consider what crimes against humanity and God have been committed in the name of the man who gave the Sermon on the Mount, you become cautious about saying anything uplifting. Maybe it is one of those things where the Taoist principle applies: "Those who know do not speak; those who speak do not know". My own way out of the dilemma (I would not say solution), is to describe things as I see them; if others find something in the message that resonates with them, that's good; if they don't, that's OK too.

But I am not against such exhortations being made! [Sheila Jasanoff has a beautiful paper in which she calls for 'technologies of humility'](), and it is all the more effective because she is such a great scholar.

I think that my style is to analyse things as they are, and to observe where they are heading. Thus if scientists (particularly in the U.S.A.) are identified as belonging to the arrogant, hypocritical elite, then there will be a reaction from a significant public, which will not be changed by the outcome of an election.