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LOOKING UP AT THE DAM

One day in the autumn of 2013, I was eating lunch with some of the top climate change advisers to the government of China. They were visiting London to meet UK government officials and academic experts and talk about climate change and energy policy. At the time, I was a junior official at the Foreign Office.

Over a bowl of Thai chicken curry, I asked one of the Chinese visitors, ‘How well do you think your political leaders understand the scale of the risks of climate change? How big a risk do they think it is?’ He answered, ‘Not well at all. They think it’s a small, incremental change, that we’ll be able to adapt to it, and we will be OK.’ I asked if he thought there was a need for the risks to be better assessed, and better communicated to people at the top of government. ‘Definitely,’ he said. ‘It’s only if they think it’s a catastrophic risk that they will act on it.’

I had had to argue hard with my colleagues at the UK Department of Energy and Climate Change to be allowed to organise a single meeting in the programme of the Chinese visitors on the subject of the risks of climate change. There was no need, I’d been told; ‘the Chinese government accepts the science of climate change’. I found this an oddly binary way of thinking about risk. National security advisers who are responsible for protecting their countries against terrorism and war do not just accept that these risks exist. They do their best to understand how large each risk is, so that they can decide how much effort to put into containing it. The same is true for a doctor treating a patient with a serious disease, or an engineer considering a structure that might be unstable. Why should climate change be any different?

The more I thought about it, the more idiotic it seemed that we could be satisfied with the knowledge that political leaders accepted the reality of climate change, without wondering how thoroughly they understood the risks posed by it. The conversation with the Chinese experts was enough to convince me that not all was as it should be. If the leaders of the world’s largest emitter of greenhouse gases thought that everything was going to be fine, then there was a high chance that we were all going to be screwed.

Something clearly needed to be done so that world leaders properly understood how bad things could get if they didn't act in time. I started working up ideas for a project that would expose the shortcomings in climate change risk assessments and show how they could be done better. As I began sharing these ideas, I met a surprising amount of resistance.

The argument that there was no need to work on improving risk assessment because governments already 'accepted the science' came up often, despite being, when you think about it for a second, ridiculous. Perhaps it was a legacy of the well-funded climate denial movement, which had cowed environmental campaigners into an over-cautious way of talking about climate change. In 2009, researchers in the United States and United Kingdom had been accused of manipulating data to exaggerate the risks of climate change. Their email accounts had been hacked, their conversations misrepresented, and their reputations attacked in the media. Investigations eventually showed that the accusations were entirely unfair, there was nothing fundamentally wrong with the scientists' findings, and they had in no way falsely manipulated data. But by that time, a great deal of doubt about climate science had been sown in the minds of the public, and the climate science community had been traumatised and intimidated. The campaign of climate change misinformation has been estimated to receive funding of around a billion dollars a year in the US alone.¹ It is a powerful and frightening force. In the face of such an enemy, perhaps it is not surprising that many people working on climate change became content simply for its reality to be recognised, even while its risks were under-recognised.

The second argument against fully assessing the risks of climate change was that such 'doom-mongering', or even, as one of my colleagues once angrily called it, 'shroud-waving', would be counter-productive. This argument was potent because it seemed to be backed by academic research. Prominent experts in the communication of climate science had written that if people were told how bad climate change could be, it caused them to 'switch off' and give up all hope of doing anything about it. The contrast between the enormity of the problem and the futility of what they might individually do about it – such as switching off lightbulbs – was so great that people's instinctive psychological response was to disengage entirely. The argument went that such communications therefore did more harm than good.

The limitations of this argument, I realised, were that it applied to individuals, but not to governments. Individuals are free to react to unwelcome news of things they can do little about by 'switching off'; that is their right. Governments have no such right. The whole point of having a government is to take difficult decisions on behalf of society. Institutions

and processes are created to ensure that these decisions are well informed, taken whenever possible on the basis of hard evidence, dispassionately assessed. Authoritarian populists may decide policy based on their emotional reactions to information. Well-functioning democracies, and professional civil services, do their best not to. Again, a comparison with risk assessment in other fields is helpful. What would become of a national security adviser who stormed out of a briefing on a terrorist threat complaining that it was all too depressing? Or a chief medical officer who decided not to warn political leaders of an approaching pandemic in case the bad news caused them to 'switch off'? Obviously, such negligence is unthinkable.

The irony was that some of those misconceived public communications campaigns – telling people to switch off the lights to solve climate change, and the like – had been carried out by governments themselves. If a government wasn't going to use its enormous regulatory power to push fossil fuels out of the economy, why should anyone take seriously its instructions to fiddle with light switches? Voting for a different government would be a more useful thing to do. It would be rather tragic if civil servants learned the wrong lesson from these mistakes in public communications and then made the even larger mistake of not properly communicating the risks of climate change to their own political leaders.

The final and most difficult argument I needed to overcome was that 'surely someone has already done this – there must be lots of good climate change risk assessments out there'. Proving a negative is always difficult. To confirm that nobody had actually produced a thorough climate change risk assessment, I had to talk to all the people who supposedly had done.

Scientists, naturally, were assumed to have fully assessed the risks of climate change. How could they not have done? It turns out there are several reasons why they have not, which are explored in the coming chapters, but the simplest reason is that not all of the relevant knowledge is what you would call 'science'. How bad climate change could get depends on how many tons of greenhouse gases the world pumps into the sky over the coming decades. That depends on which policies governments put in place, which in turn depends on the battles between activists and vested interests, developments in technology, and international diplomacy. None of those things can be predicted by scientists. Neither can all of the ultimate effects of climate change. For example, will the stresses and strains inspire international unity in the struggle for successful adaptation, or lead to war for control of scarce resources and habitable lands? These are not questions of science; at least, not of the natural sciences. A full risk assessment needs input from a broader range of experts.

Economists, others assumed, had the answer. Nicholas Stern, a former top civil servant at the UK's Treasury, had reviewed the economics of climate change in 2006. His finding that the costs of inaction far outweighed the costs of action quickly became world-famous, and the headline numbers that came out of this giant cost–benefit analysis are still often quoted today. In 2013, however, Stern reflected on his own work and other similar studies. Economic assessments, he wrote, were ‘grossly and systematically underestimating the risk’, and he concluded that it was ‘irresponsible to act as if the economic models currently dominating policy analysis represent a sensible central case’.² If this was the view of the world's most famous climate change economist, then it seemed fair to say that economists didn't have the answer either.

Next up in the popular imagination of experts who have got climate change risk all figured out were insurers. I went to meet some, and found several thoughtful people in the City of London, one of the insurance capitals of the world, who were individually interested in climate change and concerned about it. But they explained to me that insurers had no professional interest in assessing the long-term risks of climate change, because insurance policies were only written for one year at a time. Insurers need to know how risks next year will compare to risks this year, but they need not look much further ahead than that.

I saw this for myself when I visited the headquarters of Tokio Marine, the largest property insurer in Japan. Their analysts showed me highly sophisticated computer simulations of typhoons arriving in Tokyo Bay and hitting the city. They had done some work to look at how climate change could affect the intensity of those typhoons. I asked if they had also looked at how the damage done would increase as a result of rising sea levels – an important consideration, since most of the destruction wreaked by typhoons comes from the flooding they cause, not from the wind itself. No, the analysts answered, they had not. This was too long-term and gradual a change to need considering. I crossed another profession off my list: insurers had not got the job done either.^a

The last resort was the defence community. The Pentagon, I was told, with its enormous budgets and capabilities for analysing every kind of threat, had certainly assessed the risks of climate change. I went to the Pentagon to find out if that was true. The US Department of Defense staff were friendly and welcoming, and told me about the assessments they had

^a Actuaries, I discovered, were interested in longer-term risks, but they too admitted they had no full assessment of the risks of climate change. The Institute and Faculty of Actuaries, the professional body of actuaries in the UK, later became a partner and sponsor of my risk assessment project.

done of the risks posed by climate change to US military assets. They were worried about how rising seas could flood naval bases and other coastal military facilities. They had also thought about how climate change could contribute to instability in other countries, but only within the timeframe of the next twenty-five years. Anything further in the future was out of scope.

For military planning purposes, a twenty-five-year time horizon is enough to make a reasonable assessment of most kinds of risk. Beyond that, nobody knows what weapons technology will look like, how the relations between countries might have changed, or what new threats might have emerged. Climate change is different. All of its risks increase over time. If we only look at the near-term future, we will be ignoring all of the largest risks, and this breaks the first rule of risk assessment: find out what is the worst that could happen. Whether we choose to care about those long-term risks is a different matter; to be able to make that choice, we have to know about them. So, I travelled back from Washington with the defence community crossed off my list.

This tour of the experts had left me feeling somewhat shocked, but also strangely energised. I had cut short a diplomatic posting to India where I had been working on counter-terrorism, after reading about climate change and deciding that it was a much larger threat. I had seen enough of the science to feel a deep fear about what we were letting ourselves in for. When you look at the 800-thousand-year record of the Earth's temperature that has been taken from the ice of Antarctica, you see how unstable the climate can be, and how unusually lucky we have been in these past ten millennia. All that we have become used to, the balance that we depend on, is now at stake. The shocking thing was that nobody had clearly set out the full scale of this threat in a way that the most powerful people in the world could understand and act on. What made me feel energised was that at least I had discovered something we could do better.

Bureaucracies, unfortunately, have a way of sapping people's energy, especially when it's suggested that something should be done differently. Frustratingly, those who opposed the idea of doing a new climate change risk assessment were unmoved by my stories of short-sighted soldiers, unconcerned insurers, and economists who said we'd be irresponsible to take them seriously. The same lazy objections kept being repeated. The leaders of the world might be unaware of the severity of the threat of climate change, but the people whose job it was to inform them didn't seem to think it was worth the bother.

My luck changed when the Foreign Secretary appointed Sir David King as his new Special Representative for Climate Change. Sir David had served

as the Government Chief Scientific Adviser, the most senior position at the interface between science and policy. When I pitched to him the idea of a project to assess the full scale of the risks of climate change and communicate this to world leaders, he immediately agreed. He recalled how in that previous role he had assessed the risk of a deadly virus spreading through the UK population. The probability of the outbreak was judged to be less than 1%, but the likely impact was estimated to be a very large number of deaths. Based on this risk assessment, the government of the day had taken swift and decisive action. To Sir David, the need for an equally clear assessment of the risks of climate change was obvious.

Over the following months, Dave (as I came to know him) and I assembled an international coalition of like-minded experts and advisers, committed to working together to assess and communicate the scale of the risks of climate change as fully as we could.

The core members of this coalition were senior advisers to the world's largest-emitting countries. Zhou Dadi is Vice-Chair of the China National Expert Committee on Climate Change, one of the most respected energy policy experts in China, and so dedicated to his work that despite being in his seventies, he could outlast me in staying awake through presentations on tidal energy technologies even after a ten-hour flight. Qi Ye is perhaps the most globally recognised expert on China's emissions. Dan Schrag, Director of the Center for Environment at Harvard University, sat on the President's Advisory Council on Science and Technology and had personally briefed Barack Obama on climate change. Arunabha Ghosh, Director of the Council on Energy, Environment and Water in Delhi, is one of India's most influential climate policy experts.

Around this core, our coalition eventually grew to over sixty experts from eleven countries, including scientists, economists, technologists, health experts, intelligence analysts, and military chiefs. All worked together, most contributing their time without payment, to produce a new model risk assessment. All were driven by the conviction that an important truth needed to be told.

When a year and a half later we started writing up our assessment,³ we began with the question that had almost prevented the project in the first place: why do we need a risk assessment? We answered it as follows.

Our starting point is that we have an interest in understanding what the consequences of our decisions might be. When the consequences could be so far-reaching in space and in time, we have an interest in understanding them as fully as possible.

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A risk is something bad that might happen. A risk assessment asks the questions: 'What might happen?', 'How bad would that be?' and 'How likely is that?' The answers to these questions can inform decisions about how to respond.

Climate change fits the definition of a risk because it is likely to affect human interests in a negative way, and because many of its consequences are uncertain. We know that adding energy to the Earth system will warm it up, raising temperatures, melting ice, and raising sea levels. But we do not know how fast or how far the climate will warm, and we cannot predict accurately the multitude of associated changes that will take place. The answer to the question 'How bad could it be?' is far from obvious.

Limiting climate change will take some effort. Although many of the policies that would reduce greenhouse gas emissions could also be good for public health, quality of life, and economic growth, they will not necessarily be easy to put in place. They will require the investment of both political and financial capital. Governments and societies will have to decide how much effort they are prepared to make, and how to prioritise this issue in relation to their other objectives. An assessment of the risks will be a necessary basis for judging what would be a proportionate response.

It is sometimes argued that a full assessment of the risks of climate change would be counter-productive, because the risks may be so large and the solutions so difficult that people will be overwhelmed with a feeling of helplessness, and will look the other way. In some cases, this may be true. The geographer Jared Diamond, in addressing the question 'Why do some societies make disastrous decisions?', writes:

... consider a narrow river valley below a high dam, such that if the dam burst, the resulting flood of water would drown people for a considerable distance downstream. When attitude pollsters ask people downstream of the dam how concerned they are about the dam's bursting, it's not surprising that fear of a dam burst is lowest far downstream, and increases among residents increasingly close to the dam. Surprisingly, though, after you get just a few miles below the dam, where fear of the dam's breaking is found to be highest, concern then falls off to zero as you approach closer to the dam! That is, the people living immediately under the dam, the ones most certain to be drowned in a dam burst, profess unconcern. That's because of psychological denial: the only way of preserving one's sanity while looking up every day at the dam is to deny the possibility that it could burst. Although psychological denial is a phenomenon well established in individual psychology, it seems likely to apply to group psychology as well.⁴

Our premise for writing this risk assessment is that we can all choose whether or not to look up at the dam. Governments can choose either to ignore it, or to send their best experts to inspect it closely. We have taken the view that it is better to be well informed than not. As the American

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nuclear strategist Albert Wohlstetter wrote during the Cold War, '*We must contemplate some extremely unpleasant possibilities, just because we want to avoid them.*'

So how well are we doing, then, at contemplating those extremely unpleasant possibilities?