

An Interview with Michael E. Mann: Fighting for Science Against Climate Change Deniers' Propaganda

Michael E. Mann and Benedetta Brevini

In 1998, Michael E. Mann developed the so-called 'hockey stick' graph, which revealed sharply higher global temperatures after 1900, to fight against climate change denialism. His most recent work, *The Madhouse Effect*, sees him teaming up with political cartoonist Tom Toles to satirise the twisted logic of denialists.

CLIMATE CHANGE—THE CURRENT SITUATION

Benedetta Brevini: The third page of the latest COP 21 Paris agreement acknowledges that the new CO₂ target won't keep the global temperature rise below 2 °C, the level that was once set as the critical safe limit. What can be done? Is there still a chance for us to do enough to limit the impacts of climate change? And why was the 2 °C so important?

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MM: It's true. And there's been a fair amount of coverage about what the pledges actually buy us in terms of curtailing further warming. And you can tally up the net effect of all the pledges—it gets us about half way from business as usual, which would be 5° by the end of the century. It gets us half way to two degrees—it gets us in the middle, around 3.5°. It doesn't get us down to that two degree mark, which is what many scientists say is the level at which we experience even more dangerous impacts of climate change. But it gets us on the path. The idea is that Paris alone isn't going to solve the problem, but it creates a framework that can be built on further with further reductions at the next conference—major conference of the parties, which hopefully can get us below 2°.

Ultimately, any amount of additional warming is bad. So there's no really fixed level that sort of divides safe and dangerous. It's really more an ever-steeper downward slope rather than a cliff. And further we head down that slope, the further we go down that highway, the worse things get. And we want to take the soonest, earliest exit that we possibly can off that highway. So 2 °C warming relative to pre-industrial is the result of somewhat subjective assessments—when you look across the various sectors that climate change impacts—food, water, health, loss of coastal property, the economy, a whole host of metrics of climate change impacts—and you look at the various studies that have been done estimating how those impacts depend on warming, you find that above 2 °C is where all the impacts really start to look negative. At less warming there's actually the possibility that some impacts are minimal or even slightly positive, but once you get above 2 °C warming, that's where pretty much all of the assessed impacts start to look negative and so you're looking for some reasonable line in the sand to draw where we can say we really see the worst impacts of climate change. Two degrees Celsius is pretty reasonable.

BB: I understand that. Reading 2036 and 2038 as the deadline for us seems dangerously close.

MM: Yeah I know, that's right. For us to continue as business as usual with burning of fossil fuels—we pass that two degree threshold very quickly. So without any action we will cross that threshold in a matter of a couple of decades or less.

BB: In your new book you address the problems of geoengineering as a proposed solution to the climate crisis. What are the issues with this, as you see it?

MM: The title of our book is *Geoengineering*, or “*What Could Possibly Go Wrong?*” And it really raises the issue of unintended consequences. Experiments that have been done show that iron fertilisation doesn’t work very well. That it causes a more rapid cycling of carbon through the atmosphere and the upper ocean, it doesn’t bury it permanently in the deep ocean, which is what you need if you’re going to take the carbon out of the system. Moreover, the iron fertilisation of the ocean appears to preferentially favour some of the more dangerous algae—like the algae that cause red tides, so it’s really an excellent example of how we can end up doing far more damage than if we had not engaged in those interventions at all. So I’m very wary of the vast majority of geoengineering schemes.

There’s one that’s relatively safe—it’s called direct air capture and basically it’s trying to suck the CO₂ back out of the atmosphere, so you’re not really tampering with the climate system in a way that these other schemes are. But it turns out it’s really expensive to do that energetically and economically and so probably the only situation in which it might make sense would be if we find ourselves in a situation where we’re going to go past one of those dangerous limits and there’s nothing we can do—it’s too late. Then some argue we need to look for a so-called ‘stop gap’—some immediate intervention that we can pull out of a hat and maybe something like direct air capture could be that. But these other geoengineering schemes could lead to far more dangerous impacts on the climate and on our environment and they’re more likely to do harm than do good. So my view is that scientists have the same ethical responsibility as doctors—first we should do no harm, that should be our pledge—and geoengineering violates that.

SCIENTISTS AS PUBLIC COMMUNICATORS

BB: What should be the role of scientists in society?

MM: I think it’s important to have individuals within scientific communities who are committed to communicating science and its applications. That doesn’t mean that all scientists should talk to the media. I know quite a few who would probably never talk to the media. But we do need to provide incentives and support at an institutional level for scientists who want to engage in what I consider to be a very noble undertaking of communicating science to the public. If they don’t do that, if there aren’t scientists who are willing to play that role, we create a vacuum that

becomes filled by the forces of disinformation and denial. And so it's really incumbent upon us to do that. But with that being said, not all scientists should communicate to the media or engage in outreach in general to the public—because a lot of scientists are sort of at their best when they're communicating with their colleagues and they know that if you start using scientific jargon and shorthand in your communications to the public, that is not very effective. And so I think those scientists who do communicate need to learn and understand and train in the rules of effective communication, not dumbing the science down but communicating it clearly, in non-technical terms, without giving abbreviations and jargon.

BB: What can the scientist community do to communicate more effectively? Could you comment on your own experience of operating your blog?

MM: I think social media is a very valuable tool for outreach and communication, but there's no one tool in my mind that serves all roles. Twitter only has 140 characters. You can link to an article or something else that provides more context but it's a very fast-paced, on-the-cuff, real-time means of communicating in short soundbites. There is a need for more context. There is a need for pieces that provide far more background, for more content, far more nuance—and you can do that with a blog or by writing commentaries for various online media outlets. I do a fair amount of that—I just had something in the *Guardian* the other day. And there are so many other ways we can communicate: giving public lectures, writing books—as we both have done—trying to explain the issues to the public. And all of these means of communication are complementary. To me they're a part of a larger portfolio. A portfolio of communication. You need a variety of tools in that portfolio to be able to serve all the various roles.

I don't think science journals in general are accessible to most people. Even the generals that try to do that, like *Nature* and *Science*, where at least the first paragraph is supposed to be understandable to a lay audience—or the IPCC reports, the reports of the Intergovernmental Panel on Climate Change. The problem is when scientists think they're being accessible, they're not. They're just being a little less technical than they would normally be. What a scientist views as non-technical and jargonless communication is very different from what we mean in the world of actual communication, when we say non-technical.

But it's important to publish peer-reviewed articles and peer-reviewed science is ultimately what supports much of one's communication efforts—

which is to say that when you're talking about a particular topic, what's the relationship between the extreme heat we've seen in Sydney and this winter and climate change, we can draw upon this peer-reviewed literature. It's there to provide support for the points that you might make, and moreover, if you want to have credibility as a science communicator that comes in part from having your peers respect you. Having them be familiar with your peer-reviewed work. And that process of publishing peer-reviewed literature and doing science is very important in grounding you. Keeping one foot in the world of scientific research I think makes you a better communicator, in part because it helps to ensure you're familiar with the cutting edge of where the science is. And if you're not immersed in the literature, you're not going to be.

ATTACKS ON SCIENCE

BB: In 2009 your emails were hacked and used by climate change denialists and mining/oil lobbies to discredit climate science. Several years later, no wrongdoing was found on the part of the scientists.

MM: You have to recognise that the attacks happened in the lead up to the Copenhagen summit in 2009. They were designed simply to hijack the discussion at Copenhagen. The investigations—eight, nine, ten of them—that found that there were no improprieties revealed in the stolen emails played out over several years and in the meantime climate change deniers were able to exploit the scandal for all its worth.

BB: And we lost almost decades.

MM: We lost almost a decade and we continue. It's an attack that can be used over and over again in part, because we have a media that in many cases isn't doing its job and just plays along with the whole false balance. We'll just put it out there—put both sides out there and that doesn't serve the public good.

DEALING WITH THE MEDIA

BB: That's interesting. I tend to blame the commercial media for their lack of understanding of environmental issues, their lack of expertise. Lack of funding sometimes ... so what do you think, in general, of the media coverage?

MM: It's varied. I think there are great media outlets. I've had good experiences here in Australia with the ABC Radio show that I did; the Sydney Morning Herald, a wonderful newspaper with Peter Hannam—a really great guy. There's another person at Sydney Morning Herald—a science person I've talked to before. So they do a really good job. I think the *New York Times* in the US has been doing a pretty good job in covering climate issues. MSNBC, in terms of our cable networks, has done a really good job. CNN has not done a really good job. FOX News is actively promoting misinformation and disinformation, but yeah, you can point to sources and journalists who are doing a really good job. I think the problem is, with the changes in the media environment, there are fewer and fewer positions for those sorts of journalists. Fewer resources—they're understaffed. They don't have the resources that they used to have to do really hard-hitting investigative journalism. That takes resources to be able to do that.

I think we've lost something in the fragmentation of our media. It has made it really difficult for the scientific community to clearly get its message out because it's so fragmented, and you have a variety of media outlets with varying levels of facilitating and accurately reporting science-themed stories. So it's a tough environment and it's, in my view, some of these problems that have led to the fact that technical issues that are contentious, like climate change, too often get treated with false balance. Because you know the journalist, the reporter, doesn't have the resources to investigate who's right and who's wrong—to fact check, to do the investigative work that's necessary ... they often end up resorting to sort of the default, which is there are two sides—and we'll just present these two sides.

BB: Do you have solution for that? Do you think there is a solution—to stop the media from thinking like that?

MM: Well Donald Trump has a solution. He wants to imprison all journalists except FOX News. I think that it's difficult because of the corporate media environment. I personally know of many cases where a journalist wrote an article, and I spoke with the journalist and had a sense that they were going to write a really good article. The article appears, it's got some problems, and there's some fake balance—and they throw in the quotes of some industry group and in many cases what you learn is that wasn't the journalist. That was their editor.

BB: You always have to please the editor.

MM: And editors are a part of management. So journalists are sort of workers and the editors are management, it's sort of the same workers and management divide. You don't want to blame the workers because they're doing what workers are meant to be doing. In many cases the blame goes to the management.

CONTRIBUTING TO POLICY MAKING

BB: It's a not a fair marketplace. In general, when you see that policymakers don't take your advice and don't take into consideration your findings and your studies. How does it make you feel?

MM: Again, it's varied. There are a lot of really good policymakers that I've advised. Jerry Brown, the Governor of California, I've been an advisor to him and he's doing wonderful things with renewable energy and climate change: putting a price on carbon, helping the former coalition of Western states to price carbon, incentivising renewable energy. And he's taken on Donald Trump and the rhetoric that Trump has been using when it comes to climate change. Jerry Brown is sort of a pitbull; he's fought back against efforts of Congressional Republicans to misrepresent the science. Sheldon Whitehouse, a senator of Rhode Island, is sort of again a pitbull on the senate floor—every week giving a speech about climate change; calling out climate change denialism. Whether or not anyone's willing to listen to him, he's down there on the Senate floor. So there are still some really good politicians in the US and elsewhere who understand the threat that climate change represents and want to act and do something about it. There are even a few on the Republican side of the aisle who quietly support action but are afraid of putting out and saying so as they'll be vilified by the very same fossil fuel interests we've been talking about.

At the other extreme, you have politicians who are just mouthpieces for the fossil fuel industry. Their campaigns were funded by the fossil fuel industry; they have close personal ties, some of them even benefit directly—financially—from the fossil fuel industry. Just about every individual who has been appointed to the Trump's administration and cabinet at this point is a climate change denier and has close ties to the fossil fuel industry. Like Rex Tillerson, the Secretary of State, the CEO of Exxon Mobile.

CONTESTED FUTURES

BB: Before Trump, just after the climate summit, there was a bit of optimism. So how do you see the future now? Do you think this wave of optimism has been stopped by Trump?

MM: I think that there are a number of things going on. Firstly there's progress at the global level and that's really important: regardless of what Trump does, you can't stop the momentum that now exists for progress on climate change—for transitioning away from fossil fuels towards renewable energy. The rest of the world is going in that direction and there's nothing that Trump can do to stop that. What he can do is make the challenge a little harder. Delay. And in so doing make the challenge even greater to limit warming below dangerous levels. The amount of carbon that will put us over the edge if the US pulls out of the Paris accord, for example, will make it even more difficult for us to stay within our carbon budget. That having been said there's a lot of hard work that is happening still at the municipal level, the state level, business that are committed to lowering their carbon footprint.

BB: There are the campaigns as well

MM: The campaigns—absolutely. Getting major corporations and politicians to divest holdings from the fossil fuel industry. So there are all of these good things that are happening and, to me, they signify that we will ultimately prevail in this battle. The question is will we allow Trump and other bad actors to slow progress down enough that a lot more bad impacts are observed. That we commit to worse climate change impacts. That's my fear. Ultimately it won't prevent us from solving the problem, but it will ensure that we commit to more harm and damage and suffering than we otherwise would have.



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