

Time for a different story

We can't wait for the next generation to solve climate change, but today's kids can still be a big driving force, says **Michael E. Mann**

WHEN my daughter was 5, I read *The Lorax* by Dr. Seuss to her. Much of it is about unrestrained development and damage to nature. It is sad, and she cried at times. But it is also hopeful. Its message is that, in the end, we have a choice – an opportunity remains to save our environment, but it is up to us to act.

My generation – in particular, our politicians – have so far failed to act sufficiently. We haven't done what is necessary to avert the threat posed by climate change. If fossil fuel use continues as now, we will warm our planet to dangerous levels within a few decades, having released too much carbon dioxide to avoid this. We cannot, as some hope, wait for a more environmentally aware generation to follow and solve the problem, as in *The Lorax*.

And yet children do have a role to play. They have the ability to



influence the environmental attitudes of adults for the better.

It is this potential to engage across the generations that helped inspire *The Tantrum that Saved the World*, a book I co-wrote with Megan Herbert, an accomplished children's author and illustrator. We have tried to create a mutual learning experience for parents and children.

Our hero is a girl called Sophia, who is upset by creatures appearing at her door. They have been displaced by the impact of climate change on their habitat and are searching for a new home.

At first, she is frustrated by the onslaught of uninvited guests. But as she learns their stories, she becomes increasingly concerned about them and sympathetic to their plight. She decides that she must do something. She makes signs and leads a demonstration, complains to local officials, rallies

Public spectacles

Can a second wave of smart glasses succeed where Google Glass failed, asks **Jamais Cascio**

ASK pundits what killed Google Glass's mass-market dream and they will list various issues, from price to style. But the most frequently cited by far came to be known as the "glasshole" problem.

It boiled down to this: eyewear sporting an obvious camera can trigger scorn or even violence. But it seems the idea of an everyday

facial computer based on glasses is too persuasive to go away.

Successors such as Intel's upcoming Vaunt were inevitable. It wisely has no camera, and is arguably the most normal-looking of any smart glasses – the specs just happen to have a Bluetooth connection to your phone and a low-intensity laser

to draw text onto your retina.

This is a relatively humble computer, suited to showing basic images and urgent messages. If this was all it could be, at worst it may be mildly disruptive to social interactions – "is this guy gazing into the distance thinking or checking his messages?"

Restrictions would probably be situational, such as banning them from exam rooms. In public, they would be unlikely to cause a stir.

But Intel already intends to add

"It is hard to imagine tiny lenses won't find their way to these devices. Would it be a privacy nightmare?"

a microphone in a more advanced version, and better graphics are also likely. As capabilities like this are added, social issues will once again multiply. Most critically, the absence of a camera is probably just temporary. Harder to spot lenses have cropped up on other smart glasses. But what happens when the camera is virtually impossible to detect at a glance?

It is hard to imagine that miniature lenses won't find their way to these devices. Would it be a privacy nightmare? Or to take a different cut at this, what might activists and demonstrators be able to capture with this kind of set-up? As with many information

friends and fellow townspeople, and ultimately takes her case all the way to the president.

As someone who is dedicated to conveying climate change science and its implications, I am always looking for new ways to talk about it and new audiences to reach out to. Younger children in the 5 to 10-year-old target age group for the book will enjoy the story on its own. Older children will also benefit from the book's second part, which provides some of the scientific backstory of how climate change is affecting the characters. The final third is an action plan detailing things to do to help solve the climate problem.

Messages of doom and gloom can be paralyzing. We wanted to tell a story that would empower, something that parents and children could read together and that might move them to act. We hope kids and adults alike will be inspired to become heroes of their own stories. An effort that spans the generations will be all the more powerful.

Michael E. Mann is distinguished professor of atmospheric science and director of the Earth System Science Center at Pennsylvania State University. *The Tantrum that Saved the World*, published by World Saving Books, is out in hardback next month

technologies, the capabilities that threaten privacy may also be tools of empowerment.

There's no guarantee that Vaunt (and its rivals) will be successful. Smart glasses may be a futurist trope akin to flying cars, appealing in the abstract, but with real-world problems too difficult to overcome. However, if they do thrive, we may be surprised by what happens next. Success based on eliminating a camera could, in turn, make cameras on our faces unstoppable. Glass began the debate, but it is far from over. **n**

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INSIGHT Air pollution



Is hairspray really wrecking the planet?

Michael Marshall

SAY air pollution and we tend to think of car exhausts, large factories and open fires. But in Western cities, it turns out the biggest source of air pollution is household items like your hair spray and shampoo.

A team including Brian McDonald and Jessica Gilman of the National Oceanic and Atmospheric Administration in Colorado examined data on air pollution from the US and Europe. Increasingly strict regulations mean that pollution from cars and other vehicles has fallen. As a result, a larger proportion of Western pollution now comes from everyday consumer products that release a mix of carbon-based chemicals into the air. To identify the types of product responsible, the team calculated the flow of chemicals in and out of the air of Los Angeles. The largest source was personal care products like hair spray, shampoo and deodorants, says McDonald. Other sources were paint and adhesives (*Science*, DOI: 10.1126/science.aaq0524).

"As many of these emissions occur indoors, and given the amount of time

spent indoors, there are potentially important health implications," says Frank Kelly of King's College London.

It is important to put these findings in context, however. They apply only to highly developed places like the US and western Europe, where air quality has been improving for decades, says Michael Brauer at the University of British Columbia in Canada. Emissions from consumer products are significant only because those from transport and industry have fallen.

For the locations in the world with the most severe air pollution problems such as China and India, the story

"Emissions from consumer products are significant only because those from transport have fallen"

remains unchanged, Brauer says. There, the main problems are "traditional" sources, like coal-fired power plants, wood, coal and dung burned for heating and cooking, and agricultural burning.

So the next time you see a report of horrendous smog in Delhi or Beijing, don't blame the shampoo. There is also

no reason to slow efforts to cut emissions from transport, both in the Western world and elsewhere.

But now we know that these everyday products are clogging up our air, what can we do about it? We can all make a difference, says Gilman. "Using the smallest amount possible to get the job done, or using fragrance-free products, are easy ways to reduce emissions." Even if this doesn't make much difference on a large scale, it may well improve the air in your home.

However, in the long run, public health specialists agree that new regulations must be passed to ensure that products emit less.

That may seem a daunting task, because the pollution is coming from such a wide range of products, but it is not impossible. For instance, many paints are now based on water rather than organic solvents, so hardly emit anything. Kelly also highlights the UK's recent ban on microbeads, an effort to tackle plastic pollution. "Changes can be made," he says.

Cutting these emissions may be a win-win situation, says Brauer. "The emissions are not waste products or by-products of combustion, but are essentially product that is being 'lost' to the atmosphere," he says. "Reducing their release during use means less of these compounds need to be produced." So manufacturers may ultimately make savings. Who knows, they might even pass them on to you. **■**