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In Whose Hands the Future?

Stephan Lewandowsky

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Abstract

Some issues that are uncontroversial within the relevant scientific community—such as the facts that HIV causes AIDS, that childhood vaccinations save countless lives, and that the globe is warming from human greenhouse gas emissions—are hotly contested in public. In some cases, the opposition to well-established science crosses the boundary from skepticism to denial. Science denial is characterized by several common attributes that are explored here and that are illustrated with a particular focus on how scientists themselves are affected by denial. The illustration uses the author’s own experience with attempts to suppress and silence his research on the drivers of climate denial. Although this is a personal story, it has implications for the scientific community and scientific institutions.

“Lewandowsky, Jew, Psychologist! Shut the fuck up you Nazi Zionist Kike!”
– From the author’s inbox

Some scientific propositions are so well established and supported by so much rigorous evidence that they are legitimately referred to as “fact.” The late Stephen Jay Gould defined a fact as being “confirmed to such a degree that it would be perverse to withhold provisional assent” (cited in Gregory, 2008). The U.S. National Academy of Science declared it a “fact” (National Academies of Science, 2010) that greenhouse gas emissions from human economic activities are altering the world’s climate, with potentially severe adverse consequences on our global community.

And yet, even though climate change and its anthropogenic origins are no longer debated in the relevant scientific community (Cook et al., 2013, 2016; Shwed & Bearman, 2010), a well-organized and well-funded political operation (Brulle, 2013; Oreskes & Conway, 2010) has vociferously opposed both policies to mitigate the risk from climate change as well as the science underpinning the need to act.

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I became interested in climate change in 2009, when public “skepticism” appeared to increase dramatically in the lead-up to the United Nations Climate Change Conference in Copenhagen. I had just completed research about how people processed information relating to the invasion of Iraq in 2003 (Lewandowsky, Stritzke, Oberauer, & Morales, 2005, 2009). Our research identified skepticism about the motives underlying the war as a key predictor of accuracy of information processing. People who were skeptical of the U.S. Government’s official reason for the invasion, namely to rid Iraq of Weapons of Mass Destruction (WMDs), were found to be better able to reject false information and accept true information than others who accepted WMDs as the *casus belli*.

I therefore approached climate “skepticism” with more than an open eye—on the contrary, I expected the “skeptics” to be incisive and trenchant in their critique. It took very little time for me to realize, however, that climate “skepticism” had nothing to do with skepticism and everything with politics. I was particularly struck by the conspiratorial content of much “skeptical” discourse on the internet, with its abundant references to the United Nations, a World Government, and scientists being “in it to get their grants renewed to line their pockets”, and so on. Now, if there is one thing I know, it is that scientists do not line their pockets with grant money.

Intrigued by this distortion of public discourse, I entered the fray by publishing an opinion piece on the website of the Australian Broadcasting Corporation (ABC; Lewandowsky, 2010a) in which I argued that, in scientific matters such as climate change, “the only balance that matters is the balance of evidence rather than of opinion” and that “balance in media coverage does not arise from adding a falsehood to the truth and dividing by two. Balanced media coverage of science requires recognition of the balance of evidence.” This piece attracted more than 2,000 comments and triggered a personal and professional trajectory that took me from studying the basics of human cognition via computer modeling to the center of the public and scientific fray surrounding climate change and climate denial.

The most gratifying consequence of this first opinion piece, and the response to it from within the Australian climate science community, is that I became interested in basic climate science and climate modeling. Much to my surprise I discovered that computational and mathematical models of cognition are not altogether dissimilar from models of the climate system. Scientists explore the brain and the planet with surprisingly similar statistical and computational techniques. My new-found scientific interest stimulated a fruitful and on-going collaboration with climate scientists (e.g., Lewandowsky, Risbey, Smithson, Newell, & Hunter, 2014; Lewandowsky, Risbey, Smithson, & Newell, 2014; Lewandowsky, Oreskes, Risbey, Newell, & Smithson, 2015; Lewandowsky, Risbey, & Oreskes, 2016, 2015; Lewandowsky, Freeman, & Mann, 2017; Risbey et al., 2014; Risbey, Lewandowsky, Hunter, & Monselesan, 2015; Risbey & Lewandowsky, 2017).

An even more instructive, though at times not always gratifying, consequence of this first public contribution to the climate debate involved my introduction to the netherworld of climate denial and its often brutish, thuggish, and toxic manifestations. This chapter tells that story.

Encountering the Silencers

The public debate about climate change rarely highlights the positives, known as co-benefits, that can arise out of tackling climate change by cutting greenhouse gas emissions. Extending people's lifespans by cutting pollution might seem to be an attractive proposition to most people. I made those points in another opinion piece for the ABC (Lewandowsky, 2010b) that compared the potential risks of climate mitigation with those of business as usual. To my surprise, this piece was followed by what would turn out to be the first of by now innumerable complaints to my host institution at the time, the University of Western Australia (UWA). The details of the complaint are not known to me, although I understand that the complainant demanded that the University take out full-page ads in national and regional papers with an apology for my opinion because, in the complainant's view, as a cognitive scientist I was not entitled to comment on the risk trade-offs between climate mitigation and continued business-as-usual (the issues in my opinion piece were eventually discussed in two peer-reviewed papers; Lewandowsky, Risbey, Smithson, Newell, & Hunter, 2014; Lewandowsky, Risbey, Smithson, & Newell, 2014). The complaint was dismissed, but it set the stage for what can only be described as a campaign to silence or embarrass me over the years to come.

Early in 2011, out of the blue, I received an email from a person who called herself Alene Composta, which opened thus:

Dear Prof Lewandowsky, We have never met, although we do share a background in the field of psychology, so I feel emboldened to ask for your professional advice. You see we have something in common: a passionate concern for averting the looming catastrophe of runaway climate change.

I recently began blogging, especially about climate change, and after a month my site was noticed. Noticed by the wrong people, sadly. Readers of Tim Blair and Andrew Bolt [two Australian tabloid personalities] have swamped my site with genuinely abusive comments, many relating to my disability, which I find very hurtful.

So my question to you is this: How do you deal with monsters like this?

I have read and savoured every column you have published . . .

I'm a fragile woman and I thought my blog, *Verdant Hopes*, might be a force for good in the world. Instead it has made me a victim once again.

Any advice you could share would be appreciated.

I am no fan of hyperbole such as the "looming catastrophe of runaway climate change," and a visit to Alene's blog left me with mixed feelings. Nonetheless, because I had by then become familiar with the effects of hate speech, I replied:

Yes, I know all about those abusive comments and it is brave for you to reveal as much personal detail as you do on your blog. Alas, for some people that is an invitation to rip into you and get a laugh out of that—they are like the school bullies whom no one really liked and who didn't really have close friends, only followers.

I deal with those comments and actions largely by ignoring them. . . .

As far as your blog is concerned, bear in mind that it is yours and that you can shut down any comment and run any moderation policy that you want. That still doesn't

make it easier to receive those hateful utterances in the first place, but at least it gives you some sense of control to shut them down. Bear in mind that a proportion of those comments is orchestrated and for all we know there are only a handful of people with multiple electronic ‘personas’ each, who are paid to create disproportionate noise.

The final sentence turned out to be particularly prescient, because a short while later the entire exchange appeared on the internet and it transpired that “Alene” did not exist. She was a “sock puppet”; that is, an internet persona created by persons unknown whose motives appeared a little different from “Alene’s” intent to “be a force for good in the world.” The publication of my exchange with “Alene” stimulated much hilarity among blog commenters about how anyone could be gullible enough to believe that a seemingly troubled and challenged person was actually a troubled and challenged person. By a further leap of logic, my “gullibility,” in turn, was taken to disprove the science underlying climate change.

Intrigued by my exposure to some of the discourse and actions of people involved in climate denial, I conducted a survey of visitors to climate blogs in late 2010 that polled their attitudes to various scientific propositions, such as climate change, and that also probed their political attitudes and their belief in various conspiracy theories such as “A powerful and secretive group known as the New World Order are planning to eventually rule the world . . .”. The in-press paper and data for this study (Lewandowsky, Oberauer, & Gignac, 2013) became available for download in July-August 2012. I thus refer to this paper as LOG12 from here on.

In replication of much existing research (e.g., Heath & Gifford, 2006; Kahan et al., 2012), the survey identified political ideology—in particular, the extent of endorsement of laissez-faire free-market economics—as being the principal driver of the rejection of climate science. Another, but quantitatively less-pronounced factor associated with the rejection of climate science involved the belief in various conspiracy theories. The more people endorsed the threat of a New World Order, or other conspiracies such as Princess Diana being assassinated by members of the British royal family, the less they were willing to accept the findings from climate science. This observed association meshes well with related findings by Smith and Leiserowitz (2012), who found that among people who deny climate change, up to 40% of affective imagery invoked conspiracy theories. That is, when asked to provide the first word, thought, or image that came to mind in the climate context, up to 40% of responses would be “the biggest scam in the world to date”, “hoax”, or similar. The association in our survey also meshes well with a body of prior research that has linked conspiracist ideation to the rejection of science (Diethelm & McKee, 2009; Goertzel, 2010; Kalichman, 2009; McKee & Diethelm, 2010) and the acceptance of pseudoscience (Lobato, Mendoza, Sims, & Chin, 2014). Moreover, the link between conspiracist ideation and rejection of science in LOG12 was eventually replicated by our team with a nationally-representative sample of Americans (Lewandowsky, Gignac, & Oberauer, 2013).

Although the results of LOG12 were unsurprising to anyone familiar with research on science denial, the impending publication of the paper was met with intense behind-the-scenes efforts to suppress its publication and to have me sanctioned by my university. The editor of the journal that published LOG12 was almost immediately approached by numerous complaints about the paper that eventually escalated into requests to retract the

article. An early summary of those events was reported elsewhere (Lewandowsky, Mann, Bauld, Hastings, & Loftus, 2013; Sleek, 2013), although attempts to effect a retraction of LOG12 continued at least until late 2014. As noted by Sleek (2013), the critics were invited to submit a commentary for publication in the same journal (*Psychological Science*), but none acted on that invitation. Eventually, a critique of LOG12 and its companion paper (Lewandowsky, Gignac, & Oberauer, 2013) was published (Dixon & Jones, 2015), together with a rebuttal (Lewandowsky, Gignac, & Oberauer, 2015b), but I am not aware of those authors being involved in approaches to the editor when LOG12 first appeared.

In an ironic twist, accusations of ethical impropriety were launched against me vis-a-vis the journal when a Freedom-of-Information (FOI) request revealed that LOG12 was conducted *with* ethics approval. The allegation, made by a blogger operating outside any accountability mechanisms, rested on the fact that ethics approval was granted expeditiously via amendment (as is routine practice for low-risk research). Another ethical complaint, launched nearly two years after publication of LOG12, invoked the fact that our consent forms did not advise participants that their data would be disregarded during analysis if they only partially completed the survey. Complaints about LOG12 were also made to the publisher of the journal, the Association for Psychological Science. It is my understanding that further complaints were addressed to various national or international bodies, although I am not privy to those details.

Over time, those contrarian activities expanded further in scope. I was eventually contacted by several journalists who had reported on the findings of LOG12 when it first appeared, and who had been approached by an individual demanding the retraction of their news stories because of alleged flaws in LOG12.

As these events unfolded, I learned through colleagues among climate scientists that those tactics of approaching editors with repeated complaints—which can cross the threshold into intimidation—are quite common. I eventually learned of 7 journals across a number of disciplines whose editors had been approached (or bullied) in this manner. Little did I know at the time that these events were just mild precursors of things to come.

In parallel to those approaches to the journal and publisher, numerous similar or identical complaints were launched with the University of Western Australia. None of those complaints were upheld. One open question is the extent to which these complaints were coordinated. In the case of tobacco research there is clear evidence that complaints about academics to their institutions are not random but highly organized (Landman & Glantz, 2009). In my case, I have no direct evidence for coordination although it is possible that those complaints were encouraged or at least facilitated by the public posting by a blogger of the name and email address of the executive at UWA responsible for research integrity.

When I moved to the U.K. in 2014, my new host institution, the University of Bristol welcomed my move by announcing that I was the recipient of a Wolfson Research Merit Award from the Royal Society. This triggered several complaints to the university (for having hired me), including harassing phone calls to administrative staff in the School of Psychology that necessitated managerial counselling. Some blog commenters suggested that I was “fleeing” Australia as a consequence of (unspecified) investigations.

Encountering Conspiracist Discourse

In addition to those behind-the-scenes events, LOG12 engendered considerable discursive activity on “skeptical” internet blogs when it first appeared in 2012. After a few days with growing reverberations in the blogosphere, it became apparent to me that the public response to LOG12 might be relevant to the scholarly question regarding the involvement of conspiracist discourse in the rejection of science. Our team thus commenced a research project that analyzed this public blogosphere discourse.

We monitored the content of a number of prominent climate-“skeptical” blogs (from here on, we refer to that as the blogosphere for short) and catalogued the hypotheses about LOG12 that were advanced during that discussion. We then classified each of those hypotheses according to criteria for conspiracist ideation that we extracted from the existing literature. At least 10 such hypotheses were identified. To illustrate, the most frequently cited hypothesis was that the LOG12 responses were “scammed” by participants who “faked” their responses to deliver a “desired” outcome. This hypothesis took on increasingly elaborate forms over time and identified an increasing number of “faked” responses in the data. Without rigorous *a priori* specification of what constitutes faked responses, the scamming hypothesis is in principle unfalsifiable: there exists no response pattern that could not be considered fake by an innovative theorist. This potentially self-sealing reasoning constitutes one known attribute of conspiracist cognition (Lewandowsky, Cook, et al., 2015; Lewandowsky, Lloyd, & Brophy, 2018). Elements of the “scamming” hypothesis also exhibited a possible incoherence that is characteristic of conspiracist discourse (Lewandowsky, Cook, & Lloyd, 2016; Wood, Douglas, & Sutton, 2012), for example by referring to the data from LOG12 simultaneously as being “badly-collected” and “totally-invented.”

The second illustrative hypothesis focused on the statement in the Method section of LOG12, that “links [to the survey] were posted on 8 blogs (with a pro-science stance but with a diverse audience); a further 5 ‘skeptical’ (or ‘skeptical’-leaning) blogs were approached but none posted the link” (Lewandowsky, Oberauer, & Gignac, 2013, p. 624). Speculation in the blogosphere focused on the identity of those 5 “skeptical” bloggers. Within short order, 25 “skeptical” bloggers went on record that they had not been approached by the LOG12 team. Five of those individuals were invited to post links by the LOG12 team in 2010, and two of them had engaged in correspondence with the LOG12 research assistant. One individual airing the suspicion that “skeptical” bloggers had not been contacted also provided the email address to which allegations of research misconduct could be directed at UWA. This individual had been contacted twice by the research team.

After the identity of the 5 bloggers became publicly known, the specific hypothesis that no “skeptical” bloggers were contacted faded from prominence, although transformed variants persisted in the blogosphere discourse. For example, the hypothesis that LOG12 sought to exclude “skeptics” from the survey persisted in the discourse even though the original basis for that inference had been shown to be invalid. This “self-sealing” persistence of contrary-to-fact claims constitute an acknowledged symptom conspiracist cognition (Bale, 2007; Keeley, 1999; Lewandowsky, Cook, et al., 2015; Sunstein & Vermeule, 2009).

The analysis of the blog-centered public response to LOG12 was published as a thematic analysis in an online open access journal (Lewandowsky, Cook, Oberauer, & Marriott, 2013). The thematic analysis was supported by citations, including links to the blogs

on which the material had been published, thereby rendering the source of those public statements identifiable. This article, entitled *Recursive fury: Conspiracist ideation in the blogosphere in response to research on conspiracist ideation* (*Recursive Fury* from here on) appeared to be the most-read article in psychology in that journal in an analysis conducted in late 2014, with approximately 65,000 page views and 10,000 downloads.¹ *Recursive Fury* also received some media attention, including in the *New York Times* (Gillis, 2013).

Recursive Fury: Overview of Events

By now, I was expecting the publication of *Recursive Fury* to elicit complaints to UWA and to the journal. What I did not expect at the time were the intensity and number of those complaints. Ultimately we had to respond to dozens of complaints by a relatively small number of individuals that were registered with the journal.²

As a result of those complaints, the journal first temporarily removed access to the article (shortly after its publication) and then instituted an academic, ethical, and legal review of its status. About a year after its publication *Recursive Fury* was retracted (in March 2014) for legal, but not academic or ethical reasons. The publisher deemed the legal risk under British libel laws that was posed by a non-anonymized thematic analysis to be too great.³ The following retraction statement, agreed and signed by solicitors of both parties, replaced the copy of the article on the journal's website:

In the light of a small number of complaints received following publication of the original research article cited above, Frontiers carried out a detailed investigation of the academic, ethical and legal aspects of the work. This investigation did not identify any issues with the academic and ethical aspects of the study. It did, however, determine that the legal context is insufficiently clear and therefore Frontiers wishes to retract the published article. The authors understand this decision, while they stand by their article and regret the limitations on academic freedom which can be caused by legal factors.

The University of Western Australia, where the work for *Recursive Fury* was conducted, came to a different risk assessment *under Australian law* and posted a copy of *Recursive Fury* at a dedicated URL (<http://uwa.edu.au/recursivefury>). The copy carried an affirmation of the University of Western Australia's commitment to academic freedom on its title page. In connection with the posting of the article, the University of Western Australia's General Counsel, Kimberley Heitman, stated publicly: "I'm entirely comfortable with you publishing the paper on the UWA web site. You and the University can easily

¹The journal's website has undergone a major redesign since then, and those figures were no longer accessible at the time of this writing. The analysis therefore could not be updated.

²It appears that the same (or very similar) set of complaints was lodged with UWA, although I am not privy to those details. UWA did not uphold any of those complaints.

³Our own legal advice concurred with this assessment under the British libel laws that had been in force at the time of publication of *Recursive Fury*. Because of the adverse implications of those laws on freedom of expression, the U.S. Congress passed a law in 2010 that recognized the adverse impact of foreign libel laws on the "ability of scholars and journalists to publish their work" (PUBLIC LAW 111223) and which made judgments under U.K. libel laws not enforceable in the United States. Those U.K. laws were reformed with effect of 2014, and they now include a specific exemption for peer-reviewed scientific articles, but those did not retroactively apply to *Recursive Fury*.

Figure 1. Overview of the various papers discussed in this chapter and their relationship and an approximate timeline.

be sued for hurt feelings or confected outrage, and I’d be quite comfortable processing such a phony legal action” (Lewandowsky, 2014c).

Recursive Fury was viewed and/or downloaded on the UWA website a further $\simeq 13,000$ times between March 2014 and July 2015. The University received no complaints or legal action in response to its public posting of *Recursive Fury* for over a year. In July 2015, a revised and greatly expanded version of the article was published in another peer-reviewed journal, at which point *Recursive Fury* ceased to exist.

Those various events deserve to be unpacked and presented in more detail. Figure 1 provides an overview of the various papers involved in this story and explains their relationship.

Because much of the affair involves confidential material, everything that follows is exclusively based on information that already entered the public record in 2014. This includes material that was obtained by illegal means (viz., a hacking attack on a website) but then became public through the actions of others. Because it is largely based on the existing public record, the story must remain incomplete, although I am confident that the following sections capture the essence of events.

The Complaints Against *Recursive Fury*

The complaints were confidential and I no longer have access to them as they were destroyed on legal instruction. However, it is a matter of public record that the complaints centered on the fact that our thematic analysis was supported by citation (via web links). This permitted identification of any individual who chose to make public statements using their own name and that were picked up by our search. Complainants considered this to constitute an ethical violation because we did not seek their consent before commenting on their public statement. Complainants also felt defamed by our analysis of their comments, arguing that this constituted “malice” on the part of the authors.

It is illustrative to examine how the case for “malice” on our part was constructed. This became possible because an investigative journalist used FOI to access some of the relevant documentation (Readfearn, 2014). I explored the implications of this as follows (Lewandowsky, 2014a):

In the present context, it is most relevant that the accusations of malice against John Cook, one of the authors of *Recursive Fury*, were based on his apparent sanctioning of ‘vile commentary’ against the complainant and other bloggers.

Indeed, the material cited in support contains irate statements that none of the authors of *Recursive Fury* would countenance.

None of the authors made those statements.

One will fail to find anything like those comments on Cook’s blog, www.skepticalscience.com: None of the more than 88,000 public comments posted there to date contain anything that could be remotely construed as vitriolic or polemical—that’s because 7000 comments were deleted by moderators owing to their inflammatory content.

So where did the ‘vile commentary’ come from and how did John Cook ‘sanction’ it?

The vile commentary was made by third parties unconnected to *Recursive Fury* on a private forum that was password-protected, and whose purpose was to permit open and completely uncensored discussion among a small group of collaborators. Those comments were posted in the expectation of privacy, and they became public only through a criminal act—a hack attack on *Skepticalscience*

John Cook neither wrote those comments, nor could he be reasonably expected to moderate them. They were made in private and became public by an illegal act by parties unknown.

What John did was to host a private forum on which other people vented their anger. If that is malice, then so would be inopportune comments by your friends at an illegally wire-tapped dinner party. You better censor what your guests say in case your next party is bugged, lest you be accused of malice.

The complainant’s conduct follows a common pattern in the Subterranean War on Science: Use of private correspondence obtained by an illegal act to construct allegations against scientists. Except that in this case, to allege malice against John Cook, hackers trolled through two years of his private conversations and found exactly nothing.

Zip. Zilch. Bupkis.

All the hackers and trolls could find were other parties expressing anger in the expectation of privacy. I cannot think of clearer evidence for the absence of malice in John Cook’s conduct.

I nonetheless think there might be evidence of malice here.

Maybe some readers can spot it.

My post concluded with the following question about the issue of privacy and public statements (Lewandowsky, 2014a):

Are public statements by people who knowingly made them in public, subject to scholarly analysis? Or is it only stolen correspondence by third parties made in the expectation of privacy that can be used to allege malice on the part of someone who never said anything malicious himself?

This question continues to be worthy of exploration. It turns out that a panel of experts was able to shed some light on this question at the time.

The Expert Panel

In response to the complaints against *Recursive Fury*, the journal convened an independent panel of experts (I do not know their identity) to evaluate the scientific and ethical integrity of the article. This report was critical of our work but ultimately advised against a retraction of the article on academic or ethical grounds.

The report remains confidential, but one important excerpt from the report concerning the issue of whether public statements can be used for scholarly analysis without anyone's consent became public under legal guidance (cited in Lewandowsky, 2014b):

The question of participant status is an important and complex one. It turns on the question of whether an individual's (identifiable or not) postings to blogs comprise public information and therefore do not fall under the constraints typically imposed by ethics review boards. The issue is currently under debate among researchers and publishers dealing with textual material used in scientific research. Advice was sought from the leading researcher on web-based psychological studies and his response was that 'among psychological and linguistic researchers blog posts are regarded as public data and the individuals posting the data are not regarded as participants in the technical sense used by Research Ethics Committees or Institutional Review Boards. This further entails that no consent is required for the use of such data.' Although this view is held by many researchers and their ethics boards, it is by no means a unanimous judgment and it is to be expected that legitimate challenges, both on ethical and legal grounds, will be raised as web-based research expands in scope. But to the charges that *Fury* was unethical in using blog posts as data for psychological analysis, the consensus among experts in this area sides with the authors of *Fury*.

My view on this issue is that scholarly analysis of public speech is an essential scientific and public good. The idea that it would not be permissible, say, to analyze the meaning and implications of President Trump's tweets without his consent (cf. Lewandowsky et al., 2018; Ott, 2017) is incompatible with democracy. Indeed, if taken to an extreme, the complaints against using citations in *Recursive Fury* without the author's consent would imply that no citation in a peer-reviewed article could ever occur without seeking consent

of the to-be-cited party, clearly an absurd proposition. This problem has been noted by others (e.g., Jones, 2014). In my view, public speech by actors who seek publicity—and who could choose to remain anonymous by using a pseudonym—is a public good that must be open for scholarly analysis.

That said, there are legal implications associated with interpreting and commenting on public speech. As I already noted, those played a major role in the events surrounding *Recursive Fury*.

The Legal Angle and the Replacement Paper

Having been informed by the journal that on the basis of their expert panel *Recursive Fury* would not be retracted for ethical or academic reasons, the journal indicated that changes would have to be made to the paper in order to safeguard against the legal risk of defamation. I agreed to this process, based on our own legal advice based on U.K. law, which supported the journal’s position, even though no such risk had been identified by the General Counsel of UWA under Australian law. Events then unfolded as follows (Lewandowsky, 2014d):

On 28 August 2013 I was informed by *Frontiers* that their analysis of the defamation risk—under English libel laws—had found the risk to be too great for the journal to carry the article, and that it would have to be retracted. This decision was accompanied by an invitation to submit a replacement article that dealt with the issues identified in the various reviews and assessments.

We submitted a replacement article on 1/1/14, by which time English libel laws had changed significantly.

This replacement article was prepared using a legal guidance document provided by the journal which requested that the thematic analysis be de-identified. We therefore anonymized the thematic analysis by paraphrasing verbatim public statements until they no longer yielded hits in Google. We also added two behavioral studies involving blind and naïve participants to buttress our thematic analysis. The new paper also included two additional authors, who were not associated with LOG12, and who independently confirmed the thematic analysis.

Frontiers rejected this replacement paper, arguing that it failed to deal adequately with the defamation issue. Our (English) legal advice at the time stated that defamation cannot arise if individuals cannot be identified in the minds of a “reasonable reader.” My view, and that of my solicitor, was that if authors of public statements cannot be identified via Google on the basis of paraphrasing, then no “reasonable reader” could infer their identity.

The journal came to a different risk assessment and *Recursive Fury* was retracted.

The Fury after the Fury

The withdrawal of *Recursive Fury* engendered a number of notable and sometimes surprising events.

In response to the retraction, three Editors of the journal publicly resigned in protest. A fourth editor provided a detailed critique of the journal’s actions (Jones, 2014).

The Australian Psychological Society issued a statement that expressed “dismay” at the withdrawal of *Recursive Fury*, stating that “this situation is greatly concerning on a number of fronts.” The Australian Psychological Society also congratulated UWA for its decision to host *Recursive Fury* on their website.

A similar public position was taken by the (American) Union of Concerned Scientists (<http://blog.ucsusa.org/michael-halpern/a-conspiracy-theory-researcher-falls-victim-to-conspiracy-theories-intimidated-journal-to-retract-lewandowsky-paper-457?>).

An NGO (*Forecast the Facts*) launched a petition calling for the reinstatement of *Recursive Fury* that attracted nearly 2,000 signatures.

At the other end of the spectrum, an anonymous team calling itself “NotStephan Lewandowsky” produced a YouTube parody ([https://www.youtube.com/watch?v=bL_QWRgj-k\\$](https://www.youtube.com/watch?v=bL_QWRgj-k$)) of the events surrounding *Recursive Fury* by subtitling the “rant in the bunker” scene from the movie *Downfall* (starring Bruno Ganz as Hitler/subtitled as Lewandowsky).

The retraction also found much echo in the global media (summarized in Lewandowsky, 2014d). To illustrate, one article cited *Frontiers*’s solicitor as stating that “Frontiers is concerned about solid science and it’s obviously a regret when you have to retract an article that is scientifically and ethically sound”. The tenor across many articles was one of the journal having “caved in” to climate deniers by retracting *Recursive Fury*. For example, one article that ran in the Sydney Morning Herald (one of Australia’s largest broadsheets) quoted UWA’s General Counsel (Hannam, 2014):

Kim Heitman, a lawyer for the UWA, said the university had done its own risk analysis before publishing the paper online. “There’s no reason to take it down,” Mr Heitman said.

The university had also received complaints from some groups. “It’s quite relentless,” he said.

“There’s always a close interest in everything that Steve (Lewandowsky) does,” Mr Heitman said. “We are conscious that we are going to be targeted by people opposed to his works.”

The university, though, had also received plaudits from around the world for its decision to publish the paper.

“I couldn’t list them,” Mr Heitman said. “And I wouldn’t list them, having regard to the fact that anyone who issues a ‘thanks UWA’ will probably get their own enquiry.”

The same article went on to quote one of the reviewers of *Recursive Fury*, Elaine McKeown, as stating that the journal had been “spineless”:

“They caved in at the first pushback from the climate change denial community,” Ms McKewon said.

“To retract a paper is just the most extreme action that a journal can take, and it was thoroughly unwarranted in this decision,” she said. “It was really quite breathtaking.”

This reviewer also published an opinion piece in *Scientific American* that related her experiences (McKeown, 2014a):

In any event, the journal's management and editors were clearly intimidated by climate deniers who threatened to sue. So *Frontiers* bowed to their demands, retracted the paper, damaged its own reputation, and ultimately gave a free kick to aggressive climate deniers.

I would have expected a scientific journal to have more backbone, certainly when it comes to the crucially important issue of academic freedom.

The fury after the retraction might have ended there. Unfortunately it did not.

Citing the intense media coverage, the journal issued a follow-up statement (http://www.frontiersin.org/blog/Retraction_of_Recursive_Fury_A_Statement/812) which, for the first time, alluded to ethical problems by stating: “Frontiers came to the conclusion that it could not continue to carry the paper, *which does not sufficiently protect the rights of the studied subjects*” [emphasis added]. This second statement also claimed that the journal had received no legal threats, and that our replacement paper had failed to conform to their instructions. I responded (Lewandowsky, 2014d):

Throughout the entire period ... the only concern voiced by *Frontiers* related to the presumed defamation risk under English libel laws. While the University of Western Australia offered to host the retracted paper ... because it did not share those legal concerns, *Frontiers* rejected an anonymized replacement paper on the basis that non-identifiable parties might feel defamed.

No other cause was ever offered or discussed by *Frontiers* to justify the retraction of *Recursive Fury*. We are not aware of a single mention of the claim that our study “did not sufficiently protect the rights of the studied subjects” by *Frontiers* throughout the past year, although we are aware of their repeated explicit statements, in private and public, that the study was ethically sound.

The fury after the retraction might have ended there. Unfortunately it did not.

The journal's Editor issued several further statements that expanded on the presumed ethical problems, culminating in the claim, “But there was no moral dilemma from the start—we do not support scientific publications where human subjects can be identified without their consent” (<https://blog.frontiersin.org/2014/04/11/rights-of-human-subjects-in-scientific-papers/>). This claim appears to be irreconcilable with the initial retraction statement, signed by the solicitors of the journal and the authors, that the journal “... did not identify any issues with the academic and ethical aspects of the study.” It also cannot be reconciled with the journal's own expert panel, cited earlier.

Those evolving discrepancies between the journal's various positions cannot be explained by outsiders. However, it can be noted that one of *Fury*'s reviewers wrote an opinion piece in direct response to the journal's increasingly divergent statements, which explained the issue in detail (McKeown, 2014b):

As a reviewer, I was privy to some of the earliest threats sent to the journal following the paper's publication. Email exchanges between the journal's management, legal counsel and editors and reviewers clearly demonstrate that the journal received threats and responded to them as threats...

This email exchange culminated in a conference call to enable the journal's manager, legal counsel, editors and reviewers to discuss how the journal should proceed. Let

me be perfectly clear: the very reason the journal convened the conference call was to deal with threats that had been received from climate denialists.

So the journal's claim that it "received no threats" is demonstrably false.

The reviewer's public comments are consonant with testimony on Twitter and on blogs, in which some of the actors openly bragged about how much time and effort they expended talking to editors on the phone, and in which some other actors clarified that they *had* threatened the journal with legal action.

Restoring Recurrent Fury

In 2015, our team published an article entitled *Recurrent Fury: Conspiratorial Discourse in the Blogosphere Triggered by Research on the Role of Conspiracist Ideation in Climate Denial* (Lewandowsky, Cook, et al., 2015; *Recurrent Fury* from here on). Except for changes made in response to (double-blind) peer review, this article was materially identical to the intended replacement paper for *Recursive Fury* that was submitted to *Frontiers* in response to their guidance document.

This article reported 3 studies that, again, examined the discourse in the climate-"skeptical" blogosphere in response to the publication of LOG12. The first study consisted of the thematic analysis that was the core component of *Recursive Fury*, albeit now anonymized and with paraphrasing of quotations to eliminate any legal risks. The second and third study were new and served the important purpose to provide independent and blind tests of our thematic analysis. The second study showed that when naïve judges (i.e., people who were not conversant with any of the issues and were blind to the purpose of the study) were asked to analyze the blogosphere content material, they reproduced the structure of hypotheses uncovered in our thematic analysis.

In the final study, naïve participants were presented with a sample of anonymized blogosphere content and rated it on various attributes that are typical of conspiracist discourse (for a derivation of those attributes, see Lewandowsky, Cook, et al., 2015; Lewandowsky et al., 2018). For each of several hundred such content items, participants were asked to respond to the following test items: "To what extent does the commenter believe that the scientists acted with questionable motives?" (Questionable Motives in Figure 2); "To what extent does the commenter express deep-seated suspicion?" (Suspicion); "To what extent does the commenter perceive himself/herself as a victim of scientists or research?" (Victim); "To what extent does the commenter firmly believe that there must be something wrong with the research?" (Something must be Wrong); "To what extent does the commenter offer a reasonable and well thought out criticism of the research?" (Reasonable Critique).

For comparison, the study also included material written by junior scholars (PhD students) who were instructed to be as critical as possible of LOG12. The PhD-generated content was randomly interspersed with blogosphere content in the sequence of trials for each participant. The results of this study are shown in Figure 2.

It is apparent that the ratings for blogosphere content (histograms) were skewed towards the high end of the various conspiracist attributes. To illustrate, for "something must be wrong" and "suspicion" the *modal* response was a 10 on a 10-point scale. The only attribute of blogosphere discourse that deviated from this pattern the "reasonable and well thought out criticism of the research" criterion, where the modal response instead was zero.

Figure 2. Histograms (dark gray) for all responses to *web* content (not averaged across trials within a participant) for all 5 questions in Study 3 of (Lewandowsky, Cook, et al., 2015). The dashed line that encloses the cross-hatched area represents Gaussian kernel density estimates (using 1.5 times the standard bandwidth) of the equivalent responses to PhD-generated content. See text for details. Figure reprinted with permission.

It is illuminating that the reverse pattern occurred with the PhD-generated material. In confirmation of their task to generate content that was as critical as possible of LOG12, the material generated by PhD scores was rated highly on the “reasonable and well thought out criticism” attribute. By contrast, it scored low or towards the center of the scale for the remaining conspiracist attributes.

Notably, these results (Figure 2) were obtained with anonymized material that was presented with no guiding context, to participants who knew nothing about the issue under consideration. The results clarify that the blogosphere’s activities relating to LOG12 failed to contribute any discernible scholarship or identifiable reasonable critique.⁴ The public stance of “skeptics” is that they contribute an important alternative perspective and significant scientific critique of actual climate science—and also LOG12. But the results of the third study (Figure 2) showed that their critiques were not considered, by blinded and naïve participants, to contribute anything to the scientific context or investigation.

This may be a good moment to invite the reader to guess about the likely course of events in response to publication of *Recurrent Fury*. At the institutional level, the paper

⁴After the events surrounding *Recursive Fury*, an unknown reader discovered an error in another publication (Lewandowsky, Gignac, & Oberauer, 2013). We re-analyzed the data and published a corrigendum (Lewandowsky, Gignac, & Oberauer, 2015a). Those errors did not affect any of the conclusions of the paper. I support open access to data (Morey et al., 2015) wherever possible (cf. Lewandowsky & Bishop, 2016), and the data for the core publications discussed in this chapter are all publicly available for re-analysis.

triggered complaints and claims of ethical violations, this time to the University of Bristol rather than UWA. The complaints were not upheld.

In parallel, the journal was again approached by multiple parties with complaints and allegations. The nature of those approaches by one particularly persistent individual were characterized by the handling editor as follows:

I received 4 e-mails from him recently (long and convoluted ones though, with many additional documents) . . . He called my department once or twice and told them to have me call him back, and he called my office number as well a few times . . .

I felt somewhat bothered by this as I had stated a few times that we don't see any problems with the article and its ethics and referred him to submit his complaints or a critical review elsewhere (or as a scholarly commentary to the journal) but he continued to email more and more detailed arguments. I haven't had any such reaction to articles before. And yes, I also *haven't experienced such persistence in reaction to my own work on contested issues including the Armenian genocide denial, Holocaust denial, the Israeli - Palestinian conflict, and the Rwandan genocide* [emphasis added]. I received a few individual emails by participants or readers, but never any follow up after that . . .

No commentary has been submitted by anyone to the journal for peer review. To the best of my knowledge, no efforts are currently underway to suppress LOG12 or *Recurrent Fury*. The reader is invited to speculate about what responses the present chapter might elicit.

Consequences of Conspiratorial Denial of Science

Because of the complexity of events, I briefly summarize the sequence of events that comprise the *Fury* affair (see Figure 1). *Recursive Fury* was published in the open-access journal *Frontiers* in 2013 and immediately became the target of complaints and legal threats, while also becoming one of the most widely-read publications in the journal. Eventually, as clarified in an agreement signed by solicitors of all parties involved, *Recursive Fury* was retracted by *Frontiers* because of legal concerns but not for academic or ethical reasons. An exact copy of *Recursive Fury*, that differed from the originally-published version only by an affirmation of the University of Western Australia's commitment to academic freedom, was then posted on the UWA website for approximately a year. During that time it received a further 13,000 downloads. An anonymized and expanded paper that *Frontiers* had also deemed to be unsuitable for publication, appeared after double-blind peer review in the open-access *Journal of Social and Political Psychology* in 2015. This new paper, *Recurrent Fury*, has by now been downloaded nearly 12,000 times and the journal's editor declined to indulge in attempts to suppress the paper. Throughout this three-year affair, UWA and the University of Bristol, my two host institutions during this period, received innumerable complaints, none of which were upheld. At no time did anyone involved in the campaign against me and the two *Furies* submit anything for peer review to any journal. At no time was any legal action taken against a university or journal involved.

What are the consequences of the events just described? What are the effects of such insertions by external parties into the scientific process? I differentiate between the personal

consequences I experienced, those that affect the scientific community in general, and the effects at an institutional level.

At a personal level, my initial feeling about the blogosphere response to LOG12, and the events leading up it, was a sense of puzzled bemusement. Engaging in a conversation with a non-existent “sock puppet” (Lewandowsky, 2011) seemed bizarre (and creepy) at the time, but those feelings were twinged with the recognition that the event entailed a small component of juvenile humor. Similarly, receiving a Facebook friend invitation from an unknown person who tried to impersonate a well-known climate scientist was creepy but seemed harmless at the time. Thus, when 25 bloggers claimed not to have been contacted by the LOG12 team to post a link to a survey, although 5 of them had been contacted (including 2 who engaged in correspondence), I saw some humor in this situation. In consequence, some blog posts I wrote at the time reflected this bemusement because I infused them with what I considered to be a humorous touch. I now regret having taken that stance because I soon realized that there was nothing funny about the toxicity of denial. I had under-estimated the brutality and thuggishness with which some individuals were to try to silence me and discredit my work for several years to come. To illustrate, one individual alone issued nearly 400 tweets that defamed me or disparaged my work during the 3 years in question, or about 1 every 72 hours. This is not counting a further 150 or so tweets by the same individual that related to *Recursive Fury*.

I have nonetheless, until recently, continued to try and engage in conversation with adversaries when circumstances appeared benign. To date, none of those attempts have been successful. To illustrate, when I received an email some years ago from an avowed “skeptic” that suggested “we open a private dialogue with the intention of trying to better understand each other”, I engaged by responding to the correspondent’s specific question with hints to the relevant literature. This was initially appreciated (“thanks that does look relevant”), and I was prepared to continue the conversation, notwithstanding my original misgivings. However, this constructive turn was soon followed by another email that stated “I had hoped to work toward a better understanding between us . . . it is clear to me that you have not adhered to the proper ethics of academia and science.” A few days later, the correspondent put this comment on his blog: “Lewandowsky is paid by big oil and conspires to make deniers fearful of suggesting that there is a conspiracy so we dare not mention this conspiracy to make us think there is another conspiracy to make us miss the real conspiracy that’s absent” (paraphrased slightly). This type of exchange is no isolated incident. I have been involved in several such abortive conversations over the years, and many climate scientists have reported similar experiences. For example, Eric Steig ruefully noted that “many of my colleagues warned me many times not to trust the good intentions of . . . [names of individuals also involved in the attack on LOG12]. I have ignored them, evidently to my peril” (Steig, 2011).

Now, 5 years after LOG12 first became available, I believe that I have achieved a resolution between a number of conflicting emotions. On the negative side, I regret having been forced to revise my formerly rather unrefined views about human nature and political behaviors. I also find that it takes continued effort not to become cynical about the state of our societies, which to date have permitted a small number of political operatives and bloggers who are accountable to no one to prevent meaningful climate policies aimed at preserving civilization for future generations.

On the more positive side, I feel more resilient and determined than ever before to continue my work in cognitive science and climate science. There is now mounting evidence that climate denial involves a conspiratorial component that differs from conventional coherent cognition (Lewandowsky, Cook, & Lloyd, 2016). This is not only of scholarly relevance, but it is also crucial for the public to understand who is opposing the scientific consensus and why (and how that opposition is using misleading rhetoric; Lewandowsky, Ballard, Oberauer, & Benestad, 2016). Finally, above all, I feel a deep gratitude to the numerous colleagues who have experienced similar attacks on their work, and who were thus able to provide support and understanding throughout. The vast majority of people in academia and beyond live their lives without being targeted by hate campaigns, and for them the effects of such campaigns are perhaps difficult to understand. However, no one is safe from becoming a target of vilification and hatred. In the U.K., a feminist journalist and blogger who (successfully) campaigned to have a woman featured on a new British banknote—about to be released, with a picture of Jane Austen—became inundated with hateful messages on social media, including threats of mutilation, beatings and worse. Two individuals ultimately faced criminal convictions over those threats (<https://www.theguardian.com/society/2014/jan/07/jane-austen-banknote-abusive-tweets-criado-perez>). Who would have thought, ahead of time, that the simple proposal to put a woman on a U.K. banknote would elicit this much abuse and hatred? The fact that no one is safe from hate campaigns renders the resilience of relevant institutions and communities all the more important. This resilience is, however, sometimes lacking or compromised.

At the level of the scientific community overall, there is little doubt that pressure from the tobacco industry has affected the course of medical research, if only by consuming massive amounts of scientists' time that could otherwise have been devoted to research (Landman & Glantz, 2009; Proctor, 2011). The tobacco industry's activities also delayed the translation of medical research into interventions and policies that could have saved lives by reducing smoking rates (Oreskes & Conway, 2010; Proctor, 2011).

There is also a growing body of literature which suggests that the aggressive efforts by climate deniers have adversely affected the communication and direction of climate research (Brysse, Oreskes, O'Reilly, & Oppenheimer, 2013; Freudenburg & Muselli, 2010; Lewandowsky, Oreskes, et al., 2015). To illustrate, I argued in a recent paper with colleagues (Lewandowsky, Oreskes, et al., 2015) that the public and subterranean activities of organized climate denial have "seeped" into the scientific community. Climate scientists have done an admirable job pursuing their science under great political pressure, and they have tirelessly rebutted pseudoscientific arguments against their work. Nonetheless, being human, scientists operate with the same cognitive apparatus and limitations as every other person. In consequence, scientists may take public positions that they would be less likely to take in the absence of outspoken public opposition. Thus, when scientists are repeatedly stereotyped in public as "alarmists", a predicted response would be for them to try to avoid seeming alarmist by downplaying the degree of threat from climate change.

Finally, at the institutional and political level, the consequences of these contrarian activities were perhaps best summarized by Robert Manne, one of Australia's leading public intellectuals, as:

trying to wound a supposed enemy by exploiting the rules governing liberal institutions, like universities and academic journals, with a blizzard of bewildering and remorseless

distortions, pedantry and pettifoggery that is almost impossible for normal people to follow let alone judge fairly.

I encountered the effects of such pedantry and pettifoggery on institutions and journals throughout. The sheer volume of information generated online or in complaints, much of it banal or trivial, made it impossible for most of the people involved—including important decision makers—to keep track of events. To illustrate, one FOI request that I had to respond to at UWA was for “a printout of the web server log or the blog database showing the precise time (hours and minutes) and date of publishing; and the relevant time zone to which each time refers, in relation to each of the following posts [list of posts].” (It might be worth recalling that this FOI request was part of a campaign to discredit research that had identified conspiracist discourse as a component of climate denial.)

In addition to creating a blizzard of confusion that blurred the distinction between reality and accusation, and between substantive issues and pedantry, the constant drumbeat of accusations of “bias” and “activism” against me and my colleagues had subtle but pernicious consequences. It became apparent to me that for some decision makers in this affair, scientific expertise ultimately became conflated with “bias” or “activism.” I recall conversations in which expert opinion was quickly dismissed with a phrase such as “but he is a climate scientist,” and I experienced conversations in which my presumed antagonism towards climate denial was cited as a troubling issue. If such antagonism were a disqualifying attribute, then no law-abiding citizens could be criminologists because they would presumably have some sense of “antagonism” towards criminals. To my knowledge, no such scrutiny was applied by decision makers to the motivations of the (non-expert) complainants, some of whom have a long track record of politically-motivated climate denial. I also do not recall too many mentions of academic freedom by anyone throughout this affair, even though the events described here go to the heart of academic freedom and freedom of expression.

I am not the only person to be concerned by those pernicious consequences of persistent politically-motivated attacks on scientists. Climate scientist Eric Steig noted a similar problem (Steig, 2011):

But you know what has given me the most pause? The fact that a number of my colleagues and many otherwise intelligent-seeming people still seem to treat these guys [referring to individuals also involved in the attacks on LOG12 and *Recursive Fury*] as legitimate, honest commenters, . . .

To those that still don't get this—and who continue to believe that these people can be trusted to present their scientific results honestly, and who continue to speculate that their may be truth in the allegations made over the years against [climate scientists] Mike Mann, Ben Santer, Phil Jones, Stephen Schneider, Andrew Weaver, Kevin Trenberth, Keith Briffa, Gavin Schmidt, Darrell Kaufmann, and many many others, just because they ‘read it on a blog somewhere’—I'd be happy to share with you some of the more, err, ‘colorful’, emails I've gotten from [name] and his coauthors.

If you still don't get it, then I have a suggestion for a classic short story you should read. It's called, *The Lottery*, by Shirley Jackson.

Likewise, owing to the same drumbeat of accusations and relentless approaches, it occasionally appeared to become difficult for decision makers to differentiate between offence

and true injury. I was repeatedly admonished that I “offended a lot of people” (actually only a few dozen out of tens of thousands of readers), as if that by itself implied wrongdoing or cause for concern. The French satirical magazine *Charlie Hebdo* routinely causes offence, perhaps preferentially among Muslims, but their right to do so is a cornerstone of Western democracy. Evolutionary biologists routinely offend Christian fundamentalists but that does not invalidate the fact that humans evolved. Likewise, if people are offended by my work on climate denial, this neither changes the results of my research (e.g., in Figure 2) nor its importance for the public who is being misled on what is arguably the most important issue facing civilization in the 21st century (Lewandowsky, Ballard, et al., 2016).

The triage between confected outrage, pedantry, and vexatious complaints on the one hand, and legitimate grievances and public engagement in science on the other, currently consumes considerable public funds. The development of appropriate institutional procedures and recognition of the consequences of complaints must therefore continue to attract research attention (e.g., Bourne et al., 2015). Particularly relevant here is the small but growing scientific literature on querulous complainants (e.g., Lester, Wilson, Griffin, & Mullen, 2004; Mullen & Lester, 2006). More research on these issues is urgently needed, as are improved procedures to safeguard scientists from attacks while upholding the public’s right to transparency.

Concluding Remarks

Science denial can kill. When denial becomes official government policy, the death toll can run in the hundreds of thousands, as in the case of South Africa under President Mbeki (Chigwedere, Seage, Gruskin, Lee, & Essex, 2008). Mbeki’s government refused to accept antiretroviral drugs to contain the AIDS epidemic, preferring instead to treat AIDS with garlic and beetroot. It has been estimated that more than 330,000 lives (or approximately 2.2 million person years) were needlessly lost because the South African government ignored consensus scientific opinion (Chigwedere et al., 2008). In the West, similar statistics can be cited in connection with depressed immunization rates arising from the activities of anti-vaccine movements (Gangarosa et al., 1998). And high-end estimates of the consequences of unmitigated climate change cite the possibility that 187 million people may be forcibly displaced globally, corresponding to more than 2% of the world’s population (Nicholls et al., 2011).

In light of the sometimes lethal track record of science denial, one might expect opprobrium to be reserved for those who deny or interfere with the public’s right to be adequately informed about risks such as AIDS or climate change. Paradoxically, however, it appears to be scientists whose research aims to inform the public of such risks who have been targeted, in public and behind closed doors, in the manner just described. I know of numerous colleagues who have been subjected to similar treatment, but I know of no instance in which bloggers or political operatives who engage in such activities have been held accountable.

What are we to do? What can we do to render science more transparent while keeping it resilient (Lewandowsky & Bishop, 2016)? On an earlier occasion I suggested (Lewandowsky, Mann, et al., 2013):

As in most cases of intimidation and bullying, we believe that daylight is the best disinfectant . . . Knowledge of the common techniques by which scientists are attacked, irrespective of their discipline and research area, is essential so that institutions can support their academics against attempts to thwart their academic freedom. This information is also essential to enable lawmakers to improve the balance between academic freedom and confidentiality of peer review on the one hand, and the public's right to access information on the other. Finally, this knowledge is particularly important for journal editors and professional organizations to muster the required resilience against illegitimate insertions into the scientific process.

At the time of this writing, those recommendations stand, although they may have lost some of their impact in light of the current state of public discourse in the U.S. and U.K. The words “post-truth” and “post-fact”, virtually unheard of before 2015, have exploded onto the media scene during the past 18 months. The concern that truth, evidence, and facts have lost traction in public discourse was amplified by independent fact checkers in 2016, who judged 70% of all statements made by Donald Trump on the campaign trail to be false or mostly false. Notably, Trump has referred to climate change as a “hoax” invented by the Chinese, and at the time of this writing, President Trump has announced the withdrawal of the United States from the Paris agreement on climate change, and his administration is suffused with people who deny climate change, to the point where Secretary of Energy Rick Perry's staff announced that he is “winning” his fight with climate scientists (<http://talkingpointsmemo.com/livewire/perry-energy-department-boost-climate-skeptic-column>). The “post-truth world” (Lewandowsky, Ecker, & Cook, 2017) and the “politics of debasement” (Ott, 2017), in which politicians celebrate their “win” over scientists rather than use science to design evidence-based policies, are in full swing at the time of this writing, to the point where scholars are expressing concern about the future of democracy in America (Mickey, Levitisky, & Way, 2017).

Daylight is still the best disinfectant, but at the time of this writing it must shine into increasingly darker places.

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