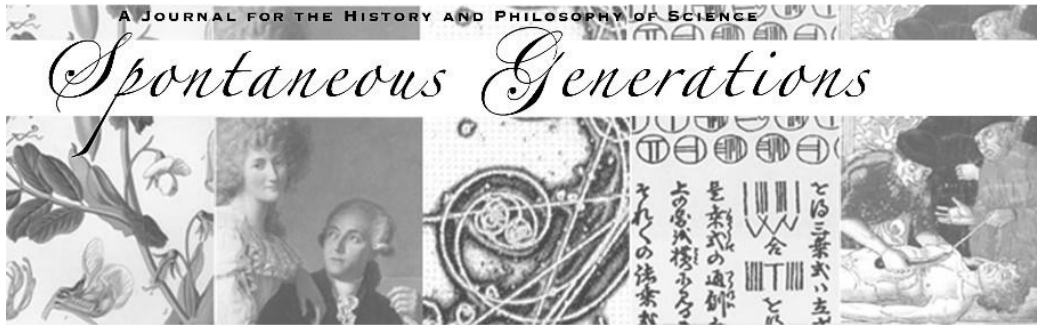




Between Pedantry and Populism: A Kantian Perspective on the Assault on Scientific Expertise

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Between Pedantry and Populism: A Kantian Perspective on the Assault on Scientific Expertise

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The Assault on Scientific Expertise

On 11 February 2020, the Center for Science and Democracy at the Union of Concerned Scientists put out a report titled *Endangering Generations: How the Trump Administration's Assault on Science Is Harming Children's Health*, detailing how, during Donald Trump's presidency, federal agencies had rolled back evidence-based environmental and health regulations, while at the same time cutting funding to a number of research centers, including those dedicated to pediatric health.¹ A day earlier, in his budget request to Congress, President Trump had demanded that more than US\$25 billion be assigned to NASA for fiscal year 2021 as part of his plan to put a man on the Moon (again) – an increase of more than 10% over the budget that had been approved the year before. As this juxtaposition illustrates, the Trump administration's much-lamented 'assault on science' was not a uniform attack on the whole of science, but targeted some disciplines more than others – notably those that were deemed at best irrelevant to national prestige, at worst a potential threat to free market capitalism.

Broadening the perspective both geographically and thematically, worries about funding cuts to politically inconvenient research programmes and politicized attacks on systems of scientific self-governance – be it attacks on the tenure system at public universities in the U.S. or political meddling with the National Academy of the Sciences in Hungary – fit with an overarching narrative, according to which the very notion of *scientific expertise* as the basis of superior (domain-specific) intellectual authority is currently under attack. Individual political actors are only part of the story, with a broader cultural anxiety about the influence and status of experts providing the backdrop against which such attacks must be understood. It is this diffuse discontent that Michael Gove, then the UK Justice Secretary, tapped into in June 2016, just before the Brexit referendum, when he proclaimed that 'the people in this country have had enough of experts' – though, tellingly, in a part of the same sentence which is usually omitted in quotation, Gove specifically referred to 'experts from organisations with acronyms saying that they know what is best and getting it consistently wrong.'² Clearly, then, cultural resentment of experts is interwoven with worries about individual autonomy, public accountability, and quite legitimate questions regarding the – sometimes mixed – track record of (putative) experts.

In his 2017 book *The Death of Expertise: The Campaign against Established Knowledge and Why it Matters*, Tom Nichols suggests that, while most ignorance can be overcome 'if people are willing to learn', '[n]othing, however, can overcome the toxic confluence of

¹ Union of Concerned Scientists *Endangering Generations: How the Trump Administration's Assault on Science Is Harming Children's Health* (Cambridge, Mass: Union of Concerned Scientists, 2020).

² "Gove: Britons 'Have Had Enough of Experts'". Interview with Faisal Islam," *Sky News*, June 3, 2016, YouTube, <https://www.youtube.com/watch?v=GGgiGtJk7MA&t=62s>

arrogance, narcissism, and cynicism that Americans now wear like full suit of armor against the efforts of experts and professionals.³ The stark dichotomy implicit in this statement carries over to his proposed solution (which is itself merely a re-description of the problem), namely the need to establish 'new ground rules for productive engagement between the educated elite and the society they serve.'⁴ Gil Eyal, in his somewhat less pessimistically titled 2019 book *The Crisis of Expertise*, rejects unilinear stories of decline, portraying the current crisis instead as a 'recursive, tangled process, where every attempt to check the vicious spiral ends up lending it momentum, yet the attacks designed to accelerate it often strangely land flat and have the opposite effect.'⁵ This suggests that the best way to address the growing gulf between 'the public' and 'the experts' is not by doubling down – let alone by a 'Revolt of the Experts.'⁶ – but by first acknowledging, *internally* as it were, the vulnerabilities that accompany any such attempt to communicate across real and perceived differences in epistemic authority and social status.

In the next two sections, I shall briefly address two such weaknesses and vulnerabilities, through the lens of two slogans that often accompany attempts to exploit them: the faux humility of 'I'm not a scientist, but...' (Section 2) and the seemingly enlightened exhortation to 'Do your own research!' (Section 3). Whereas the former trades on an implied parity between the subjective experiences of individuals and the collective results of science, the latter is based on the pretence that a single critical thinker can, through sheer determination and will power, always get to the truth of the matter, no matter how little training or background knowledge he or she has. Both of these attitudes chip away at the epistemic authority of legitimate scientific expertise, yet, as I show in Section 4, they are not without historical precedent. Drawing on statements by Immanuel Kant, I argue that those defending the possibility of legitimate scientific expertise against its detractors have long had to chart a course between the Scylla of scientific populism and the Charybdis of narrow-minded pedantry.

The Populism of "I'm not a scientist, but..."

On 8 October 1980, a few weeks before the U.S. presidential election, Ronald Reagan, who was then the Republican challenger to Democratic incumbent Jimmy Carter, shared the following insight concerning the natural environment with supporters at a rally in Ohio:

"I have flown twice over Mount St. Helens out on our West Coast. I'm not a scientist, and I don't know the figures, but I just have a suspicion that that one little mountain out there has probably released more sulfur dioxide into the atmosphere of the world than has been released in the last 10 years of automobile driving or things of that kind that people are so concerned about."⁷

Reagan was, of course, referring to the volcanic eruption of Mount St. Helens which began in March of the same year, and which scientists later estimated to have released about

³ Tom Nichols, *The Death of Expertise: The Campaign against Established Knowledge and Why it Matters* (Oxford: Oxford University Press, 2017): 234.

⁴ Ibid, 238.

⁵ Gil Eyal, *The Crisis of Expertise* (London: Polity, 2019): 111.

⁶ Nichols's term. See Nichols, *The Death of Expertise*, 234.

⁷ Cited after Dave Levitan, *Not a Scientist: How Politicians Mistake, Misrepresent, and Utterly Mangle Science* (New York: W.W. Norton, 2017): 1.

2 Mt of SO₂ over its whole duration (until well after Reagan's statement).⁸ By contrast, anthropogenic emissions of SO₂ that year in the U.S. alone amounted to about 25 Mt (though not exclusively from car traffic).⁹ So, on a generous interpretation, Reagan was off by about two orders of magnitude. Then again, Reagan did not lie – after all, he did not claim to have stated a fact, but only reported a hunch he (claims to have) had; indeed, he explicitly acknowledged that he was 'not a scientist' and 'didn't know the figures'. Yet there remains an air of disingenuousness about Reagan's statement – precisely because, by making an unwarranted comparison, it plays down a significant problem (air pollution by anthropogenic emissions), which he and his audience could easily have learnt about, had they turned to the (readily available!) scientific evidence at the time.

If Reagan did not tell a falsehood or lie, since he did not even make a factual assertion, just what kind of statement did he make? On the face of it he was not even expressing an opinion, but merely reporting what he calls a 'suspicion' – a hunch that can easily be recognized as objectively and subjectively insufficient for belief. Arguably, Reagan's statement can be subsumed under Harry Frankfurt's category of *bullshit*, where the latter, in essence, reflects a "lack of connection to a concern with truth – [an] indifference to how things really are."¹⁰ Whereas the liar aims to insert a specific false belief into his victim's belief system, the bullshitter does not aim to deceive us about specific facts, but about "what he is up to"¹¹ – and to this end, his rhetorical arsenal runs the gamut from merely evasive distractions, half-truths and the like to the sowing of unwarranted doubt in well-established facts and the imputing of hidden agendas to those with access to inconvenient truths. What bullshit lacks in terms of truthfulness, it more than makes up for with slick persuasiveness.

The Reagan quote nicely illustrates several of the mechanisms by which bullshitters manipulate their audience and nudge their hearers towards a certain view, without ever having to explicitly commit to a false assertion. By referencing the salient image of the erupting Mount St. Helens and pitting it against the (difficult to picture) total emissions of 10 years of automobile driving, Reagan plays to the (outdated but still popular) view that human actions always pale by comparison with Mother Nature – a move that is also familiar from climate sceptics who routinely misrepresent the influence of natural vs. anthropogenic climate forcings. That is, he succeeds in *plausibilizing* a particular – albeit, factually incorrect – view about the relative impact of natural vs. human sources of sulfur dioxide. The final step of forming the *belief* that things are indeed as speculated is conveniently left to the audience; while this doxastic transition is facilitated by the bullshitter by appealing to vivid imagery and playing to cognitive biases such as the familiarity heuristic, it is not something he takes responsibility for – after all, he explicitly acknowledged that he is 'not a scientist' and 'doesn't know the figures'.

A further rhetorical strategy is the use of a framing narrative based on personal, first-hand experience. Reagan, he tells his listeners, has 'flown twice over Mount St. Helens', witnessing how 'one little mountain out there' alone was spewing emissions into the atmosphere. He saw it *with his own eyes*. One can easily picture Reagan peering out of the window of a helicopter, taking in the scenery. When Harry Frankfurt declared that the

⁸ See T.M. Gerlach and K.A. McGee, "Total Sulfur Dioxide Emissions and Pre-Eruption Vapor-Saturated Magma at Mount St. Helens, 1980-88." *Geophysical Research Letters* 21 no. 25 (1994): 2833-2836.

⁹ Cf. Ian Tiseo, "Sulfur Dioxide Emissions in the U.S. 1970-2020," *Statista* (2021). <https://www.statista.com/statistics/501303/volume-of-sulfur-dioxide-emissions-us/>>, accessed 28 August 2021

¹⁰ Harry Frankfurt, "On Bullshit," in Harry Frankfurt, *The Importance of What We Care About: Philosophical Essays* (Cambridge: Cambridge University Press, 1988): 125.

¹¹ Ibid: 130.

bullshitter's 'focus is *panoramic* rather than particular'¹² he presumably was not referring to panoramic views from an aeroplane, but the strategy of privileging first-hand experience over established scientific facts reflects the same mindset as that of the bullshitter: it implies a parity between subjective appearances and scientific findings. And since subjective appearances – along with individual hunches, suspicions, and preferences – are not susceptible to falsification and external testing, they sidestep the issue of truth by evading intersubjective verification. Claiming that one's one-off observations are on a par with what scientists have established through their painstaking collective efforts, amounts at best to a parody of empiricism; at worst it slides into *epistemic populism*, in that it suggests to one's audience that this is a legitimate way of forming beliefs about scientific issues.¹³

David Levitan neatly sums up the mindset that underlies such populist usage of the locution 'I'm not a scientist', when he characterizes the phrase as 'a dodge, a bit of down-home hucksterism designed to marginalize those eggheads over there who actually are scientists as somehow out of touch or silly.'¹⁴

The pedantry of "Do your own research!"

Whereas the rhetoric of 'I'm not a scientist' aims to erase the epistemic asymmetry between experts and laypeople by implying that first-hand everyday experience deserves equal epistemic authority as scientific expert opinion, another frequently encountered rhetorical move is the exhortation to 'Do your own research!'. Unlike the former slogan, the demand to do one's own research is usually directed at non-experts – since even those who are self-professed 'skeptics' about certain scientific results are not denying that scientific experts *are* doing their own research; they just consider their research *bad* or *wrong-headed*. While the locution 'I'm not a scientist' reflects a faux humility, only to then discount the epistemic authority of science, the demand to 'do your own research' – often coupled with the Enlightenment command to 'think for yourself' – on the face of it acknowledges that there is added epistemic value to the systematic study of the world around us. Rather than taking our common sense experiences at face value, it allows for the very real possibility that appearances can be deceiving.

Because of its perceived link with the ideal of 'critical thinking', the slogan has become something of a catchphrase among those who would like to portray themselves as challenging orthodoxy – whether in science or politics. Some popular authors, often with a right-libertarian bent, promise to 'elevate you, the individual, to think for yourself and truly be free,'¹⁵ while others flatter their audience that, with a bit of individual research, anyone can see behind the façade of the scientific establishment. As an example of this attitude, consider this reply by Nathan Gill, the 2015 leader of the right-wing UK Independence Party in Wales, to BBC journalist Nick Servini who had confronted him with an earlier statement on the campaign trail that 'scientists will say whatever they are paid to say': 'And scientists, they flip flop more than any politician ever has. [...] Don't take anybody's word for it [...] Use your own common sense. We've got the wonderful resources of the internet. Get out there, do your own research, and think for yourself. [...] Don't take anyone's word for it. Go out

¹² Ibid: 130.

¹³ On the notion of 'epistemic populism', see Paul Saurette and Shane Gunser, "Ears Wide Shut: Epistemological Populism, Argutainment and Canadian Conservative Talk Radio." *Canadian Journal of Political Science* 44 no. 1 (2011): 195-218.

¹⁴ Levitan, *Not a Scientist*, 2.

¹⁵ Dave Rubin, *Don't Burn This Book: Thinking for Yourself in the Age of Unreason* (New York: Sentinel, 2020): 196.

there, find your own answers.’¹⁶

It certainly does not help, in this context, that the English word ‘research’ is ambiguous, in that it can refer both to the systematic, goal-oriented search for (already available) information and to the open-ended process of scientific investigation. Correspondingly, ‘to research’ a question can mean simply collating the material that has already been produced on a given topic, but it can also mean formulating novel hypotheses and holding them up to scrutiny.¹⁷ Put crudely, the former can be achieved (albeit imperfectly, to say the least) by a Google search; the latter requires background knowledge, experience and training in the relevant discipline. Conflating the two meanings, as anyone teaching in higher education can attest, leads to derivative and often biased results, especially when ‘doing research’ is (mis)understood as ‘finding evidence for’ a particular conclusion. ‘Research’, thus understood, turns into an open celebration of confirmation bias, and, when it takes as its sole input the opinions of others on the internet, may lead individuals ‘down the rabbit hole’. This is why even (or, perhaps, *especially*) conspiracy theorists endorse the ‘Do your own research’ mantra: it creates the illusion of understanding and, at every turn, makes for ‘an endless tease, always promising a new layer of revelation, or a new angle’ (as James Meek writes in the *London Review of Books*, in relation to the Q-Anon movement).¹⁸

Anyone familiar with how scientific research works knows that it is never possible to simply ‘do one’s own research’; instead, modern science as we know it is a communal enterprise, which relies on the contributions of many others. As John Hardwig noted in his classic paper on ‘The Role of Trust in Knowledge,’¹⁹ ‘modern knowers cannot be independent and self-reliant, not even in their own fields of specialization’, since ‘those who do not trust cannot have the best evidence for their beliefs.’ This only seems paradoxical to those unfamiliar with the degree of specialization characteristic of contemporary science and, correspondingly, the extent of division of epistemic labour, and with the foundational dialectic of collaboration and competition in science. To ‘never take anybody’s word for it’ and always ‘do one’s own research’ are maxims that are simply not compatible with the collective growth of scientific knowledge. Of course this does not mean that anyone should ‘trust blindly’, let alone that we should trust every scientific finding we encounter – this, too, would be an incoherent position to adopt. What is ruled out, however, is a stance that regards the in-principle openness to critical dissent (which, following Helen Longino, is a hallmark of science) as issuing in the power of any one individual to ‘veto’ what should count as good science.

If, as described in the previous section, the phrase ‘I am not a scientist’ is employed in order to prop up a fallacious pseudo-empiricism that privileges anecdotal first-hand experience over systematic scientific observation, then the phrase ‘Do your own research’ reflects a fallacious insistence on individual intellectual autonomy, marked by a lack of awareness of the limitations on what we can know entirely off our own bat. Whereas the former tends towards populism, the latter is the domain of pedantry – in the Kantian sense of an ‘affected thoroughness’ and ‘useless exactitude [...] in formalities.’²⁰ As such, it ‘consists

¹⁶ British Broadcasting Corporation, “Election 2015: Nick Servini Meets the Party Leaders. Nathan Gill Talks Immigration and Climate Change,” *BBC*, April 14, 2015 <https://www.bbc.com/news/election-2015-wales-32248634>

¹⁷ On the varied career of the term ‘research’, see Benoît Godin and Désirée Schauz, “The Changing Identity of Research: A Cultural and Conceptual History,” *History of Science* 54 no. 3 (2016): 276-303.

¹⁸ James Meek, “Red Pill, Blue Pill,” *London Review of Books* 24 no. 20 (2020): 23.

¹⁹ John Hardwig, “The Role of Trust in Knowledge,” *The Journal of Philosophy* 88 no. 12 (1991): 693-708.

²⁰ Immanuel Kant, *Kant’s Gesammelte Schriften*. Academy edition = AA. (Berlin: Verlag von Georg

in the fact that one has an inclination either to demonstrate everything or to accept nothing that is not demonstrated and proven undoubtedly.²¹ No wonder, then, that Kant refers to the pedant as the 'unfortunate imitation or *caricature* of the *methodical* mind' – someone who, by demanding proof beyond what can reasonably be expected, deprives himself of very real possibilities of learning.

Kant on the Dual Threat to Scientific Expertise

The realization that the collective growth of knowledge outstrips our individual abilities to keep up with new scientific results and developments, and that this makes us vulnerable in the ways in which we depend on others for knowledge, is not a recent phenomenon.²² As Kant put it with respect to the rapid increase in factual knowledge and scientific information, 'it is not the weight that burdens us, but it is the *volume*, that constricts the space of our knowledge.'²³ The adequate response is not, according to Kant, to simply gobble up as much information as we can (this, Kant argues, is the fallacy of the *polyhistor*, who only absorbs knowledge without an eye for its underlying organizational principles); rather, we need to cultivate a critical sensibility – a 'critique of reason, history, and historical writings' (and, presumably, of other factors contributing to the growth of knowledge) – which 'aims at human knowledge *en gros*, not merely *en detail*', in order to pare down the volume of knowledge 'without diminishing any of its content.'²⁴

The pedant who demands ever more argument and justification, even when evidence, background information, and context suffice for practical (though, in empirical matters, fallible) acceptance of a piece of information, lacks a proper orientation towards what matters in the world. In this regard, he contrasts with the 'man of the world' (*Weltmann*) and is 'a man of proficiency with respect to formalities only, not in accordance with its essence and purpose, [that is:] opposed to what is useful.'²⁵ The pedant's concerns, from his own point of view, may be entirely genuine; yet, his focus on 'useless exactitude in formalities' misses the point and has lost touch with a legitimate concern for 'thoroughness' [*Gründlichkeit*]). As a result, he fails to contribute to the growth of knowledge, since, at best, he trades in commonplaces clothed in abstract demands for rules.²⁶

Kant regards pedantry as a *déformation professionnelle* of scholars who mindlessly apply rules and methods, without realizing when these cease to be appropriate – because the world has changed, or because the subject matter they are commenting on does not lend itself to what they once learned in a different field. In this regard, his characterization of pedantry differs from our earlier discussion of the locution 'Do your own research', which reflects a more basic misunderstanding of scientific methods, typically (though not always) from non-scientists. Yet, the lack of world-orientation, and the failure to acknowledge when a tried and tested method (e.g., requesting additional evidence or argument) has ceased to

Reimer, Walter De Gruyter, 1900): AA 09: 46.

²¹ Immanuel Kant, *Lectures on Logic*, ed. and trans. by J. Michael Young (Cambridge: Cambridge University Press, 1992): 235.

²² Much of this section follows my earlier discussion in Axel Gelfert, "Kant and the Enlightenment's Contribution to Social Epistemology," *Episteme* 7 no. 1 (2010): 79-99.

²³ Kant, *Kant's Gesammelte Schriften*, Refl 1998, AA XVI: 189. All translations from the Academy edition (AA) of Kant's works are my own.

²⁴ Ibid.

²⁵ Kant, *Kant's Gesammelte Schriften*, Refl 2062, AA XVI: 217.

²⁶ Ibid: Refl 2049, AA XVI: 213.

be a useful tool (e.g., because no new evidence is likely to be forthcoming), are surely applicable to both cases.

Whereas the pedant, at least *formally*, pledges allegiance to the need for thorough investigation – even if he overshoots the mark, by not knowing when it is reasonable to regard a question as settled – the populist typically lacks *sincerity*, and in this regard resembles the figure of ‘the quack and the charlatan’. Now, Kant does not dismiss the goal of popularization *per se*, if this is properly understood as making oneself understood to a wider audience, in a way that is adequate to the subject matter at hand. A good informant, necessarily, is one that is able to provide information that is relevant and intelligible to the audience.²⁷ Yet, when superior knowledge is only simulated, that is: when an interlocutor arrogates to himself a degree of scientific competence and authority he in fact lacks, then this deserves our blame. There are no shortcuts to scientific expertise: those ‘apes of genius’ who, Kant says, declare ‘that difficult study and research are dilettantish and that they have snatched the spirit of science as a whole in a single grasp’ are ‘very detrimental to scientific and moral progress’, especially when they abuse their elevated position so as to pontificate ‘on religion, matters of the State and morals, like the illuminated occupants of the seat of wisdom’, only ‘to conceal [their] poverty of the spirit.’²⁸

Those who only mimic the hallmarks of expertise in order to free ride on such borrowed intellectual authority undermine the very basis of science as a social institution. In this, Kant recognizes, they can rely on the complicity of an audience that enjoys being flattered by the prospect of closing the epistemic gap with hard-working scientists, if only in its own perception. More often than not, as Kant writes in 1790, in a letter to a former student, the audience constitutes a ‘well-to-do caste [*vornehmer Stand*], who, if they do not actually claim superiority, at the very least they claim equality in their insights with those who must exert effort on the thorny path of learning.’²⁹ Together, such pseudoscientific snake oil salesmen and their receptive audiences collude ‘to render imperceptible the blatantly obvious inequality between loquacious ignorance and thorough science’. At the time, Kant was writing against the backdrop of the enthusiasms of his day, such as a growing demand for astrology, clairvoyance, religiously infused mysticism (as promulgated, e.g., by Emanuel Swedenborg), and similar fads. Yet, his description of the eagerness with which the proponents of such worldviews attempt to erase any epistemic asymmetry, no matter how well-earned and justified, between experts and laypersons, must sound eerily familiar to anyone who has encountered the dual rhetorical moves of ‘I’m not a scientist’ and ‘Do your own research’ in contemporary assaults on the notion of scientific expertise.

At the root of such attempts to discount the well-earned epistemic authority of those with specialist expertise, Kant speculates, is the desire to portray oneself as on a par with others. This is why proponents of alternative worldviews so often confront scientific experts with anecdotal evidence of seemingly inexplicable findings, no matter how far-fetched or off-topic. By attempting to demonstrate ignorance on the part of the scientific expert, even if it concerns an unrelated question, the appearance of epistemic parity is partially restored. Blurring the distinction between lofty speculation and thorough science is achieved by embellishing ‘intangible things, which can only be conceived of as an airy possibility, and presenting them as facts, and then demanding that the conscientious scientist should explain to him how he would explain the fulfilment of this or that dream, this intimation, astrological forecast, or transmutation of lead into gold’? Since acquiring expertise is hard work, the enthusiast attempts ‘an easier way to make the [epistemic] inequality disappear, namely by

²⁷ On this point, see Axel Gelfert, “Kant on Testimony,” *British Journal for the History of Philosophy* 14 no. 4 (2006): 627-652.

²⁸ Kant, *Kant’s Gesammelte Schriften*, AA VII: 226.

²⁹ Ibid: Br, AA XI: 141-143. The remaining quotations in this section all refer to this letter.

Axel Gelfert

changing track to things of which both know nothing'. If the scientist admits that, for lack of sufficient evidence, he has nothing to say about the alleged occurrences or phenomena, the enthusiast will conclude that 'one person is as ignorant as any other', and that 'he therefore has the freedom to make all sorts of judgments about things in which neither he nor his opponent can do any better'. Through this common 'sleight of hand', the enthusiast 'gives his ignorance the veneer of science', in effect disrespecting the epistemic authority of those who are in an objectively better position to know the facts.

Conclusion

Perhaps we can take solace in the fact that the crippled epistemologies that drive assaults on the epistemic authority of scientific experts are not an entirely novel phenomenon, but have a long history. The ever-accelerating growth of scientific knowledge, which makes it impossible for any one individual to grasp the whole of what is known, means that, by necessity, we have to defer to experts on many issues. Yet, the systems we have collectively devised for making such epistemic deference rational and justifiable, are inherently vulnerable.

In this paper, I have attempted to characterize two such vulnerabilities, which are summed up by the slogans 'I am not a scientist but...' and 'Do your own research'. Whereas the former implicitly asserts a false parity between the subjective convictions of individuals and the collectively established findings of science, the latter, while superficially endorsing the value of further inquiry, fails to realize that it requires skill and effort to do *good* research. Doing 'one's own research' as a novice in isolation from others (or actively distancing oneself from them) is almost always a non-starter. As Kant saw very clearly, merely going through the motions of 'doing research' in a purely formal manner gives rise to a form of pedantry, that is, a sterile and bloodless simulation of genuine, world-oriented scientific research. Simultaneously, the populist's intolerance towards very real epistemic asymmetries chips away at science from the outside, gradually eroding the very institution that those trying to give their ideas the 'veneer of science' free ride on.

How the current assaults on scientific expertise in our contemporary world will play out in the long run, is anyone's guess. But one thing seems clear: it will partly depend on whether those with a healthy, yet critically informed, respect for well-earned scientific expertise will be able to keep the pedants and populists in check.

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Axel Gelfert

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